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PROJECT “BEST”

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"ANALYSIS OF AGROBIODIVERSITY AND STUDY OF CULTIVATED SPECIES AT RISK OF EXTINCTION IN THE AREA OF PILOT ACTION 1 OF THE BEST PROJECT AND RELATED ACTION PLAN".

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Report on the activities implemented by the Local Action Group Sud Est Barese s.c.a r.l. with reference to art. 4 letter d) of the contract – terms of reference for carrying out activities:

- Action Plan, referred to at least 6 of the identified plant species, including production regulations drawn up and agreed on with the representatives of the reference Natural Parks and the farmers storing the seeds, pursuant to art. 1 point 2 lett. d)

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This document consists of 167 pages

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Summary

1 PREMISE

The action plan for the enhancement of agrobiodiversity of each pilot area of the BEST project is aimed at defining long-term strategies for sustainable management of crops in the areas subject to attention. The document, divided into three sub-levels relating to each area, is structured in such a way as to contain a fact-finding section and a proposal section. The first consists in the context analysis obtained through a synthesis of the investigation and analysis activities carried out in the context of activities 1.a, 1.b, 1.c. The proposal section, on the other hand, consists in the analysis of the socio-economic and environmental needs correlated to the conservation of agro -biodiversity , in the delineation of the strategic lines of action and in the preparation of the operational actions to be implemented in the aforementioned territories. This section derives from the setting achieved through activity 2.a) in which the essential elements that positively or negatively influence, from inside and outside the analysis system, the reintroduction and conservation of the individual varieties. The SWOT analysis carried out and re-proposed in the action plan relates to the protection/conservation of the single variety/species. Thanks to this, the following were evaluated: the intrinsic characteristics of the variety/cultivar analysed, the characteristics of the most widespread territory, the ability of the regional/local system to provide for their protection and conservation or even for productive exploitation, market evolutions and trends and preferences for the consumption of local and niche products, to the pressures deriving from urbanization and rationalization of production systems. The analysis thus contributes to evaluating the risk of genetic erosion from different perspectives, giving a complete picture of the emergencies and the levers to be used in formulating the Action Plan.

The operational part of the plan contains a section dedicated to the production regulations of agricultural species identified as being at risk of extinction. These specifications have been drawn up with a participatory approach in concert with local actors (citizens who hold vegetable resources, nurserymen, farmers, processors of agricultural products, associations,

technicians) and with the institutions interested in the conservation and enhancement of resources (municipalities, park, research centers). The involvement was coordinated directly by the proposer together with the referents of the reference Natural Parks of each area. The ability of the same to network between different territories, in particular those belonging to other LAGs of the Apulian territory, has made it possible to attract stakeholders able to participate in the meetings and give their contribution to the definition of the specifications. Furthermore, in the agri-food sector, the LAG promoted in 2020 the establishment of the South-East Barese Food District and various knowledge transfer initiatives as part of the 2014-2020 PSR measures. This made it possible to use its own communication channels to propose the initiatives implemented within this phase of the BEST project. These channels, already active for the promotion of local development interventions and of the Food District, have formed the basis for gathering adhesions to the meetings, in order to ensure a consistent involvement of local actors. The LAG structure provided the logistical-organizational support for the implementation of the moments of sharing while SINAGRI with the technical-scientific staff provided indications on the cultivation of vegetable resources with sustainable methods in order to establish a relationship with the local actors concerned and collect comments, considerations and any changes to the proposed specifications.

2 ACTION PLANS

The action plans prepared for each of the pilot areas of the BEST project are respectively constituted by a context analysis of the territories being analysed, by the SWOT of the agricultural varieties identified, by the delineation of strategic action lines and finally by the proposal of shared production regulations with the local actors involved in moments of animation and sharing of activities.

Methodological approach for the definition of strategic lines of action

For each of the identified species, risk scenarios are outlined connected to evaluation elements which from time to time will be identified starting from internal and external characteristics of the analysis system. Specifically, thanks also to the setting up of a SWOT analysis relating to the protection/conservation of the single agronomic species, the following are evaluated: the intrinsic characteristics of the variety/cultivar analysed, the characteristics of the most widespread territory, the capacity of the regional/local system of provide for their protection and conservation or even for productive exploitation, the evolution and trends of the market and the preferences of the consumption of local and niche products, the pressures deriving from urbanization and rationalization of production systems. The analysis thus contributes to evaluating the risk of genetic erosion from different perspectives, giving a complete picture of the emergencies and the levers to be used in formulating the Action Plan.

RGV		VARIETY NAME	RIPAGNOLA COAST	COASTAL DUNES	LITTLE SEA
HERBACEOUS	1	Purple Bean		x	
HERBACEOUS	2	San Pasquale durum wheat			x
HERBACEOUS	3	Bianchetta soft wheat	x	x	x
FORAGE	4	Underground trefoil	x		
FORAGE	5	Crimson clover	x		
FRUIT-FREE	6	Fig Petrelli	x	x	
FRUIT-FREE	7	Blue shark fig		x	x
FRUIT-FREE	8	But Gentile is real	x		x

FRUIT-FREE	9	But Recchia is false	x	x	
FRUIT-FREE	10	Plum S. Anna Oval		x	
VEGETABLES	11	White Artichoke of Taranto			x
VEGETABLES	12	Top of Cola	x		
VEGETABLES	13	Cowpea Occhiopinto	x		x
VEGETABLES	14	Pinto bean	x		
LIVES	15	Eyelash			x
LIVES	16	Notardomenico	x	x	
LIVES	17	St. Theresa			x

The SWOT analysis refers to both the maintenance and the reintroduction of the selected varieties in the three project areas. Referring to some brief methodological hints relating to the realization of a SWOT analysis, it should be remembered that the identification of the elements of analysis follows the two principles of the sign (positive or negative) and of the position (internal or external) of the element considered. Therefore, we will consider strengths and opportunities as positive elements coming respectively from inside and outside the analysis system. On the contrary, we will consider weaknesses and threats as negative elements coming respectively from inside and outside the analysis system. The system of analysis considered in this case has internal limits which can be identified in the characteristics of the varieties and in the capacity of the territory considered to host the type of crop in question. The external elements, on the other hand, can be traced back to aspects linked to the market, consumer trends, possible commercial relationships and climatic aspects or interactions with the urban fabric and the natural environment.

The creation of the SWOT is useful for identifying both the plausibility of a project for the recovery and maintenance of the varieties in question, and for identifying the enhancement levers which, depending on the origin, may or may not be controllable. Recovery projects will therefore be identified with a prevalence of positive, negative (neutral in case of equity) elements whose levers are controllable (internal to the system) or uncontrollable (majority of

levers external to the system). This method of analysis helps to formulate a judgment on **the valorisation scenario of** the variety considered.

The second purpose of the SWOT is to organize and systematize the elements of knowledge of the individual varieties in order to determine the degree of risk of genetic erosion. The table below represents the format used to determine the **risk of genetic erosion or extinction** .

The risk factors were estimated starting from some of the elements of the SWOT, making a score equal to 3, medium 2 and low 1 correspond to higher levels of risk. The sum of the scores obtained determines the degree of risk which can therefore be **low** when overall it is less than or equal to 9, medium when it is between 9 and 18, **high** when it is greater than 18.

Fattori di rischio Descrizione	Livello (grado) di rischio
1. Numero coltivatori	Maggiore di 30
	Compreso fra 10 e 30
	Minore di 10
2. Età media dei coltivatori	Minore di 40 anni
	Compreso fra 40 e 70 anni
	Maggiore di 70 anni
3.Superfici (% su superficie regionale del settore)	Superiore al 1%
	Compresa fra 0,1 e l'1%
	Inferiore a 0,1 % o superfici inferiori
	Piante isolate o coltivazioni in orti e giardini familiari
4. Distribuzione delle superfici coltivate e tipologie aziendali	Areali molto diversi, con diverse caratteristiche agro-climatiche
	Areali limitati, con stesse caratteristiche agro-climatiche e medesime tecniche colturali
	Stessa azienda/stesso areale/unica tecnica di coltivazione
5. Tipologia di mercato del prodotto	Mercati e/o cooperative di produttori Varietà principali in Indicazioni Geografiche (IG)
	Disponibile in piccole superfici a livello locale Varietà secondarie in IG
	Autoconsumo o a scopo di studio.

6. Ruolo dell'innovazione varietale	Assenza di varietà migliorate competitive con quella locale
	Persistenza della varietà locale solo per autoconsumo
	Rapida sostituzione varietà locale con varietà migliorate
7. Trend nuovi impianti	Presenza nuovi impianti
	Assenza nuovi impianti
8. Presenza dei Registri/Cataloghi nazionali	Frutticole: varietà presenti nelle liste varietali delle diverse regioni e varietà iscritte al Registro Nazionale delle Varietà
	Vite: vitigni iscritti all'albo regionale
	Orticole e piante agrarie: varietà iscritte al Registro Nazionale delle varietà da conservazione e/o prive di valore intrinseco
	Vite: in corso di iscrizione all'albo regionale Materiale disponibile presso pochi riproduttori e vivaisti
	Frutticole: varietà non inserite nelle liste varietali e non iscritte al Registro Nazionale delle Varietà
	Vite: vitigni non iscritti all'albo regionale
	Orticole e piante agrarie: non iscritte al Registro Nazionale delle Varietà da conservazione e/o prive di valore intrinseco
	Nessuna riproduzione per distribuzione extraziendale
9. Conservazione ex situ	Presenza di collezioni replicate almeno due volte
	Presenza di una sola collezione
	Assenza di collezioni

The last aspect taken into consideration for the definition of the strategic lines of action is represented by the sustainability of the cultivation of the single identified varieties. This aspect is an important element in the choice of production alternatives in particular areas such as protected ones. In fact, the protection and conservation requirements dictated by park management plans often collide with intensive agricultural production with a high environmental impact. Therefore, a general indication on the sustainability of the variety is included in order to assist park managers and agricultural operators in choosing the cultivation alternatives more in line with the protection strategies.

It must be taken into account that each variety identified is already in itself a valid alternative in terms of sustainability compared to commercial varieties. The elements that further detail and justify the assessment of sustainability derive mainly from the analysis of the intrinsic characteristics of the type of plant genetic resource as well as from the analysis of the specific morpho-physiological and productive peculiarities already highlighted in the SWOT. In fact,

these aspects may concern: greater resistance to adversity, with consequences on the reduction in the use of crop protection products; lower water needs, with direct effects relating to the reduction in the consumption of the resource; the greater rusticity, with effects on the use of fertilizers and on soil management through reduced cultivation operations.

Given the nature of the elements considered and the ways in which the information is treated, the purpose of this judgment is merely indicative as it does not make use of a scientifically rigorous approach (as would happen with the LCA for calculating the water footprint and carbon footprint , or in the presence of multi-parameter scoring models and multi - criteria analyses), but only of the synthetic and non-analytical aggregation of discontinuous information.

However, we want to give a general and non-exhaustive idea of the sustainability of the individual varieties analyzed for purely comparative purposes and internal to this work. The judgment is represented through a gradation of colors which indicates the general sustainability of the variety.

Representation of synthetic judgment	**Judgment on sustainability**
	low
	medium
	tall

2.1 ACTION PLAN FOR THE ENHANCEMENT OF THE AGROBIODIVERSITY OF THE COSTA RIPAGNOLA

2.1.1 Analysis of the agricultural context of the Costa Ripagnola Park

For the areas involved in the Costa Ripagnola Park being established , following field investigations, it is confirmed that the territories in question are basically arable, with the predominance of the varieties listed above, including the production of Senatore Cappelli durum wheat. It also confirms how the land is currently affected by the cultivation of forage and how much farmers have almost completely neglected the cultivation of vegetables if not inserting it in a cycle linked to the alternation of production in particular for smaller plots and for some plots close to the city of Monopoli and Polignano. Conversely, the lands south of Polignano a Mare and therefore located between the urban center of the latter and the city of Monopoli, have historically been affected by the production of cereals, fodder and also used for grazing.

The main territorial matrix of Costa Ripagnola is represented by the presence of the peri-urban and coastal agricultural mosaic which strongly characterizes the coastal rural landscape of the south of Bari. The climate, pedology and urbanization of the area have influenced the agricultural landscape and the selection of crops which have gradually come down to the present day.

Along the coast, the climate is typically Mediterranean with mild winters and hot, dry summers. In the area, there are dry spells in the summer. For the practice of agriculture, however, this drought does not imply major problems due to the rich underground aquifers fed by the runoff waters of the Murgia system. Irrigation is mainly used for the vineyards close to the area of interest.

The soils are generally deep, only in some cases limited in depth by the presence of crust. The texture is fine or moderately fine and skeleton absent or minimally present. The soils are

classified in the fourth class of use capacity due to the strong intrinsic limitations (in particular the poor water retention), such as to limit the choice of crops (IVs). They do not require particular conservation practices and allow for a wide choice of crops.

The tendency to merge coastal settlements strongly threatens the residual historical horticultural crops which, in addition to testifying to an important historical agricultural knowledge, have preserved the recognisability of coastal urban centres. Urban expansion has also partially affected the precious landscapes of the lame, both by disrupting the rural fabric that circumscribed them, and by physically occupying the lame themselves.

The rural landscape that overlooks the coast is often characterized by the presence of fruit and vegetable crops which alternate with uncultivated fields, natural pastures and arable land. To date, in non-irrigated arable land we find wheat, cereals and forage grown with traditional techniques, sown on hard soil or on plowed land. In the dry or irrigated vineyards often cultivated under PVC sheets (tents) there are almost exclusively table grapes of the usual commercial varieties such as Italia, Vittoria, Red globe or Crimson grapes. The permanent meadows and short stretches with shrubs are generally uncultivated with spontaneous herbaceous vegetation that alternates seasonally in a natural way. In some parts of the park, in addition to the predominance of natural pasture and arable land with forage and cereals, there are vineyards, fruit and fruit trees such as almond, cherry and peach trees. Agricultural productivity is on average high, intensive towards the coast with olive groves and vegetables. You often come across areas with orchards (olive, fig, cherry, apricot, peach and almond trees) associated with vegetables of all kinds, mainly brassicas, cucurbits, legumes and root and tuber vegetables. The gardens are mostly irrigated in the open field without coverage or with mobile temporary coverage structures. The prevalent olive cultivar is the "coratina", with trees of medium vigor and spreading habit, which produce an oil with excellent chemical characteristics. Also widespread is the " Ogliarola barese", otherwise known as "Cima di Bitonto", with medium-high vigor and expanded-assurgent habit, with average chemical

characteristics. The agronomic techniques currently used in the area are those of conventional agriculture for the cultivation of the aforementioned species.

In the Costa Ripagnola area, the first of the three bands that make up the Apulian agricultural landscapes with a trend parallel to the coast line is clearly legible. The first consists of the system of coastal and peri -coastal gardens which currently only partially overlook the sea and which represent openings in the buildings of Polignano and Monopoli. The coastal plain (from Cozze to Punta Bufaloria) which extends up to the Murgia escarpment is dominated by the landscape of centuries-old olive groves in the hinterland and by the landscapes of arable land associated with natural elements or the olive grove in the areas interspersed with the furrows of the blades in the territory coastal agriculture. The expanse of olive groves border the area of the park, the same that almost without interruption, starting from the coast, reaches the base of the Murgian plateau. On the other hand, near the park area, consistently with what happens throughout the south-east of Bari, the vineyard is predominantly added to the olive groves. Moving away from the coast line, this cultivation complex gives way to vineyards, locally associated with olive groves and orchards. Real monocultures of the vineyard are hardly found. The repercussions that industrialized and intensive agronomic techniques of tree cultivation have on the rural landscapes of the neighboring hinterland are important. In fact, the artificialization of this culture with greenhouses and plastic covers dominates the surrounding landscape. In particular, in fact, it is worth noting the large presence of table grape vineyards which extend from the hinterland of Mola to Polignano, cultivated with the use of polyethylene film in awning. We are witnessing a strong intensification in dry conditions and a more modest one in irrigation which has led to the transformation of the territories once cultivated with almond groves and olive groves into vineyards for table grapes.

The agricultural landscape was historically characterized on the coast by the presence of the irrigated vegetable garden, today unfortunately interrupted by the presence of the state road 16, consisting of a succession parallel to the coast of windbreak barriers placed close to high

dry-stone enclosure walls which generates a precise design which is superimposed on the system of the ancient systems for capturing groundwater, the norias, which are no longer usable today. The coastal strip has a variable thickness which decreases towards the south as far as Monopoli where the escarpment on which Conversano stands begins. The agricultural landscape is still characterized today by the grid of the irrigated garden which is still clearly legible, despite the strong impact due to the construction of the coastal flow axes. This system is characterized by a theory of roads perpendicular to the coast, known as " capodieci ", which divide the whole countryside in a regular way and which date back to the Angevin period. Here the farmers of the past undertook a continuous struggle to transform a largely sterile territory into fertile fields because it was stony, scarce in water resources and too close to the sea.

The result is a rural area characterized by a peculiar articulation of the agricultural mosaic and of the artefacts, built through the skilful use of the vegetation and constituted by a succession parallel to the coast of windbreak barriers (rows of olive or fig trees india, also alternating between them) placed close to high dry-stone enclosure walls. The felling of trees connected with the introduction of irrigated crops and awnings for table grapes, the enlargement of the Adriatic state road and the wild urbanization of the coast, have radically transformed the rural landscape of the coastal gardens of which only few fragments. The agro-ecosystem is sufficiently diversified and complex. Relevant value for the conservation of biodiversity is the extensive system of dry stone walls that separate the different crops,

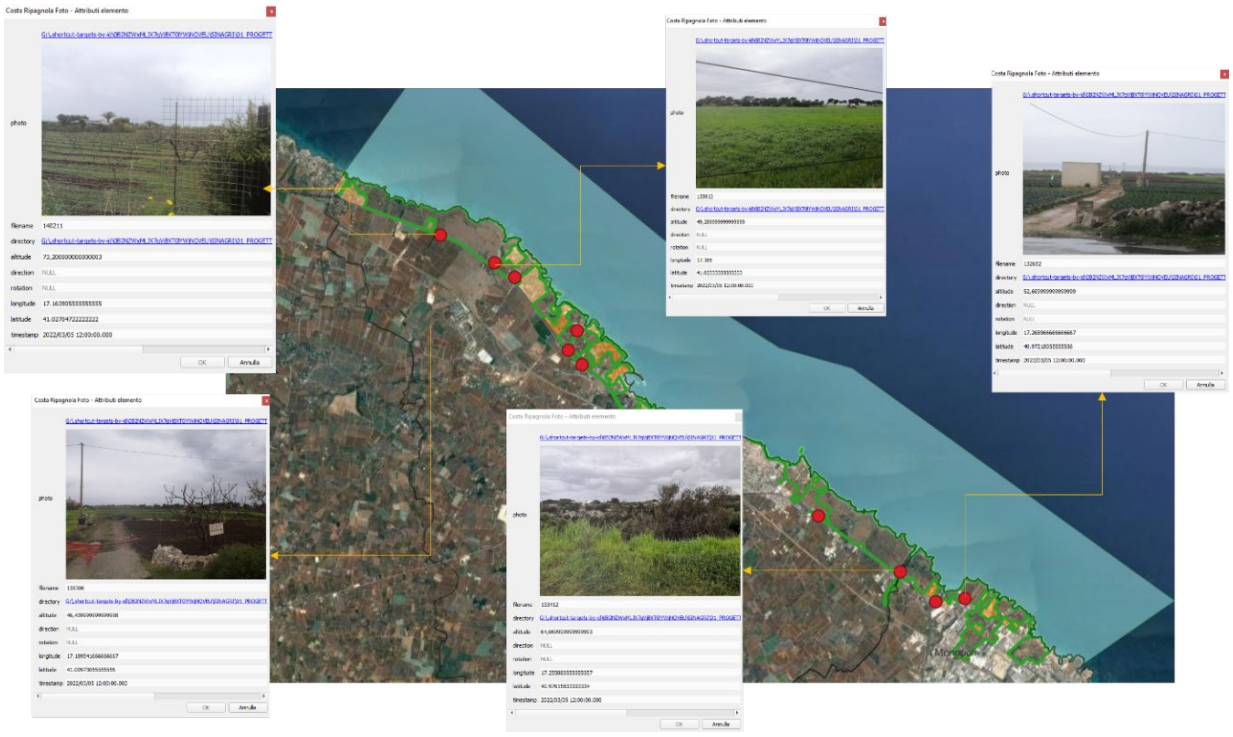

Figure 1Geotagged photographs taken during field surveys at Costa Ripagnola . Shooting points and photographic geodatabase cards .

Table 1List of varieties identified for the Costa Ripagnola area

ID code	RGV	Genetic resource
3	HERBACEOUS	Bianchetta soft wheat
4	FORAGE	Underground trefoil
5	FORAGE	Crimson clover
6	FRUIT-FREE	Fig Petrelli
8	FRUIT-FREE	But Gentile is real
9	FRUIT-FREE	But Recchia is false
12	VEGETABLES	Top of Cola
13	VEGETABLES	Cowpea Occhiopinto
14	VEGETABLES	Pinto bean
16	LIVES	Notardomenico lives

2.1.2 SWOT analysis of the varieties to be valorised in Costa Ripagnola

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
HERBACEOUS	3 Bianchetta soft wheat	x	x	x

Strengths	Points of weakness
✓ Variety already locally widespread in the past throughout Puglia and therefore adaptable to the three areas of the project. ✓ Cultivation associated with the preparation of typical dishes (grain of the dead, ciccecuotte , colva) ✓ Cultivation of Bianchetta also for use in the zootechnical field ✓ It adapts to cultivation both in the plains and in the hills, succeeds well with durum wheat and tolerated the grains. ✓ Data relating to the characters of wholemeal flours already detected and known: proteins, yellow index, brown index, gluten index, carotenoids, polyphenols. ✓ Vocation of the territory for the production of cereals and fodder	✓ Variety of wheat with low productivity Currently it is cultivated and stored only in public bodies. ✓ Typical productions valued and poorly integrated with the tourist offer ✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties. ✓ Data relating to the production characteristics detected and known only in part: production components and resistance to plant diseases
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage

SWOT scenario	**Recovery project with plausibly positive outcome. Enhancement consistently dependent on external elements of analysis.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**Tall**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
FORAGE	4 Underground trefoil	x		

Strengths	Points of weakness
✓ Forage variety traditionally grown in Puglia ✓ Vocation of the territory for the production of legumes/cereals and fodder ✓ Presence of three botanical varieties or subspecies with consequent greater amplitude of agro-climatic and soil tolerance ✓ It also grows well where it is difficult to operate quickly with mechanical means ✓ The underground clover adapts to all types of soil and, depending on the pH and the degree of humidity, it is possible to choose the most suitable subspecies for the particular edaphic situation. ✓ Strong and fast growing ✓ dense and compact turf suitable for grazing ✓ Due to its precious characteristic of self-seeding , this subspecies, if used well, becomes perennial and can be very useful for the improvement of the turf of natural pastures and arable land	✓ Strong geocarpism can make harvesting and grazing difficult ✓ Use for zootechnical purposes only
Chance	**Threats**
✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ It is subject to competition from commercial fodder selected for animal feed ✓ Very low number of growers ✓ Climate change that causes extreme weather events ✓ Wildlife damage

SWOT scenario	**Recovery project with plausibly positive outcome. A large number of internal elements of the analysis system can be leveraged.**
Risk degree of genetic erosion:	**23 - high risk**
Sustainability judgement	**tall**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
FORAGE	5 Crimson clover	x		

Strengths	Points of weakness
✓ Forage variety traditionally grown in Puglia ✓ Vocation of the territory for the production of legumes/cereals and fodder ✓ adapted to the Mediterranean climate, ✓ interesting production on loose and dry soils. ✓ palatable and digestible zootechnical food provided that the harvest is carried out with flowering plants.	✓ Use for zootechnical purposes only ✓ Late harvests can cause problems for the animals due to the many bristly hairs in the flower calyx
Chance	**Threats**
✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ It is subject to competition from commercial fodder selected for animal feed ✓ Very low number of growers ✓ Climate change that causes extreme weather events ✓ Wildlife damage

SWOT scenario	**Recovery project with uncertain outcome. A large number of internal elements of the analysis system can be leveraged.**
Risk degree of genetic erosion:	**24 - high risk**
Sustainability judgement	**tall**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
FRUIT-FREE	6 Fig Petrelli	x	x	

Strengths	Points of weakness
✓ Known variety, characterized and preserved in 3 research institutes ✓ Particularly widespread in Puglia, specifically in the project areas, where it represents a territorial specificity. ✓ Due to the intravarietal variability it is also possible to find particularly early clones.	✓ High intra-varietal variability makes it difficult to recognize unambiguously ✓ Very low number of growers ✓ Persistence of the local variety only for self -consumption ✓ Poor resistance to manipulations, especially by those supplied

✓ Presence of consolidated traditional techniques (inoleation , caprification, attraction of pollinators with ripe fruit) ✓ Interest of some young entrepreneurs for the start-up of the activity linked to the diffusion of the short supply chain of fresh products ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques ✓ High vigor of the plant ✓ High productivity ✓ Not particularly demanding plant ✓ Medium scale of maturation ✓ easy detachment of the fruit from the peduncle ✓ high juiciness and sweetness ✓ Resistant to drought and salty soils	✓ Local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors

SWOT scenario	**Recovery project with a plausibly positive outcome, however there are many external elements that influence the success of the valorisation process.**
Risk degree of genetic erosion:	**11 - medium risk**
Sustainability judgement	**medium**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
FRUIT-FREE	8 But Gentile is real	x		x

Strengths	Points of weakness
✓ Known variety, characterized and preserved in a research institute ✓ Particularly widespread in Puglia. Especially in the Bari and Taranto areas. ✓ Interest of some young entrepreneurs for starting the activity linked to the diffusion of the short supply chain of fresh and processed products (juice, puree, jam) ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques ✓ Appreciable organoleptic characteristics ✓ Fair agronomic characteristics ✓ It adapts to all regional pedoclimatic environments, rustic variety, ✓ moderately resistant to scab. ✓ good size,	✓ High productivity ✓ Very low number of growers ✓ A few isolated individuals of the variety ✓ Persistence of the local variety only for self-consumption and on the domestic market ✓ poor resistance to manipulation ✓ Local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors

SWOT scenario	**Recovery project with a plausibly positive outcome, however there are many external elements that influence the success of the valorisation process.**
Risk degree of genetic erosion:	**18 - medium risk**

Sustainability judgement	**medium**

RGV	**VARIETY NAME**	**C. RIPAGNOLA**	**COASTAL DUNES**	**LITTLE SEA**
FRUIT-FREE	**9 But Recchia is false**	**x**	**x**	

Strengths	**Points of weakness**
✓ Known variety, characterized and preserved in 2 research institutes ✓ Particularly widespread in Puglia: especially in the Bari and Taranto areas. ✓ mentioned among the best summer pears in the Region because it ripens in a period in which there are no foreign varieties on the market ✓ very precocious ✓ described as an excellent table variety. ✓ High productivity and discrete agronomic characteristics ✓ It adapts to all regional pedoclimatic environments, rustic variety, moderately resistant to scab ✓ Very good flavour, sweet, with a slightly acidic aftertaste. ✓ Suitable for fresh consumption, but also for transformation into juice, puree, jam (very sugary, in transformation it requires little sugar) ✓ Interest of some young entrepreneurs for starting the activity linked to the diffusion of the short supply chain of fresh and processed products (puree, jam) ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques	✓ Medium vigor ✓ The high intra-varietal variety makes univocal recognition difficult also due to the different cases of synonymy ✓ Very low number of growers ✓ A few isolated individuals of the variety ✓ Persistence of the local variety only for self-consumption and on the domestic market ✓ Local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution

✓ the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors
SWOT scenario	**Recovery project with a probably positive outcome and significant external elements capable of influencing the evolution of the valorisation process.**
Risk degree of genetic erosion:	**15 - medium risk**
Sustainability judgement	**medium**

RGV	**VARIETY NAME**	**C. RIPAGNOLA**	**COASTAL DUNES**	**LITTLE SEA**
VEGETABLES	**12 Top of Cola**	**x**		

Strengths	**Points of weakness**
✓ Variety preserved in a public institution ✓ Production associated with the preparation of typical dishes ✓ Vocation of the territory for the production of vegetables	✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties. ✓ Organoleptic characteristics not always appreciated (intense smell during cooking and spongy consistency)
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage
SWOT scenario	**Recovery project with uncertain outcome with external elements that condition the outcome of the valorisation process.**
Risk degree of genetic erosion:	**22 - high risk**
Sustainability judgement	**Bass**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
VEGETABLES	13 Cowpea Occhiopinto	x		x

Strengths	Points of weakness
✓ Variety preserved in a public institution. ✓ The pinto bean has been grown in Puglia since time immemorial and belongs to the agronomic tradition that adopts cultivation techniques consolidated over time and typical cultural references ✓ Possible reintroduction in two project areas. ✓ Vocation of the territory for the production of vegetables ✓ it is highly appreciated in Puglia and is used in recipes linked to the local tradition.	✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties. ✓ The citations found do not include precise territorial references. ✓ The production is medium-low.
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques. ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage ✓ Product characteristics do not seem sufficient for marketing with large-scale distribution.

SWOT scenario	**Recovery project with a basically positive outcome with external and internal elements capable of influencing the outcome of the valorisation process.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**low**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
VEGETABLES	14 Pinto bean	x		

Strengths	Points of weakness
✓ Variety preserved in a public body. ✓ Vocation of the territory for the production of vegetables ✓ present in Puglia since ancient times. ✓ Once widespread in the province of Bari and probably also in other Apulian provinces. ✓ Employed in traditional regional culinary preparations. ✓ it belongs to the agronomic tradition which adopts cultivation techniques consolidated over time and typical cultural references ✓ very rustic plant	✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties. ✓ Very rare today, it is grown almost exclusively in small plots of land or in family gardens. ✓ The citations relating to the variety do not include precise territorial references.
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques. ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage ✓ Product characteristics do not seem sufficient for marketing with large-scale distribution.

SWOT scenario	**Recovery project with a plausibly positive outcome, however the elements outside the analysis system have a high consistency, therefore capable of influencing the outcome of the valorisation process.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**low**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
LIVES	16 Notardomenico	x	x	

Strengths	Points of weakness
✓ Preserved at a research institution ✓ Wine variety tested with microvinification at company level. ✓ Possible reintroduction in two areas ✓ Present in the production disciplinary of the DOC Ostuni. ✓ Known technological characteristics: medium sugar content of the must; average total acidity of the must; low pH of the wort; ✓ high production of grapes per m ^{2} ✓ High fertility, both basal and distal, and productivity. ✓ it lends itself very well to obtaining a prestigious rosé wine ✓ if vinified in red it has good aromatic complexity with a prevalence of notes of ripe fruit	✓ Present since ancient times, with surfaces always rather modest ✓ Poor specialization of productions: widespread in old promiscuous vineyards ✓ often mixed with other white, red and black varieties therefore the varietal characters are not particularly recognizable today. ✓ High synonymy: present with other denominations in different wine-growing areas of the Puglia region ✓ Wine with a weak structure therefore not suitable for ageing ✓ local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Growing consumer interest in local and typical products ✓ Growing demand for products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Wildlife damage

SWOT scenario	**Recovery project with a basically positive outcome with negative elements that can be overcome thanks to enhancement levers within the analysis system.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**medium**

2.1.3 Strategic lines for Costa Ripagnola

of the risk and conservation analysis for the varieties identified in Costa Ripagnola .

Manageable valorisation path and high priority	POSITIVE SWOT SCENARIO HIGH RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
Bianchetta soft wheat	Test fields	Germplasm banks	
Underground trefoil	Test fields	Germplasm banks	
Cowpea Occhiopinto	Test fields	Germplasm banks	
Pinto bean	Test fields	Germplasm banks	
Notardomenico lives	Collection fields	Meristematic apex cryopreservation	

Uncertain valorisation path and high priority	UNCERTAIN SWOT SCENARIO HIGH RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
Crimson clover	Test fields	Germplasm banks	
Top of Cola	Test fields	Germplasm banks	

Manageable valuation path and medium priority	POSITIVE SWOT SCENARIO MEDIUM RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
Fig Petrelli	Collection fields	Meristematic apex cryopreservation	
But Gentile is real	Collection fields	Meristematic apex cryopreservation	
But Recchia is false	Collection fields	Meristematic apex cryopreservation	

2.1.4 Proposal of strategic actions

Synthetic judgments regarding the outcome of valorisation, the risk of genetic erosion and sustainability must be related to the territorial reality in which it is intended to valorise the varieties being analyzed in order to propose incisive and effective actions consistent with the needs of the territory. The Costa Ripagnola area is characterized by agricultural lands ranging from very large, for arable land, to extremely small for vegetables and tree crops. Furthermore, the production fabric is characterized by operators oriented towards self-consumption, short supply chains and in-company sales, but also aimed at more conventional commercial channels such as large-scale distribution, general markets and distributors. In some cases, there are activities involving the use and transformation of products on the farm (agritourism, restaurant and transformation activities). Furthermore, the companies benefit from a discreet relationship with the tourist activity of the area, given the proximity to historic centers and attractions of renowned national and international fame.

From a comparison with agricultural operators about the use of forgotten local varieties on the farm, some opinions about limits and advantages emerge.

Among the impediments to the use of agricultural product diversification through agrobiodiversity , the following points are mainly identified: lack of knowledge of the product and inexperience in specific cultivation techniques, fear that consumers and/or traders would not appreciate the product, production irregularities.

Among the advantages placed in agrobiodiversity are identified: the best organoleptic and nutritional characteristics of the proposed varieties; the possibility of attracting new consumers.

For each group of varieties included in the strategic lines, strategic objectives and possible applicable actions are highlighted. The varieties belonging to each group for which the actions can be used are highlighted in brackets.

Group 1: Manageable valorisation path and high priority

The goal for this group of varieties is to leverage the strengths and favorable characteristics to avoid the threat of genetic erosion and accelerate the process of economic exploitation in agriculture, focusing on crops that are more sustainable and profitable to attract new operators and increase the production base.

SHARES

- Incentive for the creation of protection consortia (all varieties).
- Information actions aimed at agricultural operators: conferences, workshops, living labs (all varieties)
- Incentive, in the form of a production premium, for custodian farmers who grow agrobiodiverse varieties (all varieties)
- Contribution on the cost of planting trees (Notardomenico vine)
- Information actions and seminars aimed at operators who use the genetic resource
    - agritourism facilities (Cowpea Occhiopinto , Fagiolino pinto)
    - restaurateurs (Cowpea Occhiopinto , Pinto bean)
    - hotel management schools (Cowpea Occhiopinto , Fagiolino pinto)
    - livestock farms (Underground Trefoil)
    - transformers (Bianchetta soft wheat, Notardomenico vine)
- Establishment of a farmer's market inside the park (Cowpea Occhiopinto , Fagiolino pinto)

Group 2. Uncertain valorisation path and high priority

The objective for this group of varieties is to prevent operational difficulties, limiting aspects and external threats from frustrating the producers' efforts to prevent the genetic resource from being dispersed.

SHARES

- Incentive, in the form of a production premium, for custodian farmers who grow agrobiodiverse varieties (all varieties)
- Monitoring actions: scientific studies to verify the valorisation conditions and production consistency (all varieties).
- Information actions aimed at agricultural operators: conferences, workshops, living labs (all varieties)
- Establishment of a farmer's market inside the park (Cima di Cola)

Group 3. Manageable valorisation path and medium priority

The objective for this group of varieties is to enhance the valorisation process in the downstream phase of production, to arouse greater interest in the resource and strengthen its strengths.

SHARES

- Information and promotional actions aimed at citizens, associations, schools, technicians, such as information, social and conventional campaigns, organization of traditional cooking courses (All varieties)
- Establishing awards and recognition for park farmers who produce landraces sustainably (all varieties)
- Establishment of parties, festivals and cultural events related to local productions (all varieties)
- Establishment of a farmer's market within the park (all varieties)

2.2 ACTION PLAN FOR THE ENHANCEMENT OF THE AGROBIODIVERSITY OF THE COASTAL DUNES

2.2.1 Analysis of the agricultural context of the Dune Costiere Park

In the perimeter of the Parco delle Dune Costiere and in particular on the land located upstream of the Strada Statale 379, that of cereals and fodder has always been a very common and widespread cultivation. Thanks also to the presence of numerous Masserias (Parco di Mare, Difesa di Malta, Masseria Gravinella , Masseria L'Ovile, Masseria Pezza Caldaia and Masseria Fontevecchia) sheep and goat breeding was very common, especially on land not particularly endowed with a good cultivation franc. In more recent times, the cultivation of fioroni and figs has found particular development to satisfy the need for products with a high energy value. This finds space above all on the coastal territorial front and upstream of the Statale 379 in the countryside of Fasano and not of Ostuni. Cotton cultivation is also recorded up until the first post-war period. The fiber obtained was used, among other things, to make the strings used to weave the bunches of tomatoes from Serbian (ramasole packed with tomato varieties of the Queen).

The territorial context of the Park is partly cultivated, partly uncultivated and inhabited by hygrophytic vegetation. In the background, imposing dunes dominate over which the Mediterranean maquis expands, interrupted at times by the artificial openings made by summer bathers. In this context, the climate, soil and urbanization due to the development of tourist settlements have influenced the agricultural landscape of the area and have contributed to the selection and permanence of only a few agricultural species. In the coastal stretch, the vegetation is now confined by the strong anthropization in an increasingly narrow strip.

The coast enclosed between the high Murge system and the Adriatic Sea has a typically Mediterranean climate with mild winters and hot summers. The depth of the soils varies

according to the area considered: moving from the hinterland towards the coast, we observe a change in the soils from thin or moderately deep, often limited in depth by the presence of crust, to deep or very deep, especially in areas of valley floor. These are certainly the most fertile areas of the subsystem where it is possible to cultivate any tree or herbaceous species, compatibly with climatic requirements. The coastal strip also boasts a rural landscape designed by a very dense system of blades. Along the coast, the agro-ecosystem is generally diversified and complex. With the exception of the imposing Murgian step, the natural elements are greatly reduced to the detriment of agriculture and urbanization. The agricultural areas are heterogeneous but above all olive groves, with persistent and often secular olive trees. The olive tree is often associated with the almond or carob tree or with herbaceous plants. Woody crops, mainly olive trees and vines, but also almond trees and other fruit trees, alternate with dry arable land, uncultivated or pastured areas, and bushy patches. Non-irrigated arable land is found both on the coast and in the innermost part of the park. Cereals and forages are mostly varieties commonly used in contemporary agriculture. The olive groves are dominated by the Cellina and Ogliarola varieties. There are also figs and fironi. Worth noting is the presence of the Fiorone di Torre Canne already known and used in the restaurants of the area.

In non-negligible areas of the coastal areas extensive forms of land exploitation are perpetuated and, even when one decides to bet on the olive tree, very large planting layouts (more than 14 meters) are common in the area, interspersed from time to time by olive groves reinvigorated with a more modern and intensive approach. The agricultural transformation here has produced a simplification of cultivation and a landscape in which the trees are "distant from each other, often distributed as in a wooded pasture", casually. The olive groves, in fact, are for the most part monumental in nature with very large planting layouts and the dimensions of both the trunks and the crown are quite exceptional. The vineyard, as a specialized crop, was concentrated above all along the lame, which deposited abundant layers of fertile red earth before flowing into coves and coastal inlets. At the same time, cereals and

forage crops alternated with high or intensive productivity proceeding along the coast. The highest income irrigated crops are located along the coast and are mostly fruit, with vegetables and olive groves. In the locality of Fiume Piccolo, between Torre Canne and Torre San Leonardo, as a natural interlude between pastures, arable land and arboretums, a body of water survives, also fed by a resurgence and connected to the sea by a small stream which, running parallel to the dunes, it ends up near the farm of the same name. The lake surface has significant dimensions; once used for fish farming, it is divided into two parts by an ancient wall, while significant colonies of juniper, Phoenician juniper, mastic, myrtle grow close to its banks. Especially in the innermost area, the comparison between the vegetation situation of the past and the plant species present today allows us to reconstruct the dynamics of the vegetation in the area: we have witnessed the progressive passage from the oak wood to the scrub due to human interventions; this degrading trend continued up to a gradual and irreversible reduction of the maquis to the advantage of olive groves and arable land.

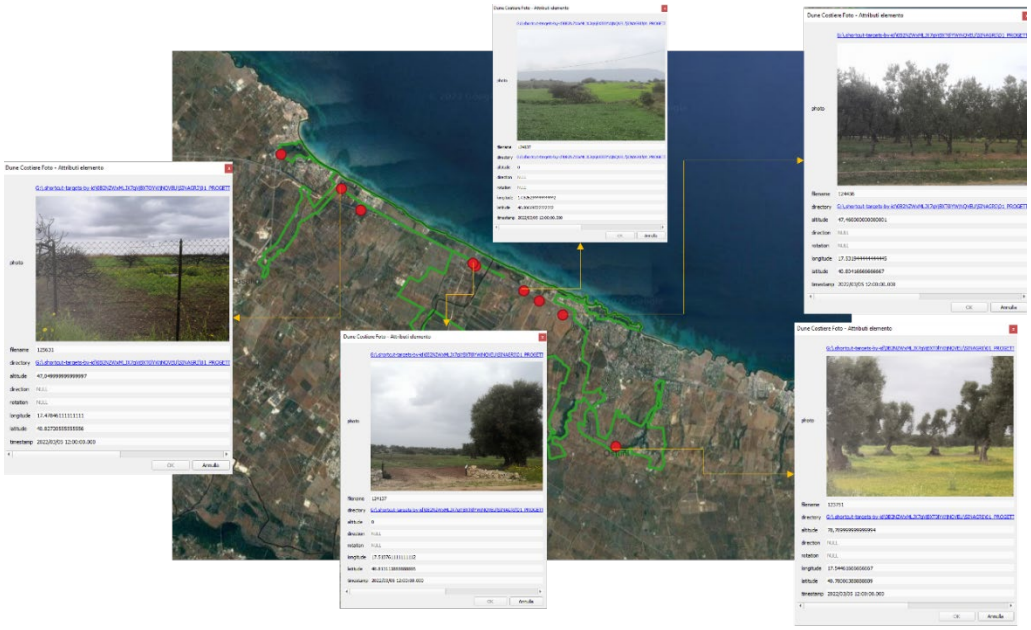

Figure 2Photographs with geotags taken during field surveys carried out in the Dune Costiere park. Shooting points and photographic geodatabase cards .

Table 2List of varieties identified for the Dune Costiere area

ID code	RGV	Genetic resource
1	HERBACEOUS	Purple Bean
3	HERBACEOUS	Bianchetta soft wheat
6	FRUIT-FREE	Fig Petrelli
7	FRUIT-FREE	Blue shark fig
9	FRUIT-FREE	But Recchia is false
10	FRUIT-FREE	Plum S. Anna Oval
16	LIVES	Notardomenico lives

2. 2.2 SWOT analysis of the varieties to be exploited in the Dune Costiere park

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
HERBACEOUS	1 Purple Bean		x	

Strengths	Points of weakness
✓ Appreciated for its organoleptic characteristics as it is more tender and tasty than the more common commercial varieties. ✓ Vocation of the territory for the production of legumes/cereals and fodder ✓ Interest of some young entrepreneurs for the start-up of the activity linked to the diffusion of the short supply chain ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques	✓ Low productivity compared to modern commercial varieties ✓ Very low number of growers ✓ Cultivated agricultural area with very low variety ✓ Persistence of the local variety only for self-consumption ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors
Chance	**Threats**
✓ Diversified tourist offer (seaside, rural, cultural, naturalistic tourism) ✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Consolidated experiences of tourism and sustainable agriculture in line with the protection of agro -biodiversity ✓ Typical dishes based on legumes ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution

SWOT scenario	**Recovery project with the possibility of success, however excessively influenced by external elements of analysis.**
Risk degree of genetic erosion:	**22 - high risk**

Sustainability judgement	low

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
HERBACEOUS	3 Bianchetta soft wheat	x	x	x

Strengths	Points of weakness
✓ Variety already locally widespread in the past throughout Puglia and therefore adaptable to the three areas of the project. ✓ Cultivation associated with the preparation of typical dishes (grain of the dead, ciccecuotte , colva) ✓ Cultivation of Bianchetta also for use in the zootechnical field ✓ It adapts to cultivation both in the plains and in the hills, succeeds well with durum wheat and tolerated the grains. ✓ Data relating to the characters of wholemeal flours already detected and known: proteins, yellow index, brown index, gluten index, carotenoids, polyphenols. ✓ Vocation of the territory for the production of cereals and fodder	✓ Variety of wheat with low productivity Currently it is cultivated and stored only in public institutions. ✓ Typical productions valued and poorly integrated with the tourist offer ✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties. ✓ Data relating to the production characteristics detected and known only in part: production components and resistance to plant diseases
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage

SWOT scenario	**Recovery project with plausibly positive outcome. Enhancement consistently dependent on external elements of analysis.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**tall**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
FRUIT-FREE	6 Fig Petrelli	x	x	

Strengths	Points of weakness
✓ Known variety, characterized and preserved in 3 research institutes ✓ Particularly widespread in Puglia, specifically in the project areas, where it represents a territorial specificity. ✓ Due to the intravarietal variability it is also possible to find particularly early clones. ✓ Presence of consolidated traditional techniques (inoleation , caprification, attraction of pollinators with ripe fruit) ✓ Interest of some young entrepreneurs for the start-up of the activity linked to the diffusion of the short supply chain of fresh products ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques ✓ High vigor of the plant ✓ High productivity ✓ Not particularly demanding plant ✓ Medium scale of maturation ✓ easy detachment of the fruit from the peduncle ✓ high juiciness and sweetness ✓ Resistant to drought and salty soils	✓ High intra-varietal variability makes it difficult to recognize unambiguously ✓ Very low number of growers ✓ Persistence of the local variety only for self-consumption ✓ Poor resistance to manipulations, especially by those supplied ✓ Local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for

valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	marketing with large-scale distribution ✓ productive sectors
SWOT scenario	**Recovery project with a plausibly positive outcome, however there are many external elements that influence the success of the valorisation process.**
Risk degree of genetic erosion:	**11 - medium risk**
Sustainability judgement	**medium**

RGV	**VARIETY NAME**	**C. RIPAGNOLA**	**COASTAL DUNES**	**LITTLE SEA**
FRUIT-FREE	**7 Blue shark fig**		**x**	**x**

Strengths	**Points of weakness**
✓ Known variety, characterized and preserved in 2 research institutes ✓ Particularly widespread in the province of Brindisi and Taranto, where it represents a territorial specificity. ✓ Interest of some young entrepreneurs for the start-up of the activity linked to the diffusion of the short supply chain of fresh and processed products (dried figs, fig jam) ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques ✓ High vigor ✓ Easy detachment of the peduncle ✓ Variety with a sour and aromatic taste, very pleasant, intense flavor and high juiciness and sweetness ✓ It has no particular agronomic needs. ✓ High resistance to manipulation.	✓ medium scale of maturation. ✓ Very low number of growers ✓ A few isolated individuals of the variety ✓ Persistence of the local variety only for self-consumption ✓ Poor resistance to manipulations, especially by those supplied ✓ Local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies	✓ Advanced age of entrepreneurs in the sector

with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors
SWOT scenario	**Recovery project with a plausibly positive outcome, however there are many external elements that influence the success of the valorisation process.**
Risk degree of genetic erosion:	**20 - high risk**
Sustainability judgement	**medium**

RGV	**VARIETY NAME**	**C. RIPAGNOLA**	**COASTAL DUNES**	**LITTLE SEA**
FRUIT-FREE	**9 But Recchia is false**	**x**	**x**	

Strengths	**Points of weakness**
✓ Known variety, characterized and preserved in 2 research institutes ✓ Particularly widespread in Puglia: especially in the Bari and Taranto areas. ✓ mentioned among the best summer pears in the Region because it ripens in a period in which there are no foreign varieties on the market ✓ very precocious ✓ described as an excellent table variety. ✓ High productivity and discrete agronomic characteristics ✓ It adapts to all regional pedoclimatic environments, rustic variety, moderately resistant to scab ✓ Very good flavour, sweet, with a slightly acidic aftertaste. ✓ Suitable for fresh consumption, but also for transformation into juice, puree, jam (very sugary, in transformation it requires little	✓ Medium vigor ✓ The high intra-varietal variety makes univocal recognition difficult also due to the different cases of synonymy ✓ Very low number of growers ✓ A few isolated individuals of the variety ✓ Persistence of the local variety only for self-consumption and on the domestic market ✓ Local nurseries not yet ready to produce plant material of local varieties

sugar) ✓ Interest of some young entrepreneurs for starting the activity linked to the diffusion of the short supply chain of fresh and processed products (puree, jam) ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques	
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors
SWOT scenario	**Recovery project with a probably positive outcome and significant external elements capable of influencing the evolution of the valorisation process.**
Risk degree of genetic erosion:	**15 - medium risk**
Sustainability judgement	**medium**

RGV	**VARIETY NAME**	**C. RIPAGNOLA**	**COASTAL DUNES**	**LITTLE SEA**
FRUIT-FREE	**10 Plum S. Anna Oval**		**x**	
Strengths		**Points of weakness**		
✓ Selected and stored in a public body ✓ Very ancient origin ✓ High productivity ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive,		✓ Very low number of growers ✓ A few isolated individuals of the variety ✓ Persistence of the local variety only for self-consumption and on the domestic market ✓ Medium resistance to manipulation. ✓ Local nurseries not yet ready to produce plant material of local varieties		

traditional techniques ✓ It has no particular agronomic needs. ✓ Variety with a sour and aromatic taste, very pleasant.	
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Interest of some young entrepreneurs for the start-up of the activity linked to the diffusion of the short supply chain ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors
SWOT scenario	**Recovery project with uncertain outcome, however there are many external elements that influence the success of the valorisation process.**
Risk degree of genetic erosion:	**23 - high risk**
Sustainability judgement	**medium**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
LIVES	16 Notardomenico	x	x	

Strengths	Points of weakness
✓ Preserved at a research institution ✓ Wine variety tested with microvinification at company level. ✓ Possible reintroduction in two areas ✓ Present in the production disciplinary of the DOC Ostuni. ✓ Known technological characteristics: medium sugar content of the must; average total acidity of the must; low pH of the wort; ✓ high production of grapes per m ^{2} ✓ High fertility, both basal and distal, and productivity. ✓ it lends itself very well to obtaining a prestigious rosé wine ✓ if vinified in red it has good aromatic complexity with a prevalence of notes of ripe fruit	✓ Present since ancient times, with surfaces always rather modest ✓ Poor specialization of productions: widespread in old promiscuous vineyards ✓ often mixed with other white, red and black varieties therefore the varietal characters are not particularly recognizable today. ✓ High synonymy: present with other denominations in different wine-growing areas of the Puglia region ✓ Wine with a weak structure therefore not suitable for ageing ✓ local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Growing consumer interest in local and typical products ✓ Growing demand for products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Wildlife damage

SWOT scenario	**Recovery project with a basically positive outcome with negative elements that can be overcome thanks to enhancement levers within the analysis system.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**medium**

2.2.3 Strategic lines for the Dune Costiere park

Summary results of the risk and conservation analysis for the varieties identified in the Parco delle Dune Costiere.

Manageable valorisation path and high priority	POSITIVE SWOT SCENARIO
	HIGH RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
Purple Bean	Test fields	Germplasm banks	
Bianchetta soft wheat	Test fields	Germplasm banks	
Blue shark fig	Collection fields	Meristematic apex cryopreservation	
Notardomenico lives	Collection fields	Meristematic apex cryopreservation	

Uncertain valorisation path and high priority	UNCERTAIN SWOT SCENARIO
	HIGH RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
Plum S. Anna Oval	Collection fields	Meristematic apex cryopreservation	

Manageable valuation path and medium priority	POSITIVE SWOT SCENARIO
	MEDIUM RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
Fig Petrelli	Collection fields	Meristematic apex cryopreservation	
But Recchia is false	Collection fields	Meristematic apex cryopreservation	

2.2.4 Proposal of strategic actions

Synthetic judgments regarding the outcome of valorisation, the risk of genetic erosion and sustainability must be related to the territorial reality in which it is intended to valorise the varieties being analyzed in order to propose incisive and effective actions consistent with the needs of the territory. The Coastal Dunes area is characterized by agricultural lands generally of medium-high extension especially for herbaceous crops (forage, wheat and legumes) and trees (olive, fig and carob trees). Furthermore, the production fabric is characterized by operators oriented towards self-consumption and organic production. Some of them adhere to PDO and PGI production regulations or diversify through agritourism activities. Many of the producers transform and sell the products directly on the farm, often linking the agricultural activity to the restaurant and accommodation business. Some producers turn to the wholesale commercial channel, allocating part of the production to the general markets. Furthermore, the companies benefit from a very high relationship with the tourist activity of the area, given the proximity to historical centers of national and international fame as well as the proximity to prestigious seaside areas. For some time now, the area has been trying to seasonally adjust the tourist offer. In fact, there is a consolidated presence of accommodation businesses, including farm holidays, open all year round and active in particular from April to November.

From a comparison with agricultural operators about the use of forgotten local varieties on the farm, some opinions about limits and advantages emerge.

Among the impediments to the use of agricultural product diversification through agrobiodiversity , the following points are mainly identified: inexperience on specific cultivation techniques, fear that distributors and traders would not withdraw the product. Some producers also show a fear of low productivity and lack of consumer interest

Among the advantages placed in agrobiodiversity , the opinion regarding the greater healthiness and safety of the product is mainly identified. Furthermore, some operators also

highlight other possible advantages, including: greater resistance to adversity, lower demand for inputs and water, resilience towards climate change, greater market performance for the attraction of new consumers and a higher selling price.

For each group of varieties included in the strategic lines, strategic objectives and possible applicable actions are highlighted. The varieties belonging to each group for which the actions can be used are highlighted in brackets.

Group 1: Manageable valorisation path and high priority

The goal for this group of varieties is to leverage the strengths and favorable characteristics to avoid the threat of genetic erosion and accelerate the process of economic exploitation in agriculture, focusing on crops that are more sustainable and profitable to attract new operators and increase the production base.

SHARES

- Incentive for the creation of protection consortia (all varieties).
- Information actions aimed at agricultural operators: conferences, workshops, living labs (all varieties)
- Incentive, in the form of a production premium, for custodian farmers who grow agrobiodiverse varieties (all varieties)
- Contribution on the cost of planting trees (Fico Verdesca, Vite Notardomenico)
- Information actions and seminars aimed at operators who use the genetic resource
    - agritourism facilities (purple bean, green fig)
    - restaurateurs (purple bean, green fig)
    - hotel management schools (purple bean, green fig)
    - transformers (Bianchetta soft wheat, Notardomenico vine, Green fig)
- Establishment of a farmer's market inside the park (purple bean, green fig)

Group 2. Uncertain valorisation path and high priority

The objective for this group of varieties is to prevent operational difficulties, limiting aspects and external threats from frustrating the producers' efforts to prevent the genetic resource from being dispersed.

SHARES

- Incentive, in the form of a production premium, for guardian farmers who cultivate

agro-biodiverse varieties (Susino S. Anna Ovale)

- Monitoring actions: scientific studies to verify the valorisation conditions and production consistency (Susino S. Anna Ovale).
- Information actions aimed at agricultural operators: conferences, workshops, living labs (Susino S. Anna Ovale)
- Establishment of a farmer's market inside the park (Susino S. Anna Ovale)

Group 3. Manageable valorisation path and medium priority

The objective for this group of varieties is to enhance the valorisation process in the downstream phase of production, to arouse greater interest in the resource and strengthen its strengths.

SHARES

- Information and promotional actions aimed at citizens, associations, schools, technicians, such as information, social and conventional campaigns, organization of traditional cooking courses (All varieties)
- Establishing awards and recognition for park farmers who produce landraces sustainably (all varieties)
- Establishment of parties, festivals and cultural events related to local productions (all varieties)
- Establishment of a farmer's market within the park (all varieties)

2.3 ACTION PLAN FOR THE ENHANCEMENT OF THE MAR PICCOLO AGROBIODIVERSITY

2.3.1 Analysis of the agricultural context of the Mar Piccolo Park of Taranto

The prevailing rural morphotype consists of arable land, olive groves and pastures, interspersed with frequent natural elements consisting of woods and bushes. In the area, the main pressures that have conditioned the current cultivated species and the use of agronomic technical currents are recognized in the soil and climatic conditions and in the industrial pressure of the neighboring areas. Below are some aspects of the climate and soil that have, over time, profoundly conditioned the choice of cultivated species, their distribution and the choice of the most suitable cultivation techniques to deal with these limitations. The climate is typically Mediterranean with mild winters and hot, dry summers. As far as wind is concerned, the Ionian Arc of Taranto does not suffer from major problems, as it is protected to the north by the Murgia system, which moderates the action of cold winds. Precipitation is scarce, in fact the annual value is below the regional average. The depth of the soils is extremely variable: in some areas, after a few centimeters of usable soil, the substrate is generally calcareous or pebbly, in other cases the depth is moderate, in still others the soils are very deep. Drainage is almost always optimal, rarely moderate. The texture changes considerably from coarse to moderately fine up to fine, with soils rich in inorganic colloids. A fundamental aspect concerns the presence of skeleton, absent or present in minimal quantities in some areas, abundant enough to make cultivation difficult in others. Surface stoniness is absent in some areas, abundant in others. Another serious problem of a pedological nature found along the shores of the Mar Piccolo is also represented by the reclamation of the salt steppes for cultivation and residential settlements.

The agricultural landscape begins to take shape in the Neolithic period, especially in the area where Taranto will later arise, in the areas around the Mar Piccolo, in the area immediately to the north-west of the city and throughout the south-eastern coast of the Ionian province, in places characterized by by soil fertility and ease of access to water sources, while the inland

areas were affected by these transformations only at a later time. Within them, pastoralism and breeding in general probably had a much greater weight than in the coastal sites, where cereal growing developed. The introduction of viticultural practices in Tarantino is probably due to the Spartan colonists who founded the Greek city. The great geomorphological variety of the area in question is reflected in a complex articulation of rural landscapes. There is an alternation of arable monocultures, characterized by variations of the plot which gradually becomes more dense as the slopes of the slopes increase, and by a series of agricultural mosaics and agro -forestry- pastoral mosaics near the karst incisions. The rural mosaic is interspersed with islands of pasture and new naturalness, with a barren and little artificial character . Agriculture in the area has progressively undergone substantial marginalization: the industrialization of the area (starting from the 1950s) has led to the disappearance of the system of farms and pastures in the area closest to Taranto. The historic natural and rural landscape has been systematically simplified and trivialized also through the creation of drainage channels, the cementing of river beds and banks and inappropriate hydraulic-forest arrangements upstream.

The predominant agricultural uses include dry and irrigated arable land and permanent crops which cover a large part of the surface. Permanent crops include vineyards, olive groves and orchards (mainly table grapes and citrus fruits).

In the territory, it is worth noting the permanence of the Mediterranean-type gardens (vegetable gardens), defined as horticultural lands of the Marshes of Tara, orchards and marsh lands, whose location was carefully chosen both in reference to the possibility of accessing the water resource, and to the soil quality and exposure. Given the continuous cycle of crops, to meet the need for water throughout the year, there were always storage structures in the gardens, such as wells and cisterns (aquariums and swimming pools). In some, where the water table was superficial, there were also complex water lifting systems (ingegne or noria). Where it grew spontaneously, a part of the garden was reserved for cane thicket (cannito), which in

addition to acting, in turn, as a hedge or protection, also supplied the raw material for a thousand other uses (from supporting horticultural plants and vines to housing construction). The space inside the garden, in particular that of the farms, was generally divided into functional sectors (quadrants) by means of passable paths, each of which had (in rotation) a particular cultural destination. Byzantines and Arabs decisively contributed to the subsequent development of the garden, introducing both techniques and new species, such as citrus fruits, apricots, date palms, mulberries, jujubes, irrigated melons and saffron, which soon became a characterizing element of the Mediterranean habitat. The agricultural plain of Taranto is characterized by the network of reclamation canals: to the west the shed vineyard dominates the agricultural mosaic, while towards the Barsento , on the eastern side, up to Taranto, citrus groves prevail. In more recent times, the intensive cultivation of orchards and vineyards have led to a strong artificialization and alteration of the traditional characteristics of the rural territory. The pervasiveness of the plastic roofing of tree crops, with the occasional presence of greenhouses, characterizes a landscape whose only discontinuities are the narrow and residual surfaces of the blades. Agriculture is intensive for citrus fruits and table vines. In fact, the use of irrigation is widespread and is conditioned by the choice of crops which ensure a high income under irrigation (citrus groves, vineyards and vegetables).

Along the shores of the two seas there are still several areas of high naturalistic value, also formed as a result of dynamics of spontaneous re-naturalization. Many of these areas are humid and the coast of the two seas is furrowed by the mouths of some short streams, fed by the internal karst resurgence system. The natural pasture formations attributable to Mediterranean pseudo -steppe habitats are extensive and widespread. The specific vegetation of this area is also expressed in the presence of numerous trans-Adriatic, endemic and rare species of biogeographical interest. Among the endemisms we note the orchids Oprhys tarantina, the Arum apulum , Anthemis hydruntina ; numerous rare or biogeographically relevant species, including Scrophularia Lucida, Campanula versicolor , Stipa austroitalica ,

Triticum uniaristatum , Asyneuma limonifolium , Salvia triloba, Phlomis fruticosa, Linum tomasinii , Paeonia mascula subsp. Mascula , Aubrieta columnae , Carum multiflorum , Biscutella incana , Helianthemum sessiflorum .

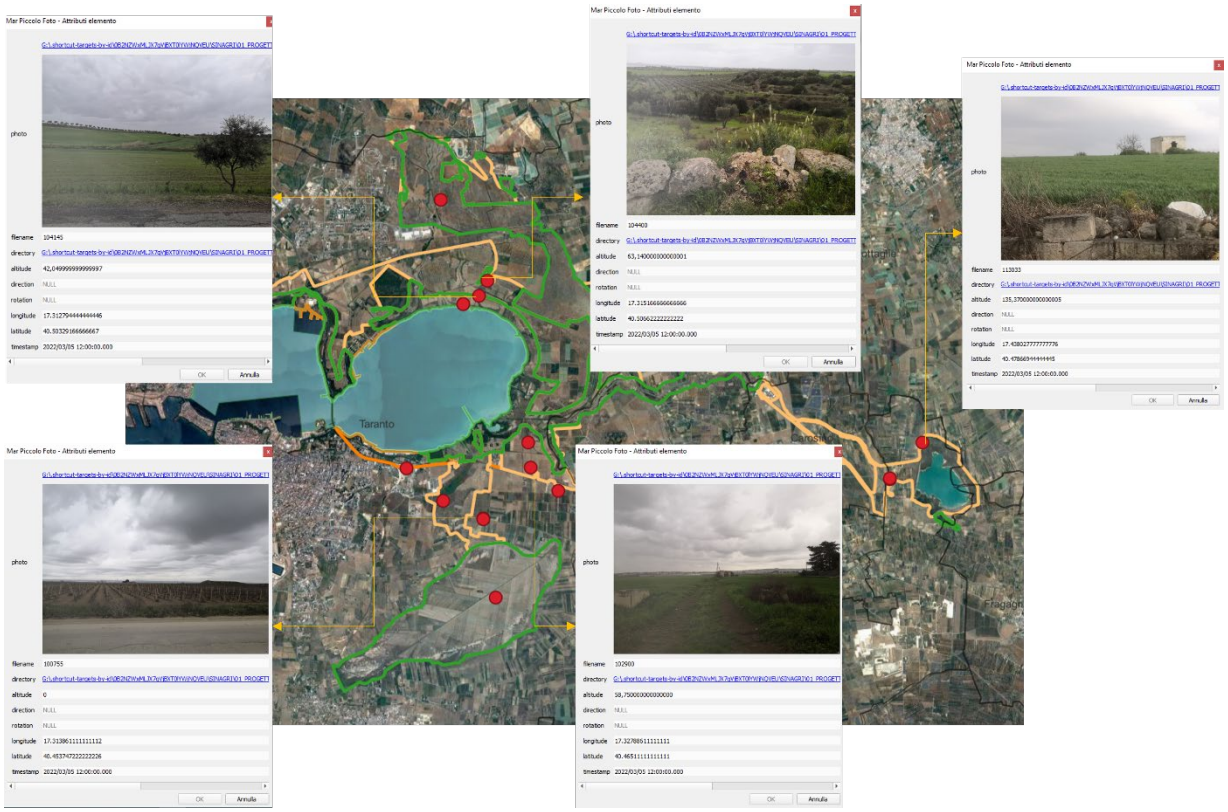

Figure 3Photographs with geotags taken during the field surveys carried out in the mar Piccolo park. Shooting points and photographic geodatabase cards .

Table 3List of varieties identified for the Mar Piccolo area

ID code	RGV	Genetic resource
2	HERBACEOUS	San Pasquale durum wheat
3	HERBACEOUS	Bianchetta soft wheat
7	FRUIT-FREE	Blue shark fig
8	FRUIT-FREE	But Gentile is real
11	VEGETABLES	White Artichoke of Taranto
13	VEGETABLES	Cowpea Occhiopinto
15	LIVES	Vine Cigliola
17	LIVES	Santa Teresa vine

The prevailing rural morphotype consists of arable land, olive groves and pastures, interspersed with frequent natural elements consisting of woods and bushes. In the area, the main pressures that have conditioned the current cultivated species and the use of agronomic technical currents are recognized in the soil and climatic conditions and in the industrial pressure of the neighboring areas. Below are some aspects of the climate and soil that have, over time, profoundly conditioned the choice of cultivated species, their distribution and the choice of the most suitable cultivation techniques to deal with these limitations. The climate is typically Mediterranean with mild winters and hot, dry summers. As far as wind is concerned, the Ionian Arc of Taranto does not suffer from major problems, as it is protected to the north by the Murgia system, which moderates the action of cold winds. Precipitation is scarce, in fact the annual value is below the regional average. The depth of the soils is extremely variable: in some areas, after a few centimeters of usable soil, the substrate is generally calcareous or pebbly, in other cases the depth is moderate, in still others the soils are very deep. Drainage is almost always optimal, rarely moderate. The texture changes considerably from coarse to moderately fine up to fine, with soils rich in inorganic colloids. A fundamental aspect concerns the presence of skeleton, absent or present in minimal quantities in some areas, abundant enough to make cultivation difficult in others. Surface stoniness is absent in some areas, abundant in others. Another serious problem of a pedological nature found along the shores of the Mar Piccolo is also represented by the reclamation of the salt steppes for cultivation and residential settlements.

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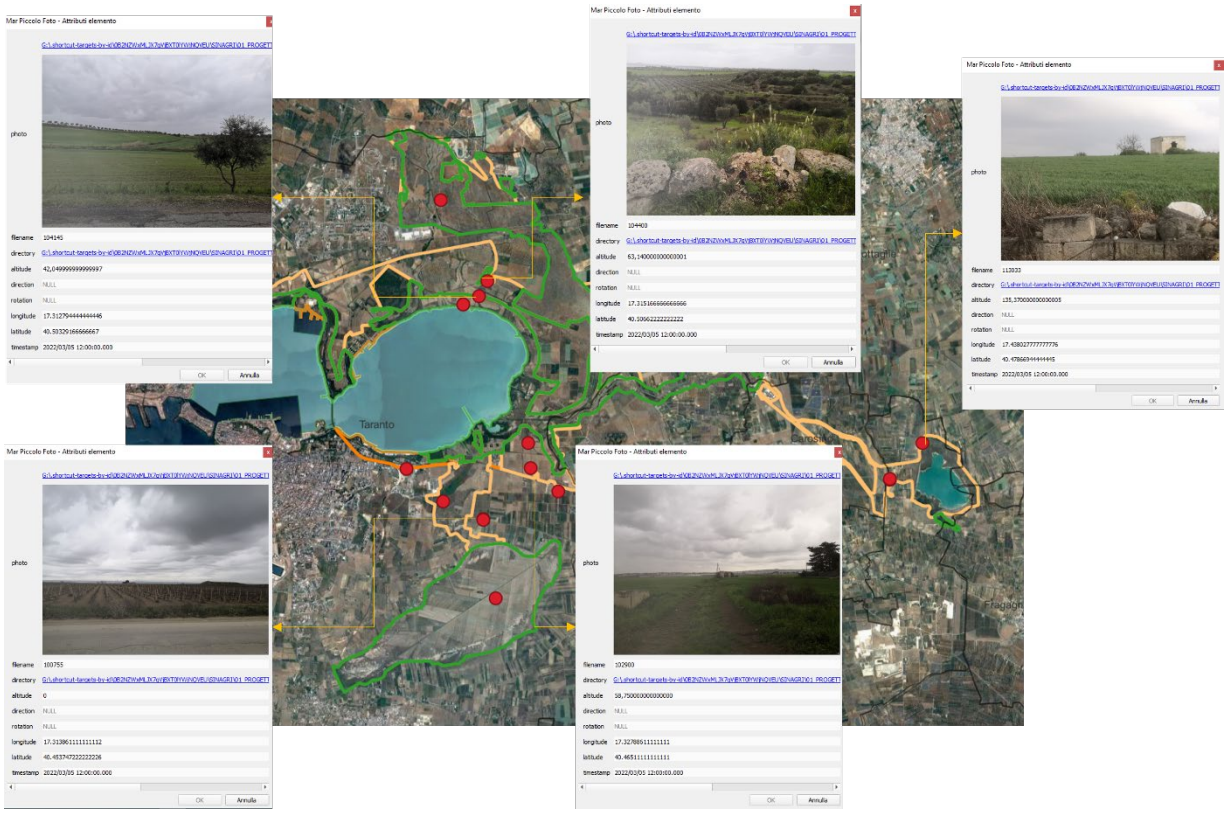

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17	LIVES	Santa Teresa vine

2.3.2 SWOT analysis of the varieties to be valorised in the Mar Piccolo park of Taranto

RGV		VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
HERBACEOUS	2	San Pasquale durum wheat			x

Strengths	Points of weakness
✓ Variety already locally widespread in the area in the past in the Ionian arc. ✓ In the past much appreciated for the production of pasta ✓ Data relating to the characters of wholemeal flours already detected and known: proteins, yellow index, brown index, gluten index, carotenoids, polyphenols. ✓ Vocation of the territory for the production of cereals and fodder	✓ Wheat varieties with low productivity ✓ Currently it is cultivated and preserved only in public institutions. ✓ Typical productions valued and poorly integrated with the tourist offer ✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties.
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage

SWOT scenario	**Recovery project uncertain due to a neutrality of the elements under analysis. Controlling the enhancement levers can be difficult due to the large number of external ones.**
Risk degree of genetic erosion:	**23 - high risk**
Sustainability judgement	**tall**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
HERBACEOUS	3 Bianchetta soft wheat	x	x	x

Strengths	Points of weakness
✓ Variety already locally widespread in the past throughout Puglia and therefore adaptable to the three areas of the project. ✓ Cultivation associated with the preparation of typical dishes (grain of the dead, ciccecuotte , colva) ✓ Cultivation of Bianchetta also for use in the zootechnical field ✓ It adapts to cultivation both in the plains and in the hills, succeeds well with durum wheat and tolerated the grains. ✓ Data relating to the characters of wholemeal flours already detected and known: proteins, yellow index, brown index, gluten index, carotenoids, polyphenols. ✓ Vocation of the territory for the production of cereals and fodder	✓ Variety of wheat with low productivity Currently it is cultivated and stored only in public bodies. ✓ Typical productions valued and poorly integrated with the tourist offer ✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties. ✓ Data relating to the production characteristics detected and known only in part: production components and resistance to plant diseases
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage

SWOT scenario	**Recovery project with plausibly positive outcome. Enhancement consistently dependent on external elements of analysis.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**tall**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
FRUIT-FREE	7 Blue shark fig		x	x

Strengths	Points of weakness
✓ Known variety, characterized and preserved in 2 research institutes ✓ Particularly widespread in the province of Brindisi and Taranto, where it represents a territorial specificity. ✓ Interest of some young entrepreneurs for the start-up of the activity linked to the diffusion of the short supply chain of fresh and processed products (dried figs, fig jam) ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques ✓ High vigor ✓ Easy detachment of the peduncle ✓ Variety with a sour and aromatic taste, very pleasant, intense flavor and high juiciness and sweetness ✓ It has no particular agronomic needs. ✓ High resistance to manipulation.	✓ medium scale of maturation. ✓ Very low number of growers ✓ A few isolated individuals of the variety ✓ Persistence of the local variety only for self-consumption ✓ Poor resistance to manipulations, especially by those supplied ✓ Local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors

SWOT scenario	**Recovery project with a plausibly positive outcome, however there are many external elements that influence the success of the valorisation process.**
Risk degree of genetic erosion:	**20 - high risk**
Sustainability judgement	**medium**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
FRUIT-FREE	8 But Gentile is real	x		x

Strengths	Points of weakness
✓ Known variety, characterized and preserved in a research institute ✓ Particularly widespread in Puglia. Especially in the Bari and Taranto areas. ✓ Interest of some young entrepreneurs for starting the activity linked to the diffusion of the short supply chain of fresh and processed products (juice, puree, jam) ✓ Supply chain companies capable of enhancing small quantities in niche segments ✓ Peasant agriculture, non-intensive, traditional techniques ✓ Appreciable organoleptic characteristics ✓ Fair agronomic characteristics ✓ It adapts to all regional pedoclimatic environments, rustic variety, ✓ moderately resistant to scab. ✓ good size,	✓ High productivity ✓ Very low number of growers ✓ A few isolated individuals of the variety ✓ Persistence of the local variety only for self-consumption and on the internal market ✓ poor resistance to manipulation ✓ Local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Development of forms of marketing of short supply chain ✓ Growing consumer interest in local and typical products ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin ✓ Diversified tourist offer in the area of possible cultivation (seaside, rural, cultural, naturalistic tourism)	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Fruit and vegetable market with high fluctuations ✓ Wildlife damage ✓ Product characteristics not sufficient for marketing with large-scale distribution ✓ Scarce vocation for the diversification of productions and scarce integration between productive sectors

SWOT scenario	**Recovery project with a plausibly positive outcome, however there are many external elements that influence the success of the valorisation process.**
Risk degree of genetic erosion:	**18 - medium risk**
Sustainability judgement	**medium**

RGV	**VARIETY NAME**	**C. RIPAGNOLA**	**COASTAL DUNES**	**LITTLE SEA**
VEGETABLES	**11 White Artichoke of Taranto**			**x**

Strengths	**Points of weakness**
✓ Variety preserved in 2 public institutions ✓ techniques and methods of cultivation, planting and multiplication of the artichoke field, fertilization and genetic improvement already known and reported in the literature. ✓ Productivity greater than 3 years ✓ Variety now not very present in the Taranto area	✓ Ancient variety of artichoke grown only sporadically in the gardens of the province of Taranto ✓ Not remarkable for the content of antioxidant compounds compared to other Apulian local varieties. ✓ Typical productions valued and poorly integrated with the tourist offer ✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties.
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques.	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage

SWOT scenario	**Recovery project with uncertain outcome, mainly dictated by internal weaknesses and a large number of external elements of uncertainty.**
Risk degree of genetic erosion:	**25 - high risk**
Sustainability judgement	**low**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
VEGETABLES	13 Cowpea Occhiopinto	x		x

Strengths	Points of weakness
✓ Variety preserved in a public institution. ✓ The pinto bean has been grown in Puglia since time immemorial and belongs to the agronomic tradition that adopts cultivation techniques consolidated over time and typical cultural references ✓ Possible reintroduction in two project areas. ✓ Vocation of the territory for the production of vegetables ✓ it is highly appreciated in Puglia and is used in recipes linked to the local tradition.	✓ Aging of the agricultural entrepreneurial fabric little accustomed to innovation and the recovery of ancient varieties. ✓ The citations found do not include precise territorial references. ✓ The production is medium-low.
Chance	**Threats**
✓ Growing consumer interest in local and typical products ✓ Good propensity of young people to work in the agricultural and artisanal sectors. ✓ Strong presence of structures and companies for the transformation of agro-food products ✓ Presence of non-intensive peasant agriculture and traditional techniques. ✓ Interest of the GDO for the supply and/or valorisation of local products ✓ Growing demand for food products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Abandonment of campaigns ✓ Wildlife damage ✓ Product characteristics do not seem sufficient for marketing with large-scale distribution.

SWOT scenario	**Recovery project with a basically positive outcome with external and internal elements capable of influencing the outcome of the valorisation process.**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**low**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
LIVES	15 Eyelash			x

Strengths	Points of weakness
✓ Preserved at a research institution ✓ characterized by early phenological phases, starting from budding; ✓ the phases of flowering, veraison and finally maturation take place in an early period. ✓ Productivity is regular and constant, good fertility. ✓ it lends itself very well as a base for table wines ✓ Wine with an olfactory profile characterized by moderate intensity especially for the floral and herbaceous notes ✓ good alcohol content and structure are accompanied by an excellent balance and persistence on the palate	✓ Various cases of synonymy in the different regional areas make the name of the variety little known ✓ Company-scale vinification not yet tested. ✓ local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Growing consumer interest in local and typical products ✓ Growing demand for products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Wildlife damage

SWOT scenario	**Recovery project with a plausibly positive outcome with the possible involvement of positive internal levers to influence the success of the valorisation**
Risk degree of genetic erosion:	**19 - high risk**
Sustainability judgement	**medium**

RGV	VARIETY NAME	C. RIPAGNOLA	COASTAL DUNES	LITTLE SEA
LIVES	17 St. Theresa			x

Strengths	Points of weakness
✓ Preserved at a research institution ✓ Variety that in the past "accompanied" the primitive in the vineyards of Taranto. ✓ high vigor of the branch ✓ high production of grapes per m ^{2} ✓ Already known technological characteristics of the must: low sugar content of the must; average total acidity of the must; average pH value of the wort ✓ Good fertility, both basal and distal, and productivity ✓ With a fairly contained alcohol content, it reveals a good total acidity content: the right balance between the acid flavor and a moderate fullness of the body	✓ ripening of the grapes, quite late therefore the risk of fog and excess water etc. increases. ✓ slightly poor structure of the wine ✓ local nurseries not yet ready to produce plant material of local varieties
Chance	**Threats**
✓ Connection of manufacturing companies with tourism activities in an area where the sector is developed and relevant ✓ Growing consumer interest in local and typical products ✓ Growing demand for products linked to the territories of origin	✓ Advanced age of entrepreneurs in the sector and insufficient interest from young people ✓ Climate change that causes extreme weather events ✓ Wildlife damage

SWOT scenario	**Recovery project with probably positive outcome with numerous elements on which to leverage for valorisation.**
Risk degree of genetic erosion:	**20 - high risk**
Sustainability judgement	**medium**

2.3.3 Strategic guidelines for the Mar Piccolo park in Taranto

Summary results of the risk and conservation analysis for the varieties identified in the Mar Piccolo park of Taranto.

Manageable valorisation path and high priority	POSITIVE SWOT SCENARIO
	HIGH RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
Bianchetta soft wheat	Test fields	Germplasm banks	
Blue shark fig	Collection fields	Meristematic apex cryopreservation	
Cowpea Occhiopinto	Test fields	Germplasm banks	
Vine Cigliola	Collection fields	Meristematic apex cryopreservation	
Santa Teresa vine	Collection fields	Meristematic apex cryopreservation	

Uncertain valorisation path and high priority	UNCERTAIN SWOT SCENARIO
	HIGH RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
San Pasquale durum wheat	Test fields	Germplasm banks	
White Artichoke of Taranto	Test fields	Germplasm banks	

Manageable valuation path and medium priority	POSITIVE SWOT SCENARIO
	MEDIUM RISK DEGREE

Genetic resource	**In vivo conservation**	**In vitro conservation/ germplasm banks**	**Sustainability _**
But Gentile is real	Collection fields	Meristematic apex cryopreservation	

2.3.4 Proposal of strategic actions

Synthetic judgments regarding the outcome of valorisation, the risk of genetic erosion and sustainability must be related to the territorial reality in which it is intended to valorise the varieties being analyzed in order to propose incisive and effective actions consistent with the needs of the territory. The Mar Piccolo area of Taranto is characterized by agricultural land generally of medium-high extension especially for herbaceous crops (forage, wheat and legumes) and trees (olive trees, vines). Furthermore, the companies benefit from a discreet relationship with the tourist activity of the area and from the proximity to the city center of Taranto and the neighboring municipalities.

From a comparison with agricultural operators regarding the use of forgotten local varieties on the farm, no particular opinions regarding limits and advantages emerge.

For each group of varieties included in the strategic lines, strategic objectives and possible applicable actions are highlighted. The varieties belonging to each group for which the actions can be used are highlighted in brackets.

Group 1: Manageable valorisation path and high priority

The goal for this group of varieties is to leverage the strengths and favorable characteristics to avoid the threat of genetic erosion and accelerate the process of economic exploitation in agriculture, focusing on crops that are more sustainable and profitable to attract new operators and increase the production base.

SHARES

- Incentive for the creation of protection consortia (all varieties).
- Information actions aimed at agricultural operators: conferences, workshops, living labs (all varieties)
- Incentive, in the form of a production premium, for custodian farmers who grow agrobiodiverse varieties (all varieties)
- Contribution to the cost of planting trees (Fico Verdesca, Vite Cigliola , Vite Santa Teresa)
- Information actions and seminars aimed at operators who use the genetic resource
    - agritourism facilities (Fico Verdesca, Cowpea Occhiopinto)
    - restaurateurs (Fico Verdesca, Cowpea Occhiopinto)
    - hotel management schools (Fico Verdesca, Cowpea Occhiopinto)

  - transformers (Bianchetta soft wheat, Verdesca fig, Cigliola vine, Santa Teresa vine)
- Establishment of a farmer's market inside the park (purple bean, green fig)

Group 2. Uncertain valorisation path and high priority
The objective for this group of varieties is to prevent operational difficulties, limiting aspects and external threats from frustrating the producers' efforts to prevent the genetic resource from being dispersed.

SHARES
- Incentive, in the form of a production premium, for custodian farmers who grow agrobiodiverse varieties (all varieties)
- Monitoring actions: scientific studies to verify the valorisation conditions and production consistency (all varieties).
- Information actions aimed at agricultural operators: conferences, workshops, living labs (all varieties)
- Establishment of a farmer's market inside the park (Taranto White Artichoke)

Group 3. Manageable valorisation path and medium priority
The objective for this group of varieties is to enhance the valorisation process in the downstream phase of production, to arouse greater interest in the resource and strengthen its strengths.

SHARES
- Information and promotional actions aimed at citizens, associations, schools, technicians, such as information, social and conventional campaigns, organization of traditional cooking courses (Pero Gentile Reale)
- Establishment of awards and recognitions for park farmers who produce local varieties in a sustainable way (Pero Gentile Reale)
- Establishment of parties, festivals and cultural events linked to local productions (Pero Gentile Reale)
- Establishment of a farmer's market inside the park (Pero Gentile Reale)

3 PRODUCTION REGULATIONS

The specifications were formulated starting from the information gathered within the various activities of the BEST project, taking into account the current indications contained in the documents establishing the "Regional Quality Regime - Quality Products" in accordance with article 16 par. 1 letter b) of Reg. (EU) n. 1305/2013 with which the Region intends to help qualify regional quality agricultural and agri-food productions, allow an expansion of the market outlets of farms in its territory and enhance agricultural and food products with a high controlled quality standard. The production regulations envisage criteria and technical specifications such as to guarantee a quality of the final product that is significantly higher than the current commercial standards and the general ones established by European or national legislation in terms of public health, plant health, environmental protection and specific characteristics of the manufacturing processes. production.

The process of formulating the specifications included an important and essential phase determined by the involvement of local actors. The farmers and technicians involved were offered the characterization sheets of the individual selected varieties and the drafts of the specifications on which they were called to give their contribution in the form of comments, proposed modifications and considerations. These notes, if pertinent and detailed, have been included in the specifications which are proposed below in the integrated form.

3.1 Production Regulations of the "Purple Bean"

Art. 1 – Name and historical notes

Fava Viola, (Leguminous plants, cereals and forage crops: a catalog of Apulian biodiversity , 2018). This broad bean has as its characteristic features large seeds and purple integument with different shades of color. Tender and sweet, it is grown in small family gardens or in intercropping with olive groves and orchards. The use of intact seeds is exclusively for food, while the waste is used in zootechnics. During the monitoring of the regional territory conducted as part of the SaVeGraINPuglia project, the cultivation of this broad bean was found only in small plots in the Itria Valley with the sole exception of a similar sample found in Ceglie Messapica (BR).

The presence of broad bean crops in the Itria valley is reported in writings from the 18th and 19th centuries. However, these sources do not report information on the cultivated types. The farmers interviewed in SaVeGraINPuglia stated that the purple bean is an old variety in the past typical of the area in which the project activities have found its presence. It is currently cultivated on small extensions for exclusive self-consumption by the producers. The seed has been handed down in the company environment by passing from father to son. The Fava Viola is cultivated in small family gardens or in intercropping with olive groves and orchards. The use of intact seeds is exclusively for food, while the waste is used in zootechnics.

Art. 2 - Description and characteristics

Varieties obtained from local populations characterized by the color of the seed coats ranging from beige-green to violet-black.

Plant. Growth determined, height of about 50-70 cm, anthocyanin pigmentation of the stem.
Leaves. Medium dark green colour.
Flowers. On average 2 flowers per plant, wings with patches of black melanin; anthocyanin

banner with spots of melanin, flowering about 138 days after sowing.

Fruits. Pod: semi-erect horizontal habit, average length 11-14 cm, slight or no curvature; 2-3 pods per node;

Seed: elliptical shape, violet colour, presence of black pigmentation of the hilum.

Production characteristics. Low productivity, but appreciated for its organoleptic characteristics. Crop cycle from November to July.

Physical and technological characteristics. Farmers call it more tender and flavorful than the more popular commercial varieties. Some characters related to the quality of the dry grain have been detected.

[Weight of 100 seeds (g) 210 - 250

Tegument (g/100 g) 14.6 - 14.7

Hydration index (% at 24 h) 118 - 121

Swelling index (% at 24 h) 130 - 140

Proteins (g/100 gss) 25.3 - 25.4

Ash (g/100 gss) 5.2

Total polyphenols (mg GAE/ gss) 7.21 - 7.88

Total flavonoids (mg CAE/ gss) 1.6

Condensed tannins (mg CAE/ gss) 0.8)]

Organoleptic characteristics. Intact and homogeneous seeds, of typical size and color of the variety. Good aptitude for cooking, thin skin that adheres well to the pulp, creamy texture and intense flavour.

Beans are composed of 10% water, 24.5% protein, 48% carbohydrates, 14.50% dietary fiber, and the remaining 3% lipids; the minerals present in greater quantities are potassium, magnesium, calcium, phosphorus, etc. Beans contain a good dose of B vitamins, in addition to these we find vitamin E, K, J and vitamin PP.

Art. 3 - Production area

[…]

Art. 4 – Retrieval of semen

National Research Council, Institute of Biosciences and BioResources (CNR-IBBR), Via G. Amendola 165/A, 70126 Bari.

Art. 5 - Production techniques

The method of planting (age, density, method) must allow the achievement of adequate production yields by favoring the improvement of the efficiency of use of water and nutrients, of the competition against weeds and of the ability to defend against adversities .

5.1 tillage and preparation of the seedbed

The preparation of the land for the broad bean consists of deep plowing (30-40 cm) which favors the deepening of the roots and therefore the exploration and exploitation of the deeper water and nutritional resources. It is not necessary to prepare a very refined seedbed considering the size of the seeds.

5.2 Sowing

The optimal sowing period is the second ten days of November. The quantity of seed must be such as to ensure 15-20 plants per m2, the quantity of seed must be calculated on the basis of the average weight of the seeds, generally ranging from 150-200 kg ha-1. Row sowing is generally carried out with universal seed drills in rows 30-70 cm apart, the sowing depth is highly variable and can even go as far as 8-10 cm.

Furthermore, the following obligations of a general nature are identified. Comply with the times, methods and planting densities indicated above. Adopt conservative and low-energy soil management techniques, up to implementing, where possible, no tillage or minimal tillage.

Starting from the second year, cover the inter- rows with grass to preserve or increase the organic substance in the soil, to reduce negative phenomena (compaction, erosion, etc.).

5.3 Fertilization

The supply of fertilizing elements must maintain and improve soil fertility, compensate for crop removal and technically unavoidable losses on the basis of the physiological needs of the crop or according to the indications provided by soil or foliar analyses.

Mineral fertilization is mainly based on the administration of phosphorus. Among the legumes, the fava bean is the one that needs the greatest contributions, in fact, doses between 50-90 kg ha-1 of P2O5 and from 40 to 120 kg ha-1 of K2O are administered based on the endowment of the land. As far as nitrogen is concerned, the broad bean is self-sufficient, thanks to the symbiosis with nitrogen-fixing bacteria, so nitrogenous fertilization is not necessary.

Furthermore, the following obligations of a general nature are identified. Verification of the availability of macroelements and the fertility of the plot concerned for cultivation by means of soil analysis in accredited laboratories every five years.
Definition of a fertilization plan which identifies, by crop or cycle, quantities and timing of distribution, or adoption of the values, referring to individual crops, reported in the Eco-Sustainable Standards for Phytosanitary Defense and Weed control of agricultural crops approved by the Regions .

5.4 Weed control

Weed control must be implemented using minimum doses of products with low impact on humans and the environment, chosen from those with greater efficacy and low persistence and residual nature.

Agronomic and/or biological strategies capable of guaranteeing the lowest environmental impact, within the framework of sustainable agriculture, are to be favoured.

Weed control, in the early stages of the cycle, is essential for the success of the crop through the use of mechanical weeding or chemical interventions according to the provisions of the regional Integrated Production Regulations.

Furthermore, the following obligations of a general nature are identified. Weed control must be carried out compulsorily in accordance with the provisions of the Eco-Sustainable Standards for Phytosanitary Defense and control of weeds of agricultural crops approved by the Regions. The use of a low use of active ingredients of chemical origin with a herbicidal action is allowed only when the adoption of agronomic techniques for weed control does not produce the desired effects

5.5 Phytosanitary defence

The protection of the crop must be implemented using plant protection products in the smallest possible quantity, taking into account the persistence and residual nature of the active ingredients and choosing those with the least impact on the environment and the most effective.
When different techniques or strategies are possible, preference should be given to agronomic and/or biological ones, within the framework of sustainable agriculture.

Among the main adversities of the broad bean are gray mold (*Botrytis fabae*), rust (*Uromyces fabae*) and anthracnose (*Ascochyta fabae*). Among the most fearsome insects we find the black aphid (*Aphis fabae*) and the weevil (*Brucus rufimanus*). Particularly virulent, in highly infested soils, is the action of the orobanche, a parasitic phanerogam, to the point of not recommending the cultivation of broad beans. Their control must include the adoption of preventive measures, such as agronomic means (reduction of fertilization, reduction of

stagnant humidity, adoption of appropriate crop rotations, destruction of diseased crop residues, use of healthy seed).
Specific phytosanitary aids for defense against cryptogams and pests are indicated by the regional Integrated Production Regulations.

Furthermore, the following obligations of a general nature are identified. Compliance with the technical guidelines for crop protection listed in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions is mandatory.
Recourse to a low use of active ingredients of chemical origin with an antiparasitic action is allowed only when the main adversities are controlled through the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of suitable rotations crops, destruction of diseased crop residues, use of less susceptible varieties, etc.) does not produce the desired effects.

5.6 Irrigation

The water needs of the broad bean are satisfied by the rainfall in the autumn and winter months.

If necessary, it is necessary to document the volume of irrigation distributed for the entire crop cycle, providing for the indication of the start and end dates for irrigation.
If specialized business support provided by public administrations is available (e.g. irrigation cards or on-line computer programs), provide for the drafting of an irrigation plan.

5.7 Harvest and post-harvest (packaging and storage)

The methods of collection and delivery to the storage/processing centers must guarantee the maintenance of the best quality and wholesomeness characteristics of the products.

The harvesting of the broad bean as dry grain is carried out when the plant is completely dried and the grain seed has reached humidity values close to those with which it can be stored in the warehouse (10-12%). In general, suitably calibrated wheat combine harvesters are used to avoid loss and damage to the product.

For the industrial product, the harvest takes place when the grains waxy ripe with shelling machines when the optimal tenderness value is reached.

The collection of fresh garden beans is done manually. Dry grain stored in warehouses may be susceptible to attacks by insects whose control must be achieved with prevention techniques or with the use of specific phytosanitary measures indicated by the regional Integrated Production Regulations.

Furthermore, the following obligations of a general nature are identified. Respect of the times of shortage before the collection of the product; execution of post-harvest treatments exclusively with permitted products.

5.8 Marketing and packaging

The dry product must be sorted, cleaned and calibrated before being marketed. They are packed in bags of variable weight. Chromatic variations of the grain represent a peculiarity of productions obtained from local populations.

The fresh garden bean must have tender pods and tender seed (waxy maturation).

Normally a tenderometric degree of 115-125 is required for canned products, 90-105 for frozen products.

3.2 Production regulations for “San Pasquale durum wheat”

Art. 1 – Name and historical notes

San Pasquale durum wheat (Leguminous plants, cereals and forage crops: a catalog of Apulian biodiversity, 2018). San Pasquale durum wheat is also known as "durum San Pasquale" or "San Pasquale". Among the durum wheats whose constitution dates back more than ninety years ago, although initially cultivated over vast territories of southern Italy, and in particular on the Ionian coast, today it is the least widespread as it is cultivated and kept only in public bodies. At the beginning of the 20th century it was said to be cultivated in the hills and mountains with low productivity, although it was appreciated by families for the production of pasta. The plant, with a height between 95 and 110 cm, shows an erect posture unlike other anciently established grains. The spike is whitish in color and fusiform in shape and has a medium density and semi-elongated kernels.

Art. 2 - Description and characteristics

The specification applies to the stages of production, distribution, marketing and sale of products listed below:

- whole wheat flour
- Durum wheat flour
- Re-milled durum wheat semolina

Durum wheat flour: it is the non-granular product obtained from the grinding and consequent sifting of durum wheat grains (Triticum turgidum var. durum);

Durum wheat semolina: it is the sharp-edged granular product obtained from the grinding and consequent sifting of durum wheat grains (Triticum turgidum var. durum);

Re-milled durum wheat semolina: it is the sharp-edged granular product obtained by grinding durum wheat grains (Triticum turgidum var. durum), consequent sifting and subsequent second grinding.

Cereal flours	Maximum humidity (%)	Maximum ash value (% on dry matter)	Minimum value of nitrogenous substances (nitrogen x 5.7, in %)	Minimum value of nitrogenous substances (nitrogen x 5.7, in %) for flour from organic farming	Granulometric value (mesh of 0.187 millimeters of light) maximum (%)
whole wheat flour	14.50	1.70	11.50	10.50	Not expected
Durum wheat flour	14.50	0.86	11.00	10.50	10.00
Re-milled durum wheat semolina	14.50	1.35	11.00	10.50	Not expected

The above flours must possess the specified chemical-physical characteristics. In addition, for all flours, the concentration of deoxynivalenol (DON) must not exceed 200 µg /kg and the addition of organic and inorganic substances of any kind, as well as any treatment with physical or chemical agents, is forbidden.

Plant: upright habit; early emergence of the ear; medium frequency of plants with flag daughter; coleoptile absent or very weak anthocyanin staining; height 95-110 cm, whitish aristas longer than the ear. Culm: pubescence of the upper node absent or very weak; glaucescence of the culm between the flag leaf and the base of the ear absent or very weak;

Flag leaf: glaucescence of sheath and leaflet absent or very weak.

Spike: fusiform shape; no or very weak glaucescence ; absent or very weak anthocyanin pigmentation of anthers; short length; whitish when ripe;

Gluma: lower glume from ovoid to elongated with erect and medium wide shoulder; short straight muron; absence of pubescence of the outer surface;

Seed: semi-elongated with medium length hairs at the tip; no or very slight phenol staining.

PRODUCTION CHARACTERISTICS

- Type of development: alternative
- Earing period (days from 01.04): 12-28
- Ear production: 2.73-3.36 g
- Weight of a thousand seeds: 44-46 g

RESISTANCES

- Cold (0-9 scale): 4-5
- Enticement to harvest (scale 0-9): 3-7
- Snow sickness (0-4 scale): 4

WHOLEMEAL FLOUR TYPES

- Proteins (g/100 gss) 11.6-15.4
- Yellow index (b*) 15.4-16.5
- Brown index (100-L) 14.3-17.4
- Gluten index (%)1 25-30
- Carotenoids (µg /g) 4.5-5.0
- Polyphenols (mg ferulic acid / gss) 1.16

Art. 3 - Production area

[...]

Art. 4 – Retrieval of semen

National Research Council, Institute of Biosciences and BioResources CNR-IBBR, Via Amendola 165/A 70126 Bari; Experimental Educational Center "P. Martucci" of the Department of Soil, Plant and Food Sciences (DiSSPA), Aldo Moro University of Bari, Via Amendola 165/A - 70126 Bari.

Art. 5 - Production techniques

5.1 Choice of land

Wheat cultivation is characterized by good adaptability to different soil conditions. Nonetheless, it is to be assumed that basically clayey soils, well structured and endowed with organic matter, represent the most favorable conditions. Situations that favor water stagnation should be avoided; as regards the pH, soils tending towards neutrality with values between 6.5 and 7.8 are to be preferred; discrete is the tolerance to salinity. The thermal requirements are increasing as the phenological phases evolve: 2-3 °C are sufficient for germination and tillering, 10 °C for doffing, 15 °C for flowering and 20 °C for ripening. During tillering, durum wheat can also withstand low temperatures (a few degrees below zero) but subsequently, during rising, a few degrees below zero can cause irregular growth. Close to flowering, temperatures below 0 °C can cause floral abortion with consequent decline in production potential. The filling phase of the kernels is favored by temperatures around 20-25 °C, excessive temperatures during this phase reduce the accumulation of reserve substances in the kernels and increase the risk of "heat grip" phenomena.

In the case of replanting, the soil must be left to rest for at least three years, during which extensive cultivation or green manure can be practiced. The crop residues must be carefully removed before carrying out new plantings.

5.2 Sowing

The method of planting (age, density, method) must allow the achievement of adequate production yields by favoring the improvement of the efficiency of use of water and nutrients, of the competition against weeds and of the ability to defend against adversities .

5.3 Crop rotation

An agronomically correct crop succession represents a fundamental tool for preserving soil fertility, biodiversity, preventing adversities and safeguarding and improving the quality of productions. In general, autumn-winter cereals take advantage of the rotation with improver or renewal crops. Good crop precessions are represented by grain or forage legumes, as well as renewal crops such as tomato, sugar beet, sunflower, potato rape because they improve the soil thanks to deep tillage and abundant fertilization as well as allowing good weed control . A possible factor to take into consideration is the harvesting period of the renewal crop, in relation to the time available for preparing the land for the sowing of straw cereals. On the other hand, having straw cereals precede a renewal crop offers more chances of being able to perform a good preparation of the soil in consideration of the harvest time (early summer).

5.4 Processing

Soil management and tillage techniques for seedbed preparation must be aimed at maintaining it in good structural condition by preserving the organic matter content and fertility, at the same time improving the efficiency of nutrients, favoring the penetration of water rainwater and irrigation by reducing water losses by leaching, run-off and evaporation, preventing soil erosion.

A widespread practice is to carry out a tillage at about 25-30 cm followed by complementary tillage to reduce the clods. In recent years, the revision of soil tillage techniques has produced a strong reduction in the depth of tillage and an appreciable diffusion of the technique of direct

seeding on the "sodium". In general, the seedbed preparation work must be carried out trying to prevent possible erosion and soil degradation phenomena. For successful no-till sowing, it is important to underline that it must be done a certain amount of time in advance of traditional sowing.

5.5 Sowing

The optimal sowing time, in southern environments, is between the beginning of November and mid-December, anticipating in areas with higher altitudes and in north-facing lands, postponing in lower areas and drier areas. However, it also varies considerably as a function of rainfall and temperature. The age depends on a series of factors and mainly on the variety, soil conditions and above all on the climatic conditions of the cultivation area;

Wheat is sown with row seeders. In the case of sowing on firm ground, specific machines will be used, equipped with disc organs which make a vertical cut in the ground, while the seed is placed through a collector at a depth of 3-5 cm. In the case of minimal tillage, or even reduced tillage, combined seed drills can be used with tools with rotating parts that prepare the seedbed to which normal seed drills equipped with hoppers are connected, or classic mechanical or pneumatic seed drills, the same ones used normally in sowing after deep tillage. Under the most common conditions, the sowing depth of wheat is 3-5 cm deep. The greater depth is advisable in soft and dry soils or in conditions of excessive clods, the lesser one in the opposite operating conditions. The identification of a correct sowing depth, in relation to the environmental conditions in which one operates (characteristics of the soil, humidity, etc. ...) will guarantee a prompt and uniform emergence of the plants. In general, sowing too deep (> 5 cm) reduces the degree of tillering of the crop. In these cases, the final result will be a lower number of secondary tillering culms and a lower production of ears per square metre. The quantity of seed to be used may vary due to the different pedo-climatic conditions of the cultivation area, the fertility of the soil, the sowing period adopted, etc. and an investment of

between 250 and 450 germinable seeds m^2 can be recommended. In particular, the factors that influence the dose of seed to be used are: cultivation area, variety, soil fertility and availability of water resources, seedbed conditions, sowing period. In general, however, both too sparse and too dense sowing should be avoided. In order to allow perfect adhesion of the kernels to the ground, it is advisable to proceed with a rolling job immediately after sowing.

5.6 Fertilization

The supply of fertilizing elements must maintain and improve soil fertility, compensate for crop removal and technically unavoidable losses on the basis of the physiological needs of the crop or according to the indications provided by soil or foliar analyses. A balanced supply of fertilizing elements (nitrogen, phosphorus and potassium) in the quantities and correct in the timing of distribution is necessary to achieve the satisfactory objectives of unit yield and grain quality. Wheat is not very demanding in terms of phosphorus and potassium, in general endowments of 20 ppm of P20s and 100 ppm of K20 suggest that the contribution of these elements is superfluous. The doses of P20 5 to be added annually per hectare are from 0 to 70 kg ha 1 for durum wheat, from 0 to 80 kg ha 1 for soft wheat and from 0 to 90 kg ha 1 for barley, while the doses of K20 vary from 0 to 90 kg ha·1 for durum wheat, from o to 150 kg ha·1 for soft wheat and from 0 to 130 kg ha·1 for barley.

In consideration of their low mobility in the soil, the phospho -potassium fertilization will be carried out at the time of preparing the seedbed or in a localized form at the sowing or, even better, anticipated to the most demanding crops in precession to the cereals (renewals, vegetables, meadows, etc.); technical choice that becomes indispensable if minimum tillage or no-till sowing is envisaged for wheat.

Nitrogen fertilization is a key element in wheat cultivation to increase its productivity. In southern areas characterized by early spring-summer aridity and related risks of heat stress, the overall average dose of nitrogen in the growing season should be around 90-140 kg ha 1 •

This standard dose should be suitably modulated knowing the potential of the specific environments climatic conditions of cultivation and evaluating the seasonal course. Considering the high mobility that N has in the ground, it is necessary to administer the total dose envisaged by dividing it into different times in relation to the needs of the crop, in order to avoid both phenomena of volatilization of the element in ammoniacal form and problems of leaching into the groundwater aquifers. In all cases it is important to consider that the absorption of N becomes very intense starting from the end of the tillering phase, to grow exponentially during the doffing phase. Precisely for this reason it is necessary to ensure the plant the right amount of nitrogen precisely in the phase of "from the ear to 1 cm" which corresponds to the beginning of the rising during which the plant defines the number of seeds per ear.

The choice of the type of fertilizer must be made taking into consideration both the characteristics of the soil (nature of the soil, pH, organic matter and intrinsic fertility of the soil) and the climatic conditions (temperature, rainfall, etc. ...) . Particular attention should be paid to new formulations such as organic -mineral ones and those with slow release nitrogen. In particular situations of plant stress, foliar interventions can be carried out with water-soluble liquid fertilizers.

5.7 Weed control

Weed control must be implemented using minimum doses of products with low impact on humans and the environment, chosen from those with greater efficacy and low persistence and residual nature. Agronomic and/or biological strategies capable of guaranteeing the lowest environmental impact, within the framework of sustainable agriculture, are to be favoured. Weed control, in addition to resorting to the implementation with the application of good agricultural practices, can be carried out with chemical interventions according to the

provisions of the Eco-Sustainable Standards for Phytosanitary Defense and weed control of agricultural crops approved by the Regions.

5.8 Phytosanitary defence

The protection of the crop must be implemented using plant protection products in the smallest possible quantity, taking into account the persistence and residual nature of the active ingredients and choosing those with the least impact on the environment and the most effective. When different techniques or strategies are possible, preference should be given to agronomic and/or biological ones, within the framework of sustainable agriculture. There are numerous pathogenic fungi that can attack the various organs, from the roots to the ear, alone or in association, at different times or simultaneously. There are parasites considered secondary in the past which today, with the intensification of cultivation, are increasing their danger. The most important and common are the following:

- foot ache agents of this phytopathology are fungi of the genus Fusarium (f. nivale, F. culmorum , F. graminearum) which cause browning of the basal part of the culms accompanied by alterations of the roots with consequent early desiccation, reduction in the number of ears and production of shriveled kernels;

- yellow rust (Puccinia glumarum or striiformis) which forms small, rounded, yellow pustules aligned between the veins of the leaves and on the ears; being the least thermophilic, attacks can also occur very early in spring, causing very serious damage in certain years on sensitive varieties;

- black rust (Puccinia graminis tritici variety), is the most thermophilic, it attacks the sheaths and culms of the wheat late, forming elongated, blackish-brown pustules in the very late varieties (while the current early varieties escape it

- brown rust (Puccinia recondita or triticina) which causes yellow-reddish pustules scattered on the two sides of the leaves, has intermediate thermal requirements between the previous ones and causes sporadic but serious attacks;

- powdery mildew or powdery mildew (Erisiphe graminis variety tritici) strikes leaves, stems and ears forming a superficial fluff, first white then greyish, dotted with black dots. This disease develops in particular in very dense and luxuriant crops and in conditions of high relative humidity of the air;

- septoria caused by Septoria tritici and Septoria nodorum . The former develops on wheat leaves during mild winters, causing light brown lozenge-shaped spots that eventually converge until the leaves dry. The second also attacks the nodes of the culm, which become soft, then the ears which become greyish due to the desiccation of the glumes. In the case of contaminated seed, septoria causes rotting of germinating seedlings; to avoid this danger, the tanning of the seeds is needed;

- various caries (Tilletia tritici and Tilletia laevis) are other fungal parasites which transform the grains of wheat into squat, gray-brown ovoid grains, full of a dark powder with an unpleasant smell;

- coal much less dangerous than caries is coal (Usti/ago tritici), which appears when earing. The young ears have no spikelets and are covered with a dark brown powder. The animal parasites that attack the wheat plant usually do not cause widespread damage, and generally do not require special interventions during the vegetation. Stored grain is subject to moth and weevil attacks. The larva of the true moth (Sitotroga cereale/la) penetrates the grain by feeding on its starchy content and can cause considerable damage. On the other hand, the larva of the false moth (Tinea granella) collects several grains with silky threads and feeds on them. When the attack is intense, a felt of connected kernels forms on the surface of the mounds. The

female weevil (Calandra spp.) lays one egg per caryopsis; the larva feeds by gnawing inside the grain.

The control of the main adversities must envisage the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of appropriate crop rotations, destruction of diseased crop residues, use of healthy seeds, use of varieties susceptible, etc ..) Specific phytosanitary aids for defense against cryptogams and phytophages are indicated in the Eco-Sustainable Standards for Phytosanitary Defense and Weed Control of agricultural crops approved by the Regions.

5.9 Irrigation

Wheat and barley are crops typical of dry environments. However, where possible, these species greatly benefit from some irrigation interventions. More precisely, during germination, if the humidity of the soil is not sufficient to allow emergence in a short time, irrigation supplies of the order of 20-25 mm (200-250 m3 ha- 1) are allowed . Subsequently, it could be useful to intervene in correspondence with the barrel and kernel filling phases, with watering volumes such as to bring the soil humidity close to the water capacity of the field.

5.10 Harvest and post-harvest

Harvesting is performed when the grain has reached full maturity and its humidity is less than 13%, which represents the optimal limit for long conservation. Essential to the smooth running of harvesting operations is the perfect set-up of the combine. In fact, the threshing elements, such as the threshing and cleaning apparatus, must have a good adjustment in order to avoid causing damage to the kernels.

5.11 Flour production technology

The cultivation techniques of the cereals from which the grain destined for the production of flour is obtained must comply with the EC regulation n. 1257/1999, and subsequent

amendments. mod. and int., relating to the "GAP (Good Agricultural Practices)". The batches of grain, before processing, must be subjected to pre - cleaning. Before milling, it is possible to mix different batches of grain, in order to obtain flours meeting the characteristics set out in Art. 2 of these Regulations, provided that the correct traceability of the product is guaranteed. The traceability system must make it possible to trace at least the following information: farms supplying the raw materials; cultivated area; production capacity; quantities of product delivered and processed; quantities of product placed on the market under the brand name.

3 .3 Production specification for “Bianchetta soft wheat”

Art. 1 – Name and historical notes

Bianchetta soft wheat, (Leguminous plants, cereals and forage crops: a catalog of Apulian biodiversity, 2018). Bianchetta is undoubtedly the most widespread in Puglia among the local varieties of soft wheat. Its cultivation is widely documented in agronomy texts starting from 1784 (A. Ginori) and in monographs of the 20s, 30s of the last century written by agronomists and technicians of the Experimental Agricultural Stations of the provinces of Bari and Foggia. From what has been reported (De Cillis , 1927) it has been and is often confused with other soft wheat with very similar characteristics, in fact synonyms are French Majorca, Francesella , White Majorca, Carosella. The complexity of the identification of specific characteristics is largely due to the ancient cultivation practice of the "mixture" in which the presence of durum and soft wheat, aristati and mutici, with red and white ears made the work of selecting the " prevailing breed. Very widespread especially since the 1920s in the areas of Foggia, Bari, Taranto, in those close to Basilicata and in Calabria and Molise, often confused with the Carosella because it is similar, its cultivation was well suited in the plains and hills, it happened well with durum wheat and tolerated grains.

Art. 2 - Description and characteristics

The specification applies to the production, distribution, marketing and sale phases of soft wheat flour: the product obtained from the grinding and consequent sifting of the soft wheat grain (Triticum aestivum), freed from foreign substances and impurities;

Cereal flours	Maximum humidity (%)	Maximum ash value (% on dry matter)	Minimum value of nitrogenous substances (nitrogen x 5.7, in %)	Minimum value of nitrogenous substances (nitrogen x 5.7, in %) for flour from organic farming	Granulometric value (mesh of 0.187 millimeters of light) maximum (%)
Soft wheat flour	14.5	1.70	10.5	10.0	Not expected

Soft wheat flours must possess the specified chemical-physical characteristics. In addition, for all flours, the concentration of deoxynivalenol (DON) must not exceed 200 µg /kg and the addition of organic and inorganic substances of any kind, as well as any treatment with physical or chemical agents, is prohibited.

Plant: Semi-erect habit; period of emergence of the ear from medium to late; medium-high frequency of plants with flag leaves; coleoptile absent or very weak anthocyanin staining; height 110-150 cm, whitish aristas longer than the ear, aristas or beards both absent or beards present; very short to short beards.

Culm with pubescence of the upper node absent or very weak; glaucescence of the culm between the flag leaf and the base of the ear from absent or very weak to medium

Leaves: Glaucescence of sheath and leaflet absent or very weak to weak;

Spike: spindle-shaped and with parallel edges; white; absent or very weak to weak glaucescence ; absent or very weak anthocyanin pigmentation of anthers; medium to long length; slightly colored when ripe

Gluma: Lower glume with narrow to medium shoulder width and sloping to slightly sloping shape; short to medium mucron with straight to semi- arched shape ; pubescence of the external surface from absent to little extensive

Seed: white; no or very slight phenol staining

PRODUCTION CHARACTERISTICS:

- Type of development: winter
- Earing period (days from 01.04): 32-46
- Ear production: 1.4-2.2
- Thousand seed weight: 31-57.9 g

RESISTANCES

- Cold (0-9 scale): 4-5
- Enticement to harvest (scale 0-9): 6-7
- Snow sickness (scale from 0-4): 4

WHOLEMEAL FLOUR TYPES

- Proteins (g/100 gss) 13.2-16.3
- Yellow index (b*) 8.8-10.3
- Brown index (100-L) 12-14.4
- Gluten index (%)1 38-48
- Carotenoids (µg /g) 3.3-3.8
- Polyphenols (mg ferulic acid / gss) 1.2

Art. 3 - Production area

[…]

Art. 4 – Retrieval of semen

National Research Council, Institute of Biosciences and BioResources CNR-IBBR - Via Amendola 165/A 70126 Bari; Experimental Company "Manfredini" CREA Research Center for Cereal Growing and Industrial Crops of Foggia Legal Headquarters Via Po, 14 - 00198 Rome (Italy), Operational Headquarters SS 673 km 25+200 - 71122 Foggia

Art. 5 - Production techniques

5.1 Choice of land

Wheat cultivation is characterized by good adaptability to different soil conditions. Nonetheless, it is to be assumed that basically clayey soils, well structured and endowed with organic matter, represent the most favorable conditions. Situations that favor water stagnation should be avoided; as regards the pH, soils tending towards neutrality with values between 6.5 and 7.8 are to be preferred; discrete is the tolerance to salinity. The thermal requirements are increasing as the phenological phases evolve: 2-3 °C are sufficient for germination and tillering, 10 °C for doffing, 15 °C for flowering and 20 °C for ripening. During tillering, durum wheat can also withstand low temperatures (a few degrees below zero) but subsequently, during rising, a few degrees below zero can cause irregular growth. Close to flowering, temperatures below 0 °C can cause floral abortion with consequent decline in production potential. The filling phase of the kernels is favored by temperatures around 20-25 °C, excessive temperatures during this phase reduce the accumulation of reserve substances in the kernels and increase the risk of "heat grip" phenomena.

In the case of replanting, the soil must be left to rest for at least three years, during which extensive cultivation or green manure can be practiced. The crop residues must be carefully removed before carrying out new plantings.

5.2 Sowing

The method of planting (age, density, method) must allow the achievement of adequate production yields by favoring the improvement of the efficiency of use of water and nutrients, of the competition against weeds and of the ability to defend against adversities.

5.3 Crop rotation

An agronomically correct crop succession represents a fundamental tool for preserving soil fertility, biodiversity, preventing adversities and safeguarding and improving the quality of productions. In general, autumn-winter cereals take advantage of the rotation with improver or renewal crops. Good crop precessions are represented by grain or forage legumes, as well as renewal crops such as tomato, sugar beet, sunflower, potato rape because they improve the soil thanks to deep tillage and abundant fertilization as well as allowing good weed control. A possible factor to take into consideration is the harvesting period of the renewal crop, in relation to the time available for preparing the land for the sowing of straw cereals. On the other hand, having straw cereals precede a renewal crop offers more chances of being able to perform a good preparation of the soil in consideration of the harvest time (early summer).

5.4 Processing

Soil management and tillage techniques for seedbed preparation must be aimed at maintaining it in good structural condition by preserving the organic matter content and fertility, at the same time improving the efficiency of nutrients, favoring the penetration of water rainwater and irrigation by reducing water losses by leaching, run-off and evaporation, preventing soil erosion.

A widespread practice is to carry out a tillage at about 25-30 cm followed by complementary tillage to reduce the clods. In recent years, the revision of soil tillage techniques has produced a strong reduction in the depth of tillage and an appreciable diffusion of the technique of direct

seeding on the "sodium". In general, the seedbed preparation work must be carried out trying to prevent possible erosion and soil degradation phenomena. For successful no-till sowing, it is important to underline that it must be done a certain amount of time in advance of traditional sowing.

5.5 Sowing

The optimal sowing time, in southern environments, is between the beginning of November and mid-December, anticipating in areas with higher altitudes and in north-facing lands, postponing in lower areas and drier areas. However, it also varies considerably as a function of rainfall and temperature. The age depends on a series of factors and mainly on the variety, soil conditions and above all on the climatic conditions of the cultivation area;

Wheat is sown with row seeders. In the case of sowing on firm ground, specific machines will be used, equipped with disc organs which make a vertical cut in the ground, while the seed is placed through a collector at a depth of 3-5 cm. In the case of minimal tillage, or even reduced tillage, combined seed drills can be used with tools with rotating parts that prepare the seedbed to which normal seed drills equipped with hoppers are connected, or classic mechanical or pneumatic seed drills, the same ones used normally in sowing after deep tillage. Under the most common conditions, the sowing depth of wheat is 3-5 cm deep. The greater depth is advisable in soft and dry soils or in conditions of excessive clods, the lesser one in the opposite operating conditions. The identification of a correct sowing depth, in relation to the environmental conditions in which one operates (characteristics of the soil, humidity, etc. ...) will guarantee a prompt and uniform emergence of the plants. In general, sowing too deep (> 5 cm) reduces the degree of tillering of the crop. In these cases, the final result will be a lower number of secondary tillering culms and a lower production of ears per square metre. The quantity of seed to be used may vary due to the different pedo-climatic conditions of the cultivation area, the fertility of the soil, the sowing period adopted, etc. and an investment of

between 250 and 450 germinable seeds m^2 can be recommended. In particular, the factors that influence the dose of seed to be used are: cultivation area, variety, soil fertility and availability of water resources, seedbed conditions, sowing period. In general, however, both too sparse and too dense sowing should be avoided. In order to allow perfect adhesion of the kernels to the ground, it is advisable to proceed with a rolling job immediately after sowing.

5.6 Fertilization

The supply of fertilizing elements must maintain and improve soil fertility, compensate for crop removal and technically unavoidable losses on the basis of the physiological needs of the crop or according to the indications provided by soil or foliar analyses. A balanced supply of fertilizing elements (nitrogen, phosphorus and potassium) in the quantities and correct in the timing of distribution is necessary to achieve the satisfactory objectives of unit yield and grain quality. Wheat is not very demanding in terms of phosphorus and potassium, in general endowments of 20 ppm of P20s and 100 ppm of K20 suggest that the contribution of these elements is superfluous. The doses of P20 5 to be added annually per hectare are from 0 to 70 kg ha 1 for durum wheat, from 0 to 80 kg ha 1 for soft wheat and from 0 to 90 kg ha 1 for barley, while the doses of K20 vary from 0 to 90 kg ha·1 for durum wheat, from o to 150 kg ha·1 for soft wheat and from 0 to 130 kg ha·1 for barley.

In consideration of their low mobility in the soil, the phospho -potassium fertilization will be carried out at the time of preparing the seedbed or in a localized form at the sowing or, even better, anticipated to the most demanding crops in precession to the cereals (renewals, vegetables, meadows, etc.); technical choice that becomes indispensable if minimum tillage or no-till sowing is envisaged for wheat.

Nitrogen fertilization is a key element in wheat cultivation to increase its productivity. In southern areas characterized by early spring-summer aridity and relative risks of heat shock, the overall average dose of nitrogen in the growing season should be around 90-140 kg ha·1.

This standard dose should be suitably modulated knowing the potential of the specific soil and climate environments of cultivation and evaluating the seasonal course. Considering the high mobility that N has in the ground, it is necessary to administer the total dose envisaged by dividing it into different times in relation to the needs of the crop, in order to avoid both phenomena of volatilization of the element in ammoniacal form and problems of leaching into the groundwater aquifers. In all cases it is important to consider that the absorption of N becomes very intense starting from the end of the tillering phase, to grow exponentially during the doffing phase. Precisely for this reason it is necessary to ensure the plant the right amount of nitrogen precisely in the phase of "from the ear to 1 cm" which corresponds to the beginning of the rising during which the plant defines the number of seeds per ear.

The choice of the type of fertilizer must be made taking into consideration both the characteristics of the soil (nature of the soil, pH, organic matter and intrinsic fertility of the soil) and the climatic conditions (temperature, rainfall, etc. ...) . Particular attention should be paid to new formulations such as organic -mineral ones and those with slow release nitrogen. In particular situations of plant stress, foliar interventions can be carried out with water-soluble liquid fertilizers.

5.7 Weed control

Weed control must be implemented using minimum doses of products with low impact on humans and the environment, chosen from those with greater efficacy and low persistence and residual nature. Agronomic and/or biological strategies capable of guaranteeing the lowest environmental impact, within the framework of sustainable agriculture, are to be favoured. Weed control, in addition to resorting to implementation with the application of good agricultural practices, can be carried out with chemical interventions according to the provisions of the Eco -Sustainable Standards for Phytosanitary Defense and weed control of agricultural crops approved by the Regions.

5.8 Phytosanitary defence

The protection of the crop must be implemented using plant protection products in the smallest possible quantity, taking into account the persistence and residual nature of the active ingredients and choosing those with the least impact on the environment and the most effective. When different techniques or strategies are possible, preference should be given to agronomic and/or biological ones, within the framework of sustainable agriculture. There are numerous pathogenic fungi that can attack the various organs, from the roots to the ear, alone or in association, at different times or simultaneously. There are parasites considered secondary in the past which today, with the intensification of cultivation, are increasing their danger. The most important and common are the following:

- foot ache agents of this phytopathology are fungi of the genus Fusarium (f. nivale, F. culmorum , F. graminearum) which cause browning of the basal part of the culms accompanied by alterations of the roots with consequent early desiccation, reduction in the number of ears and production of shriveled kernels;

- yellow rust (Puccinia glumarum or striiformis) which forms small, rounded, yellow pustules aligned between the veins of the leaves and on the ears; being the least thermophilic, attacks can also occur very early in spring, causing very serious damage in certain years on sensitive varieties;

- black rust (Puccinia graminis tritici variety), is the most thermophilic, it attacks the sheaths and culms of the wheat late, forming elongated, blackish-brown pustules in the very late varieties (while the current early varieties escape it

- brown rust (Puccinia recondita or triticina) which causes yellow-reddish pustules scattered on the two sides of the leaves, has intermediate thermal requirements between the previous ones and causes sporadic but serious attacks;

- powdery mildew or powdery mildew (Erisiphe graminis variety tritici) strikes leaves, stems and ears forming a superficial fluff, first white then greyish, dotted with black dots. This disease develops in particular in very dense and luxuriant crops and in conditions of high relative humidity of the air;

- septoria caused by Septoria tritici and Septoria nodorum . The former develops on wheat leaves during mild winters, causing light brown lozenge-shaped spots that eventually converge until the leaves dry. The second also attacks the nodes of the culm, which become soft, then the ears which become greyish due to the desiccation of the glumes. In the case of contaminated seed, septoria causes rotting of germinating seedlings; to avoid this danger, the tanning of the seeds is needed;

- various caries (Tilletia tritici and Tilletia laevis) are other fungal parasites which transform the grains of wheat into squat, gray-brown ovoid grains, full of a dark powder with an unpleasant smell;

- coal much less dangerous than caries is coal (Usti/ago tritici), which appears when earing. The young ears have no spikelets and are covered with a dark brown powder. The animal parasites that attack the wheat plant usually do not cause widespread damage, and generally do not require special interventions during the vegetation. Stored grain is subject to moth and weevil attacks. The larva of the true moth (Sitotroga cereale/la) penetrates the grain by feeding on its starchy content and can cause considerable damage. On the other hand, the larva of the false moth (Tinea granella) collects several grains with silky threads and feeds on them. When the attack is intense, a felt of connected kernels forms on the surface of the mounds. The female weevil (Calandra spp.) lays one egg per caryopsis; the larva feeds by gnawing inside the grain.

The control of the main adversities must envisage the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of

appropriate crop rotations, destruction of diseased crop residues, use of healthy seeds, use of varieties susceptible, etc ..) Specific phytosanitary aids for defense against cryptogams and phytophages are indicated in the Eco-Sustainable Standards for Phytosanitary Defense and Weed Control of agricultural crops approved by the Regions.

5.9 Irrigation

Wheat and barley are crops typical of dry environments. However, where possible, these species greatly benefit from some irrigation interventions. More precisely, during germination, if the humidity of the soil is not sufficient to allow emergence in a short time, irrigation supplies of the order of 20-25 mm (200-250 m3 ha- 1) are allowed . Subsequently, it could be useful to intervene in correspondence with the barrel and kernel filling phases, with watering volumes such as to bring the soil humidity close to the water capacity of the field.

5.10 Harvest and post-harvest

Harvesting is performed when the grain has reached full maturity and its humidity is less than 13%, which represents the optimal limit for long conservation. Essential to the smooth running of harvesting operations is the perfect set-up of the combine. In fact, the threshing elements, such as the threshing and cleaning apparatus, must have a good adjustment in order to avoid causing damage to the kernels.

5.11 Flour production technology

The cultivation techniques of the cereals from which the grain destined for the production of flour is obtained must comply with the EC regulation n. 1257/1999, and subsequent amendments . mod. and int ., relating to the "GAP (Good Agricultural Practices)". The batches of grain, before processing, must be subjected to pre - cleaning. Before milling, it is possible to mix different batches of grain, in order to obtain flours meeting the characteristics set out in

Art. 2 of these Regulations, provided that the correct traceability of the product is guaranteed. The traceability system must make it possible to trace at least the following information: farms supplying the raw materials; cultivated area; production capacity; quantities of product delivered and processed; quantities of product placed on the market under the brand name.

3 .4 Production regulations of the “Fico Petrelli”

Art. 1 – Name and historical notes

Fico Petrelli: Particularly widespread in Puglia with greater concentration in the areas of Bari and Brindisi where it is present in more specialized crops, such as in the hamlet of Torre Canne di Fasano where it represents a cultivation specialty (the characteristic envelopes are placed around the apex of the branch to anticipate the maturation). In fact, it is also known by the name of Culumbro fasanese , Fiorone di Torre Canne, Culumbr '. In the Brindisi area it is known as Petrale , in Salento as San Giovanni, San Pietro, Fiorone Mele or Fiorone di San Basilio in Otranto. Ferrara E. and Vendola D., 1987; Ferrara E. et al., 1991; Ferrara G. et al., 2016; Ferrara G. et al., 2017; Minonne F., 2017.

Art. 2 - Description and characteristics

There is a high intra- varietal variability within this cultivar, being a very ancient variety and strongly present in the regional territory. In fact, it is particularly widespread in Puglia with greater concentration in the areas of Bari and Brindisi where it is present in more specialized crops, such as in the hamlet of Torre Canne di Fasano where it represents a cultivation specialty (the characteristic envelopes are placed around the apex of the branch for anticipate maturation). It is in fact also known by the name of Culumbro fasanese , Fiorone di Torre Canne, Culumbr '.

In the Brindisi area it is known as Petrale , in Salento as Culummara bianca, San Giovanni, San Pietro, Fiorone Mele or Fiorone di San Basilio in Otranto, Fiorone di Mola or Polignano in the southeast of Bari. It seems that its origin is traced back to Salento as evidenced by the bibliographic citations of Guglielmi, De Rosa and Vallese where this variety is described under the names of Colummara Bianca and San Giovanni. Instead, it seems that the name Petrelli can be traced back to a farmer in the province of Bari who selected a particular earlier clone of these Salento selections, and spread it on the Bari coast as far as Fasano.

The most important production area includes, in the countryside of Fasano, the hamlets of Torre Canne, Savelleri and Pozzo Faceto. Every year in Pezze di Greco di Fasano the fiorone festival is held where the various producers exhibit their fruits. To anticipate the maturation of both the fioroni and the supplied, inoleation was practiced in ancient times which consisted in anointing with a needle with olive oil in the area around the ostiol to promote the production of ethylene inside the fruit and anticipate the maturation. Instead, for the caprification of the supplies, necklaces of capricious fruits were placed on the plants (generally 3 or 4 per plant), or in Fasano vases with ripe fruit inside were placed under each plant to attract pollinating insects (Blastophaga psenes). Plant appreciated above all for its flowers, but also for the supplied ones as they are early. Poor resistance to manipulation.

Plant: high vigour; spreading habit with dense branching; average aptitude for producing suckers.

Leaves: size 28.8cm x 20.1cm; five-lobed shape with crenate margin; dark green color; oboval central lobe; circular ovate lateral lobes; open U- shaped petiole sinus ; long petiole > 80 mm of light green colour;

Fruits: parthenocarpic development; high weight (> 90 g); very large width (> 60 mm); high length (> 75 mm); piriform shape; hemispherical apex; presence of a small neck; easy detachment of the fruit from the peduncle; high leakage of latex from the peduncle; ostiole depressed and semi-open, medium size 1-3 mm; white color of the ostiol; absence of a pink drop at the opening of the ostiole; skin with a green background color; absence of skin blush ; peel thickness 2-3 mm; ease of peeling; transversal cracks in the peel; abundant bloom; averagely present medium-sized lenticels; dark red flesh of medium texture; aromatic taste; average presence and size of achenes; high juiciness and sweetness.

Productive characteristics: harvesting period: first and second ten days of August; of high productivity, medium scale of ripening. It has no particular agronomic needs. Resistant to drought and salty soils.

Technological characteristics: low resistance to manipulation, especially by those supplied. Variety with a sour and aromatic taste, very pleasant. Only suitable for fresh consumption. Enter many traditional recipes. in the Fasano area, the fiorone of this variety is also enjoyed rubbed on hot bread together with walnuts or accompanied by capocollo and almonds.

Art. 3 - Production area

[…]

Art. 4 – Finding of plant material

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Art. 5 - Production techniques

The particular resistance of plants to drought and various pathogens does not impose particular requirements regarding cultivation techniques.

The planting layouts and distances can be variable, it being understood that the planting density cannot exceed 700 plants per hectare. In the new plants, however, the plants must be inserted according to a geometric distribution which provides for the establishment of rows parallel to each other and inter-rows which allow the transit of agricultural machinery.

The forms of cultivation are those with free vase, in traditional use in the area, and those recently proposed by research which recall the bushy vase and the hedge.

The maximum unitary production of fresh figs must not exceed 19 t/ha of specialized cultivation. Without prejudice to this limit, in the case of non-specialised cultivation, the maximum production per hectare of mixed plants must be related to the actual surface covered by the fig trees.

The picking of figs with peel must be done when the figs are overripe, while the figs to be used for drying without peel can be picked when not fully ripe. The technique of puncturing the fruit and inoiling it is permitted, which must be carried out with natural products.

The fruit drying process only concerns whole fruit and must take place with direct exposure to the sun and/or with the application of adjuvant techniques such as the protection of fruit exposed to the sun with plastic tunnels with a minimum height of two meters and/or the wetting of the fruit in an aqueous solution.

3.5 Production regulations of the “Fico Verdesca”

Art. 1 – Name and historical notes

Fico Verdesca, Variety known above all in the areas of Brindisi and Taranto, as reported by Vallese in his work in 1909. The towns where it was most widespread are Martina Franca, Cisternino, Francavilla Fontana, where it was also cultivated for the production of figs dried. It is also called in some areas Verdescone . On the Dauni Mountains, the name Verdesca is known for a completely different variety , with an elongated pear-shaped shape, dark green skin and very large white lenticels, dark red pulp. Gasparini G., 1845; Valais F., 1909; Mazzilli F., 1927; Condition IJ, 1955; Donno G., 1959. Grassi G., 1984; AA.VV., 1999; Minonne et al, 2012; Trotta L. et al., 2013; Minonne F., 2017.

Art. 2 - Description and characteristics

Variety known above all in the areas of Brindisino and Tarantino, as reported by Vallese in his work in 1909. The countries where it was most widespread are Martina Franca, Cisternino, Francavilla Fontana, where it was also cultivated for the production of dried figs. It is also called Verdescone in some areas . In the Monti Dauni, a completely different variety is known under the name Verdesca, with an elongated pear-shaped shape, dark green skin and very large white lenticels, dark red pulp. Medium-high resistance to manipulation and splitting of the ostiol.

Plant: high vigour; spreading habit with dense branching; average aptitude for producing suckers.

Leaf: size 21cm x 19cm; five-lobed shape with crenate margin; dark green color; oboval central lobe; circular ovate lateral lobes; open U- shaped petiole sinus ; medium length 50-80 mm light green petiole; late leaf fall.

Fruit: parthenocarpic development; average weight (50-90 g); average width 39-49 mm); medium length (47-54 mm); globular shape; flat apex; absence of the neck; easy detachment

of the fruit from the peduncle; high leakage of latex from the peduncle; ostiole depressed and semi-open, medium size 1-3 mm; pink color of the ostiol; presence of pink drop at the opening of the ostiole; skin with a green background color; absence of skin blush ; average skin thickness 2-3 mm; ease of peeling; transversal cracks in the peel; abundant presence of bloom; averagely present and large white lenticels; dark red flesh of fine texture; intense flavor and high juiciness and sweetness; high presence of medium-sized achenes;

Productive characteristics: harvesting period first ten days of September. Of high productivity, medium scale of ripening. It has no particular agronomic needs.

Technological characteristics: high resistance to manipulation. Variety with a sour and aromatic taste, very pleasant.

Art. 3 - Production area

[…]

Art. 4 – Finding of plant material

Research, Experimentation and Training Center in Agriculture Basile Caramia, Via Cisternino, 281 - 70010 Locorotondo (BA); Foundation for the management of the University Botanical Garden University of Lecce - 73100 Lecce, Località Masseria S. Angelo

Art. 5 - Production techniques

The particular resistance of plants to drought and various pathogens does not impose particular requirements regarding cultivation techniques.

The planting layouts and distances can be variable, it being understood that the planting density cannot exceed 700 plants per hectare. In the new plants, however, the plants must be inserted according to a geometric distribution which provides for the establishment of rows parallel to each other and inter-rows which allow the transit of agricultural machinery.

The forms of cultivation are those with free vase, in traditional use in the area, and those recently proposed by research which recall the bushy vase and the hedge.

The maximum unitary production of fresh figs must not exceed 19 t/ha of specialized cultivation. Without prejudice to this limit, in the case of non-specialised cultivation, the maximum production per hectare of mixed plants must be related to the actual surface covered by the fig trees.

The picking of figs with peel must be done when the figs are overripe, while the figs to be used for drying without peel can be picked when not fully ripe. The technique of puncturing the fruit and inoiling it is permitted, which must be carried out with natural products.

The fruit drying process only concerns whole fruit and must take place with direct exposure to the sun and/or with the application of adjuvant techniques such as the protection of fruit exposed to the sun with plastic tunnels with a minimum height of two meters and/or the wetting of the fruit in an aqueous solution.

3.6 Production regulations of the “Pero Gentile Reale”

Art. 1 – Name and historical notes

Pero Gentile real, very ancient, is present in almost the whole region, especially in the Bari and Taranto areas, but also in the Gargano. It was one of the varieties suitable for export. Briganti G., 1910. Stella N., 1932; Donno G., 1959. Brazanti E., Sansavini S., 1964; Maldarelli D., 1969; Ferrara E., 1970; Reina A., 1974; Biscotti N., Biondi E., 2008; Biscotti N. et al., 2010.

Art. 2 - Description and characteristics

It is a very ancient variety, present in almost the entire Region, especially in the Berese and Tarantino areas, but also in the Dauno Sub-Apennines and on the Gargano. The name seems to lead back to its noble origins, perhaps brought to Puglia by the Angevins. Gaetano Briganti, Director of the Agricultural Department for the province of Bari, mentions it in 1910, in the publication "For the increase of fruit growing in the province of Bari". It is mentioned in: "Principal among the best fruit for export", as varieties exported for the Austrian market, but whose cultivation should not be extended, to the advantage of the Gentile and Ambrosini cultivars.In the magazine "La propaganda Agricola", in the 1932 issue, in the article "For a greater diffusion of good varieties of pears in the province of Bari" by Nicola Stella is described as a "variety with very sweet fruit, but which is consumed only on the internal markets because it is not very resistant to travel, good for jams. It ripens between mid-July and early August". Scaramuzzi also mentions it in the "Main varieties of peraglie cultivated in the Gargano" of 1949 and Branzanti and Sansavini in 1964, who also mention it in Campania, in particular in the province of Avellino. Prof. Donno talks about it as one of the best varieties present in Puglia in his essay on the pear varieties present in Salento.Ferrara describes it among the varieties present in the province of Bari and defines it as a good table pear.It is also only mentioned by Reina in his publication "Very early and early pear cultivars in the province of Taranto", among

the best varieties spread in the Region. Maldarelli in his "Anthology of Giovinazzo", reports the dialectal name. Plant of high productivity, good resistance to manipulation.

Plant: medium vigour; spreading habit with medium branching; upright-flat branches; fructification mainly on lamburde;

Leaves: downwards from the shoot; medium size (30-40 cm2); elliptical shape; acute base and acute apex; long apex; margin crenate; superficial incisions on the margin of the leaf blade; upper page dark green; absence of pubescence on the underside; medium length of petiole; short distance of stipules from base of petiole;

Flowers: medium size of flower buds; petals separate from each other; medium size of the petals with a rounded shape; stigma located inferior to the stamens

Fruits: short turbinated shape; Bruno; asymmetrical; maximum diameter towards the glass; small size (110-150 g); concave sides; shallow stalk cavity (<0.20); narrow peduncle cavity; sepals disjointed; calyx cavity absent; smooth, unfurrowed, green-yellow skin; low extent of pink-red blush ; little presence/absence of rust at the peduncle attachment; no rust on top and bottom; medium length and thickness of the peduncle; medium thick skin; whitish pulp, medium texture, firm consistency; medium juiciness and high oxidation; intermediate flavor and medium acidity; small seeds (6-7 mm), oval and light brown;

Productive characteristics: harvesting period third ten days of June – first ten days of July. Of high productivity. It adapts to all regional pedoclimatic environments, rustic variety, moderately resistant to scab.

Technological characteristics: good size, but poor resistance to handling. Very good flavour, sweet, with a slightly acidic aftertaste. Suitable for fresh consumption, but also for transformation into juice, puree, jam, etc.

Art. 3 - Production area

[…]

Art. 4 – Finding of plant material

Research, Experimentation and Training Center in Agriculture Basile Caramia, Via Cisternino, 281 - 70010 Locorotondo (BA)

Art. 5 - Production techniques

The choice of land must be made in relation to the cultivation environment, therefore, before planting it is necessary to have information on the soil characteristics of the area involved in the orchard, in order to check whether they meet the needs of the crop. With regard to the characteristics of the soils, it is advisable to verify compliance with the needs of the crops, even if conditions of good fertility and structure of the soil represent the minimum requirements for a successful planting.

Propagation and planting. The method of planting (processing, period, density, methods) must allow the achievement of adequate production yields favoring the improvement of the efficiency of use of water and nutrients, of the competition against weeds and of the defense capacity from adversity.

The choice of the rootstock must be made very carefully for the success of the plant. Fundamental aspects to keep in mind are the adaptability to the climatic conditions of the area, sensitivity to parasites, fruit ripening period and commercial validity. Reduced vigor rootstocks are preferable, as they allow easier and more economic management of cultivation operations and induce an early entry into production, suitable for the variety chosen, for the type of soil and as well as resistant to the main parasitic adversities. The pear tree is normally grafted onto

the frank and the quince to a limited extent. The grafted pear stomata are planted 3.5-4 m between the rows and 2-3 on the row in relation to the rootstock, the vegetative vigor and the training system. In the spindle system the distance is 4 meters and 1.8-2 between the plants. The planting operations, the subsequent cultivation treatments, the training and training pruning are identical to those of the apple tree.

Production pruning. The pear produces on lamburde, one-year-old branches and brindilli, the young plants also produce on mixed branches. Pruning is differentiated according to cultivar. In general, it is necessary to thin out the one-year-old branches and only trim the extensions of the branches; tie rods or chains are made by firmly joining the branches of one branch and the other. The fruit-bearing productions are also thinned out and renewed, eliminating them in part, leaving only the most suitable number; for example, with removals from 20% to 50%. With pruning the parasitic parts are eliminated and the skeleton of the tree is preserved over time. In the pear tree, green pruning is also necessary.

Cultural care: For weeds: Weeds exert their maximum water competitiveness in the spring-summer period, a period in which their control must be absolutely practiced. Weed control involves agronomic management on the inter -rows and chemical weeding on the row, with the use of total action molecules. Alternatively, the technique of grassing in the inter -row and weeding on the row is used.

The pear tree, like the apple tree, is affected by numerous diseases caused by microorganisms of various kinds, the damage can be caused by fungi, bacteria, viruses and phytoplasmas , animal parasites.

Among the main fungal diseases of the apple tree we have scab, powdery mildew, cankers from nectaria ; less frequent instead are the rottenness of the collar, the alternariosis , the

bacterial tumor, the bacterial fire blight. The defense is mainly based on sulfur and copper based products.

Among the viruses and phytoplasmas we find the latent virosis (pitting of the trunk, chlorotic leaf spot, groove of the trunk), the mosaic, the ulcerative russeting, the stellar split, the green hump, the rusty warty of apples, the crateriform hollow of apples , scopazzi, which occur on the fruit; other anomalies of the woody organs are caused by plastomania and rubber sickness. The means of control are of a preventive type, using certified virus-free or virus-controlled plants. Among the phytophagous we mention lepidoptera, such as carpocapsa, red and yellow rodilegno, aphids (grey, woolly, green), while among others there are mites, such as eriophide , red spider mite and the San Josè cochineal. The control of the main adversities must provide for the adoption of preventive measures, such as agronomic means, use of certified virus-free propagation material, virus-tolerant or resistant varieties, fight against vectors.

Fertilizers: a specialized pear orchard removes on average 120 units of N, 50 of P20s and 80 d1 K2O for which it is considered appropriate to return about 150 units of nitrogen 0-90 of P20 5 and 80-120 of K2O, to also compensate for losses of elements of fertility in the soil.

Irrigation: the beneficial effects of irrigation are evident on pear cultivation , especially if it is implemented in loose and shallow soils, starting from the fruit enlargement phase (veraison).

Collection and production. The harvest takes place when most of the fruits have reached commercial maturity which is determined with theoretical and practical indices such as for the apple tree, paying particular attention to the lots that are destined for cold storage. It is important that the fruits are harvested with the stalk and not damaged. The average production varies from 40-50 kg for a palm tree which corresponds to 300-350 q/ha of commercial product. The rules for cold storage are similar to those of the apple tree. Soil management, in the first years of crop establishment, requires minimum tillage for the

mechanical control of weeds, the burial of fertilizers and the reduction of water losses through evaporation. Specialized plants can take advantage of the adoption of non-working techniques of the land and natural grassing between the rows or by resorting to the sowing of mixtures with a prevalence of graminaceous plants that have limited irrigation needs, modest development of the aerial part, scarce needs in nutritional elements.

3.7 Production regulations of the “Pero Recchia Falsa”

Art. 1 – Name and historical notes

Pero Recchia falsi, widespread in many areas of Bari and Brindisi, but also in Taranto and Lecce. The reports collected belong to the territories of Locorotondo, Conversano and Polignano a Mare. Being a very ancient pear tree, many cases of synonymy have developed. Pantanelli 1936 talks about it. Scaramuzzi 1949, Lococciolo 1964., Martellotta., 1964., Branzanti Sansavini 1964 Reina 1974 Minnone 2017.

Art. 2 - Description and characteristics

Very ancient variety, widely spread throughout Puglia. However, there are several cases of synonymy. Being a very ancient variety and widespread throughout the region, there is a high intra-varietal variability . Pantanelli in "The fruit growing in the land of Bari" of 1936 on page. 77 mentions it among the best summer pears in the Region, important because they ripen in a period in which there are no foreign varieties on the market. Scaramuzzi also mentions it in the "Main pear varieties cultivated in the Gargano" of 1949 and Branzanti and Sansavini in 1964. It is also described by Reina in the "Early and precocious pear cultivars in the province of Taranto", both as False ear and as Vetriolo pear , from which the obvious synonymy can be deduced. It is described as an excellent table variety. Highly productive, medium-low resistance to handling.

Plant: medium vigour; spreading habit with medium branching; upright-flat branches; fructification mainly on lamburde;

Leaves: flat compared to the shoot; medium size (30-40 cm2); obovate shape; obtuse base and acute apex; long apex; margin crenate; superficial incisions on the margin of the leaf blade; upper page dark green; absence of pubescence on the underside; long petiole; short distance of stipules from base of petiole;

Flowers: medium size of flower buds; petals separate from each other; medium size of the petals with an elongated elliptical shape ; stigma located inferior to the stamens;

Fruits: short turbinated shape; green-brown; slightly asymmetrical; maximum diameter towards the glass; small size (110-150 g); concave sides; shallow stalk cavity (<0.20); narrow peduncle cavity; sepals crossed; calyx cavity absent; smooth, unfurrowed, green-yellow skin; no or very limited overcolour ; extensive presence of rust at the peduncle attachment; medium presence of rust on the upper and lower part; medium length and thickness of the peduncle; thin skin; whitish pulp, coarse texture, medium consistency; dry and high oxidation; intermediate flavor and low acidity; seeds small (6-7 mm), oval and light brown.

Productive characteristics: harvest period third ten days of July – first ten days of August. Of high productivity. It adapts to all regional pedoclimatic environments, rustic variety, moderately resistant to scab.

Technological features: medium resistance to manipulation. Very good flavour, sweet, with a slightly acidic aftertaste. Suitable for fresh consumption, but also for transformation into juice, puree, jam, etc. having a fairly high sugar content, so it requires very little added sugar.

Art. 3 - Production area

[…]

Art. 4 – Finding of plant material

Research, Experimentation and Training Center in Agriculture Basile Caramia, Via Cisternino, 281 - 70010 Locorotondo (BA); Foundation for the management of the University Botanical Garden University of Lecce - 73100 Lecce, Località Masseria S. Angelo

Art. 5 - Production techniques

The choice of land must be made in relation to the cultivation environment, therefore, before planting it is necessary to have information on the soil characteristics of the area involved in the orchard, in order to check whether they meet the needs of the crop. With regard to the characteristics of the soils, it is advisable to verify compliance with the needs of the crops, even if conditions of good fertility and structure of the soil represent the minimum requirements for a successful planting.

Propagation and planting. The method of planting (processing, period, density, methods) must allow the achievement of adequate production yields favoring the improvement of the efficiency of use of water and nutrients, of the competition against weeds and of the defense capacity from adversity.

The choice of the rootstock must be made very carefully for the success of the plant. Fundamental aspects to keep in mind are the adaptability to the climatic conditions of the area, sensitivity to parasites, fruit ripening period and commercial validity. Reduced vigor rootstocks are preferable, as they allow easier and more economic management of cultivation operations and induce an early entry into production, suitable for the variety chosen, for the type of soil and as well as resistant to the main parasitic adversities. The pear tree is normally grafted onto the frank and the quince to a limited extent. The grafted pear stomata are planted 3.5-4 m between the rows and 2-3 on the row in relation to the rootstock, the vegetative vigor and the training system. In the spindle system the distance is 4 meters and 1.8-2 between the plants. The planting operations, the subsequent cultivation treatments, the training and training pruning are identical to those of the apple tree.

Production pruning. The pear produces on lamburde, one-year-old branches and brindilli, the young plants also produce on mixed branches. Pruning is differentiated according to cultivar. In general, it is necessary to thin out the one-year-old branches and only trim the extensions of the branches; tie rods or chains are made by firmly joining the branches of one branch and

the other. The fruit-bearing productions are also thinned out and renewed, eliminating them in part, leaving only the most suitable number; for example, with removals from 20% to 50%. With pruning the parasitic parts are eliminated and the skeleton of the tree is preserved over time. In the pear tree, green pruning is also necessary.

Cultural care: For weeds: Weeds exert their maximum water competitiveness in the spring-summer period, a period in which their control must be absolutely practiced. Weed control involves agronomic management on the inter -rows and chemical weeding on the row, with the use of total action molecules. Alternatively, the technique of grassing in the inter -row and weeding on the row is used.

The pear tree, like the apple tree, is affected by numerous diseases caused by microorganisms of various kinds, the damage can be caused by fungi, bacteria, viruses and phytoplasmas , animal parasites.

Among the main fungal diseases of the apple tree we have scab, powdery mildew, cankers from nectaria ; less frequent instead are the rottenness of the collar, the alternariosis , the bacterial tumor, the bacterial fire blight. The defense is mainly based on sulfur and copper based products.

Among the viruses and phytoplasmas we find the latent virosis (pitting of the trunk, chlorotic leaf spot, groove of the trunk), the mosaic, the ulcerative russeting, the stellar split, the green hump, the rusty warty of apples, the crateriform hollow of apples , scopazzi, which occur on the fruits; other anomalies of the woody organs are caused by plastomania and rubber sickness. The means of control are of a preventive type, using certified virus-free or virus-controlled plants.

Among the phytophagous we mention lepidoptera, such as carpocapsa, red and yellow rodilegno, aphids (grey, woolly, green), while among others there are mites, such as eriophide

, red spider mite and the San Josè cochineal. The control of the main adversities must provide for the adoption of preventive measures, such as agronomic means, use of certified virus-free propagation material, virus-tolerant or resistant varieties, fight against vectors.

Fertilizers: a specialized pear orchard removes on average 120 units of N, 50 of P20s and 80 d1 K2O for which it is considered appropriate to return about 150 units of nitrogen 0-90 of P20 5 and 80-120 of K2O, to also compensate for losses of elements of fertility in the soil.

Irrigation: the beneficial effects of irrigation are evident on pear cultivation , especially if it is implemented in loose and shallow soils, starting from the fruit enlargement phase (veraison).

Collection and production. The harvest takes place when most of the fruits have reached commercial maturity which is determined with theoretical and practical indices such as for the apple tree, paying particular attention to the lots that are destined for cold storage. It is important that the fruits are harvested with the stalk and not damaged. The average production varies from 40-50 kg for a palm tree which corresponds to 300-350 q/ha of commercial product. The rules for cold storage are similar to those of the apple tree.

Soil management, in the first years of crop establishment, requires minimum tillage for the mechanical control of weeds, the burial of fertilizers and the reduction of water losses through evaporation. Specialized plants can take advantage of the adoption of non-working techniques of the land and natural grassing between the rows or by resorting to the sowing of mixtures with a prevalence of graminaceous plants that have limited irrigation needs, modest development of the aerial part, scarce needs in nutritional elements.

3.8 Production regulations of the " Sant Anna Ovale plum tree"

Art. 1 – Name and historical notes

Plum S. Anna Oval. Unknown but very ancient, found in the countryside of Ostuni (Br), called with this name due to the ripening period which takes place at the end of July. With a characteristic shape, it has a pointed fruit apex. Suma F. and Venerito P., 2008.

Art. 2 - Description and characteristics

Unknown but very ancient origin, found in the countryside of Ceglie Messapica (Br), called with this name due to the ripening period which takes place at the end of July. From the characteristic shape, in fact it has a neck towards the peduncle, it seems to be the Susina Basaricatta or Collotorto described in the Pomona di Gallesio. Highly productive plant, medium ripening scale and medium resistance to handling. (Suma F. Venerito P. 2008).

Plant with upright branches and darts;

Small leaves; length 60mm; width 32mm; obovate shape; obtuse apex and acute base; medium pubescence of the lower page; tight margin; upper page dark green; light green underside; medium length of leaf stalk; absence of leaf glands .

Flowers: small corolla; sepals ovate; elliptical and elongated petals in contact with each other; absence of pubescence of the ovary

Fruits: medium size; average weight 80 g; length 70mm; width 41mm; thickness 35mm; elliptical shape; rounded apex; stalk cavity shallow and not very wide; very evident light colored suture line; medium detachment of the peduncle from the fruit; peduncle apex after dry detachment; golden yellow epicarp; absence of overcolour ; thin skin; high number of lenticels on the skin; medium-sized lenticels; medium firm pulp ; aromatic taste; semi- adherent stone to the pulp; average amount of juice produced; colorless juice; medium-high acidity.

Productive characteristics: Harvesting period at the end of July. Of high productivity, medium scale of ripening. It has no particular agronomic needs.

Technological features: medium resistance to manipulation. Variety with a sour and aromatic taste, very pleasant.

Art. 3 - Production area

[…]

Art. 4 – Finding of plant material

Research, Experimentation and Training Center in Agriculture Basile Caramia, Via Cisternino, 281 - 70010 Locorotondo (BA)

Art. 5 - Production techniques

Plum trees are sensitive to spring frosts as they flower early and are not very suitable for calcareous soils. European plum trees are more resistant to cold and more adaptable to fresh and deep soils.

Planting layouts and training methods

Vase, medium height cultivation, was the most used form of cultivation with distances varying from 5x 5 to 6x6 m in relation to the vigor of the rootstock and the variety.

Palmetta: with regular or irregular branches, it is a form of cultivation suitable for plum trees; facilitates pruning and harvesting operations; lately the anticipated palmette is preferred. Suitable planting patterns vary from 4x4 to 5x5

Belgian hedge: involves the upsilon training of plants with spacing of 2-3 m on the row so that the branches of neighboring plants can cross. The distance between rows is kept at 4 m.

The plum tree is easily multiplied by seed to obtain free rootstocks or new cultivars. The multiplication by herbaceous or woody cuttings and the offshoot for subjects to be grafted as a dormant bud or in a triangle are also widely used. Recently also by meristem.

Rootstocks: Mirabolano, San giuliano, Bromton , Pesco.

Ordinary production pruning is modest in European plum trees, as they mainly produce on bunches in May and require less vegetative renewal.

For this reason, caesarean interventions are limited and tend to favor the vegetative habitus of the individual cultivars and specific grafting combinations. Topping and Eldging mechanical pruning also gave good results in palmette training systems . The pruning of Sino-Japanese plums that produce on mixed branches and bunches in May is much more vigorous, in order to ensure good production and adequate renewal of the foliage.

Soil tillage in the plum grove is carried out in all areas where the modest availability of water makes it advisable to avoid any form of grassing which could compete with the main crop. In the more humid northern regions, total grassing of the soil or only of the rows prevails.

Fertilization. Fundamental plant fertilization is recommended in industrial plum groves . Ordinary production fertilization involves the autumn distribution of 100 units of P2O5 and, if necessary, 100 units of K2O, while nitrogenous fertilization takes place in spring, distributing in relation to soil fertility from 60 to 100 units of N.

Irrigation: The maintenance of adequate water availability in the soil during the entire growing season is essential for the plum tree, therefore irrigation is very useful in Puglia. We proceed if possible with the drip irrigation system.

Harvesting: done manually with ladders, with productions of 20-30 kg/hour.

3.9 Production specification of the “White Artichoke of Taranto”

Art. 1 – Name and historical notes

Ancient variety of artichoke grown sporadically, even in the past, in the gardens of the province of Taranto. Mentioned in the 1976 Atlas of artichoke varieties, the variety is described for its historical and productive characteristics with brief observations and two photos (pages 76 and 77).

Previously, Felice D'Introno (1967) indicated it among the Apulian varieties in the book "Le composite superlative", a book dedicated to the production of artichoke, cardoon and salad. In particular, it refers to artichoke cultivation data in the decade 1955-1966. The text reports studies on the vegetable conducted by the University of Sassari and the University of Bari under the patronage of the National Research Council, on techniques and methods of cultivation, planting and multiplication of the artichoke field, fertilization and genetic improvement.

To attract our attention is a section dedicated to the production of artichoke in Puglia. The cultivation of the artichoke in Puglia in that period had an unexpected result, thanks to the ease of placing the product on the markets of northern Italy at profitable prices. The text reports that the crop was first introduced in the dry lands in the countryside of Bisceglie and that it subsequently spread to the countryside of Mola di Bari, Mesagne, Brindisi and Gallipoli. Since 1950 the artichoke has made its triumphal entry into the Capitanata (San Ferdinando di Puglia, Trinitapoli, Margherita di Savoia, Cerignola and Manfredonia), revolutionizing the old system of extensive cereal farming. The most widespread variety was of the “Catanese” (Niscemese) type, although it had undergone morphological variations.

The production of artichoke in Bari and in part also in Brindisi and Taranto increased considerably in 1950, above all with the arrival of irrigation water, essential for forced cultivation of the vegetable. The Apulian varieties mentioned are: Artichoke of Taranto or Bianco Tarantino, Locale di Mola, Locale di Ostuni, Centofoglie, Early Violet.

White Artichoke of Taranto, Source BiodiverSO Almanac (2018). This variety is by now not very present in the Taranto area. A high morphological similarity was found with the Bianco di Ostuni and the Verde di Putignano. With the BiodiverSO project , thanks to the contribution of prof. Donato Gallitelli, this variety has been cured of fungi and viruses by micropropagation and thermotherapy. The DISAAT, starting from the vegetative tips of young growing carducci , taken from the specially identified mother plants, is conserving the minimum growth for the in vitro maintenance of this genetic resource, which has also been characterized after micropropagation . This local variety , conserved ex situ in the catalog field of the IBBR of the CNR of Bari, has been characterized from an agronomic, morphological and molecular point of view using SNP markers (variation of single nuclei - otides of DNA) by the IBBR-CNR

Art. 2 - Description and characteristics

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Small main stem with two lateral flower heads; height with main flower head of 95 cm; diameter of 120cm; medium pollen -bearing aptitude .

Leaves: semi-erect attitude; length of 75cm; grayish green color; faint reddish coloration at the base of the midrib.

Main flower head: height of 11 cm; diameter of 7cm; weight 120-190g; oval longitudinal section; flat apex; average density of internal bracts.

External bracts: green color of the external side; acute apex; spine absent or very short; shape longer than wide.

Productive characteristics: harvest period March-May. The plant produces 5-6 flower heads and can be productive for more than three years. medium pollen-bearing aptitude ;

chlorogenic acid and cynarin are the most present antioxidants, although in smaller quantities than in other Apulian local varieties analysed.

Art. 3 - Production area

[…]

Art. 4 – Retrieval of semen

Experimental Educational Center "P. Martucci" of the Department of Soil, Plant and Food Sciences (DiSSPA), Aldo Moro University of Bari, Via Amendola 165/A - 70126 Bari; National Research Council, Institute of Biosciences and BioResources (CNR-IBBR), Via G. Amendola 165/A, 70126 Bari

Art. 5 - Production techniques

5.1 Choice of land

The cultivation of leafy or stem vegetables should preferentially be carried out in environments with a Mediterranean climate on deep, well-drained medium-textured soils. In the case of multi-year cycle crops, such as artichoke and asparagus, permanence on the same plot of land for several years does not allow them to be included in a normal agricultural rotation, even if they are to be considered improvement crops. It is best not to let the crops follow themselves as well as the potato, carrot and sugar beet. The economic duration of the crop cycle depends

on the phytosanitary state of the crop as well as on the consolidated practices in the various regional cultivation areas. Cauliflower, broccoli and turnip greens are generally considered catch crops following cereals, legumes and forage crops. Successions with the same species or others belonging to the same botanical family are to be avoided, as are rotations with Solanaceae, Umbelliferae and Cucurbitaceae due to phytopathological problems. Although fennel and celery alternate with different horticultural crops, it is preferable that they return to the same plot, after a period of 2 years, in succession to a crop that does not belong to the same botanical family. A good practice is to predict the return of lettuce to the same plot of land after 2-3 years. Among the most widespread horticultural rotations in regional environments, salads follow crops such as potatoes, tomatoes, parsley, celery and fennel.

For perennial horticultural crops (e.g. artichoke, asparagus) their return to the same plot requires a minimum interval of two years.

The cultivation of leaf and stem horticultural crops in protected environments can be released from the rotation obligations envisaged for open-field crops provided that, at least every other year, solarization interventions are carried out (lasting at least 60 days) or other non-chemical pest containment systems (green manure with biocidal crops, thermal treatments of the soil with steam or microwaves , application of antagonistic microorganisms as biocontrol agents towards numerous phytopathogenic agents). Pay attention to the cultivation operations of the previous crop, especially as regards weeding and defense against parasites.

5.2 Cultivation techniques: planting of crops (age, density, method)

The method of planting (age, density, method) must allow the achievement of adequate production yields by favoring the improvement of the efficiency of use of water and nutrients, of the competition against weeds and of the ability to defend against adversities .

Depending on the cultivation areas, the artichoke field, which traditionally takes place using carducci , can be carried out in autumn or spring, immediately after the scarducciatura operations . In environments characterized by more favorable climatic conditions, the practice of forcing the crop (early awakening and use of plant growth regulators) can be used to obtain very early (September) flower heads. The methods of installation follow guidelines linked to the practices in use locally. The planting density tends to vary between 7,000 and 9,000 plants ha-1. Plants can be made with seedlings obtained from the "seed" of recently established hybrids as well as from micropropagated seedlings .

Comply with the times, methods and planting densities indicated above. Adopt conservative and low-energy soil management techniques, up to implementing, where possible, no tillage or minimal tillage. Starting from the second year, cover the inter- rows with grass to preserve or increase the organic substance in the soil, to reduce negative phenomena (compaction, erosion, etc.).

5.3 Fertilization

The supply of fertilizing elements must maintain and improve soil fertility, compensate for crop removal and technically unavoidable losses on the basis of the physiological needs of the crop or according to the indications provided by soil or foliar analyses.

As regards nitrogen fertilization in the cultivation of early cultivars, the common practice provides for N contributions of 180-230 kg ha-1 divided into three applications (vegetative recovery, scarducciatura and emission of the first flower heads). In general, higher doses do not have positive effects on the crop . As an indication only, annual contributions of 70 to 170 kg ha-1 of P2O5 and 80 to 200 kg ha-1 of K2O are recommended based on the endowment of the land.

Verification of the availability of macroelements and the fertility of the plot concerned for cultivation by means of soil analysis in accredited laboratories every five years. Definition of a fertilization plan which identifies, by crop/cycle, quantity and timing of distribution, or adoption of the values, referring to individual crops, reported in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions .

5.4 Weed control

Weed control must be implemented by using, in the smallest possible quantity, products with the least impact on man and the environment, chosen among those with sufficient efficacy characteristics to guarantee the achievement of economically acceptable productions, taking into account their persistence and residual nature. . Agronomic strategies capable of guaranteeing the lowest environmental impact, within the framework of sustainable agriculture, are to be favoured.

In the early stages of crop growth or upon awakening when the size of the artichoke plants allow passage between the rows, it is possible to resort to mechanical weeding practices to control infestations of annual species. While the presence of biennial or perennial weeds, as well as the control of weeds on the row, finds in the various active principles with systemic and/or residual herbicide action valid solutions to contain the competition. In the period prior to planting or before the artichoke field awakens, it is possible to intervene with total action herbicides to control the weeds present on the plot, followed by a light tillage to facilitate transplanting operations. It is possible to provide herbicide treatments also in post-transplantation (15-20 days from the transplantation of the carducci) after having carried out a weeding between the rows. In this case, the treatment will be localized on the row using products with a mono- and dicotyledonous action or with an exclusive graminicide action if the crop is particularly infested with narrow-leaved weeds. The use of chemical weeding is possible

according to the provisions of the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions.

Weed control must be carried out compulsorily in accordance with the provisions of the Eco-Sustainable Standards for Phytosanitary Defense and control of weeds of agricultural crops approved by the Regions.

Recourse to a low use of active principles of chemical origin with a herbicidal action is allowed only when the adoption of agronomic techniques for weed control does not produce the desired effects.

5.5 Phytosanitary defence

The protection of the crop must be implemented using plant protection products in the smallest possible quantity, taking into account the persistence and residual nature of the active ingredients and choosing those with the least impact on the environment and the greatest efficacy.

When different techniques or strategies are possible, preference should be given to agronomic ones capable of guaranteeing the least environmental impact, within the framework of sustainable agriculture.

The practice of forcing the artichoke field exposes the crop to major attacks by aphids and nocturnal that can compromise production. Added to these are the damages deriving from the presence of gastropod molluscs (snails and slugs) which contribute to damaging the crop. The use of insecticide and molluscicide interventions in particular in forced crops is generally necessary. Another scourge for artichoke fields is the presence of voles which can cause considerable damage to the crop. Their control, as well as with processes and irrigation techniques for sliding such as to destroy or make the tunnels dug by rodents less hospitable,

can take place with the use of gnawing baits, more effective solutions. The diffusion of physical barriers represented by metal sheets

buried to delimit the plot interested in cultivation to prevent the passage of voles represents a valid alternative also in terms of environmental sustainability.

As far as the control of pathogenic fungi is concerned, endotherapeutic products are generally used for the control of hatred, while root rot and bacterial root rot essentially require preventive interventions mainly of an agronomic nature aimed at avoiding excessive vegetative vigor of the crop, as well as the use appropriate rotations, uninfected propagation material, possible disinfection of contaminated soils. Furthermore, there are several viral species isolated from the artichoke whose infections are often asymptomatic and for which today we have reclaimed and certified propagation material to guarantee the health of the propagation material. Specific phytosanitary aids for the defense of crops with chemical interventions are reported in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions.

Compliance with the technical guidelines for crop protection set out in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions is mandatory. Recourse to a low use of active ingredients of chemical origin with an antiparasitic action is allowed only when the main adversities are controlled through the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of suitable rotations crops, destruction of diseased crop residues, use of less susceptible varieties, etc.) does not produce the desired effects.

5.6 Irrigation

Irrigation must guarantee the satisfaction of the water needs of the crops through the adoption of practices that enhance the efficiency of the irrigation intervention and safeguard the environment.

The first irrigation of the artichoke field is carried out at the end of spring and beginning of summer to favor a rapid awakening of the crop and an advance of production. The irrigation season ends with the arrival of the winter rains and then resumes at the end of winter and guarantees good crop conditions until the end of the production cycle (May-June). On average, seasonal volumes fluctuate between 4,000 and 5,000 m3 ha-1.

It is necessary to document the volume of irrigation distributed for the entire crop cycle, providing in this case the indication of the start and end dates for irrigation.

If specialized business support provided by public administrations is available (e.g. irrigation cards or on-line computer programs), provide for the drafting of an irrigation plan.

5.7 Harvest and post-harvest (packaging and storage)

The methods of collection and delivery to the storage/processing centers must guarantee the maintenance of the best quality and wholesomeness characteristics of the products.

In the crops subjected to forcing, the harvest starts in September and lasts until May, in the others the production cycle is more contracted with the harvest starting in November. Normally the collection is manual with the possibility of having facilitators. The flower head is traditionally cut with a stem of about 20-30 cm and has one or more leaves, collected in bundles or arranged in boxes. For the product intended for large-scale distribution, the flower heads are collected with a shorter stem (10 cm) and without leaves and packaged in trays or bunches of variable numbers from 3 to 6.

Pre-refrigeration techniques (2-4°C) increase the storage time between harvesting and packaging as well as the "commercial life" of the flower heads. Temperatures of 0°C and

relative humidity of 90-95% without any additives allow the artichoke to be kept for 20-30 days. The collection of flower heads at the end of the season characterized by smaller dimensions finds industrial transformation as its main destination. The industrial processing of some recently established hybrids is directed towards the production of " artichoke hearts ", with the elimination of the outermost bracts of the flower head and a treatment for 90 seconds with a 1% lactic acid solution in order to guarantee conservation for about a week without causing browning and alteration of the organoleptic characteristics.

Respect of the times of shortage before the collection of the product; execution of post-harvest treatments exclusively with permitted products.

3.10 Production regulations of the “Cima di Cola”

Art. 1 – Name and historical notes

Cima di Cola: Source Almanacco BiodiverSO (2018). In Italy there are numerous local varieties of cauliflower, in fact our country has been, over the centuries, one of the most important centers of diversification of this species. This variety had been included in Annex 8 of the PSR Puglia 2007-2013 concerning regional indigenous genetic resources at risk of extinction.

Among the first reports we report that of Cesare Giulivi, 1984: Commercialization of Cauliflower on national and foreign markets. The national cauliflower conference. April 5, 1964, Fano. On the price list of the Bari Wholesale Fruit and Vegetable Market from different years, the indication “Cauliflower C. dicola per piece” and Cauliflower C. dicola al bundle” is given.

Local varieties of cauliflower are mentioned in the book of Horticulture (Bianco and Pimpini , 1990) which contains the following chapter: Bianco VV, 1990. Cauliflower (Brassica oleracea L. var. botrytis). In Bianco and Pimpini , 359-380. Patron Editore, Bologna (photo attached).

Art. 2 - Description and characteristics

Among the ancient varieties with green inflorescence, the Cima di cola is particularly renowned, the color of which is more precisely lemon green. The edible part of the Cima di cola is more spongy than the cauliflower varieties on the market and gives off a strong smell during cooking. DISAAT characterized this local variety by detecting the morphological descriptors defined by GIBA and determining the following characters in the laboratory: dry substance, ash, calcium, magnesium , potassium, sodium, boron, copper, iron, manganese, zinc, proteins, fibers , water-soluble vitamins, fat - soluble vitamins and glucosinolate profile . This local variety was characterized from an agronomic, morphological and molecular point of view using SNP markers (variation of single nucleotides of DNA) by the Institute of Biosciences

and Bioresources of the CNR of Bari. In June 2015 the Cima di cola was included in the national list of Traditional Agri-Food Products (PAT) thanks to the BiodiverSO project . Now it is also preserved in situ.

Plant: uniform morphotype ; during growth it has an elongated unbranched stem that ends with an enlarged floral or prefloral apex . Height 75cm, diameter 80cm. Medium length triangular root 15-20cm x 3-4cm.

Leaves: leaf length 70 cm, leaf blade width 35 cm, leaf angle approx. 67°, leaf blade ovate, leaf apex intermediate with medium thick entire leaf blade, leaf blade medium blistering, leaf tip pointing downwards , convex leaf blade curved upwards, leaf color dark green, peduncle and/or midrib broad and light green, petiole 5 cm x 1.5 cm x 15 mm.

Flowers: Medium sized exposed flower head in relation to plant size 20-25cm x 13-16cm, outwardly curved flower head leaves, outer leaves of flower head dark green, flower head medium in texture, inner cut light green , presence of axillary buds that remain quiescent, compact flower head made up of irregularly arranged supflowers . Spherical longitudinal section of inflorescence, broad and deep inflorescence with yellow surface, absence of bracts in inflorescence, low predisposition to early flowering, medium length of flower peduncle, medium branched flower stem, uniform yellow flower.

Fruits: 3-5 cm x 0.3-0.4 siliqua with erect attitude and narrow edge between the seeds, averagely 5 cm long rostrum, few seeds per siliqua (10 or less) with brown integument

Productive characteristics: harvest period: from October to January

Technological features: the edible part of the Cima di cola is more spongy than the cauliflower varieties on the market and gives off a strong odor during cooking.

Art. 3 - Production area

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Art. 4 – Retrieval of semen

National Research Council, Institute of Biosciences and BioResources (CNR-IBBR), Via G. Amendola 165/A, 70126 Bari

Art. 5 - Production techniques

5.1 Choice of land

The cultivation of leafy or stem vegetables should preferentially be carried out in environments with a Mediterranean climate on deep, well-drained medium-textured soils. In the case of multi-year cycle crops, such as artichoke and asparagus, permanence on the same plot of land for several years does not allow them to be included in a normal agricultural rotation, even if they are to be considered improvement crops. It is good not to let the crops follow themselves as well as the potato, carrot and sugar beet. The economic duration of the crop cycle depends on the phytosanitary state of the crop as well as on the consolidated practices in the various regional cultivation areas. Cauliflower, broccoli and turnip greens are generally considered catch crops following cereals, legumes and forage crops. Successions with the same species or others belonging to the same botanical family are to be avoided, as are rotations with Solanaceae, Umbelliferae and Cucurbitaceae due to phytopathological problems. Although fennel and celery alternate with different horticultural crops, it is preferable that they return to the same plot, after a period of 2 years, in succession to a crop that does not belong to the same botanical family. A good practice is to predict the return of lettuce to the same plot of land after 2-3 years. Among the most widespread horticultural rotations in regional environments, salads follow crops such as potatoes, tomatoes, parsley, celery and fennel.

For perennial horticultural crops (e.g. artichoke, asparagus) their return to the same plot requires a minimum interval of two years.

The cultivation of leaf and stem horticultural crops in protected environments can be released from the rotation obligations envisaged for open-field crops provided that, at least every other year, solarization interventions are carried out (lasting at least 60 days) or other non-chemical pest containment systems (green manure with biocidal crops, thermal treatments of the soil with steam or microwaves , application of antagonistic microorganisms as biocontrol agents towards numerous phytopathogenic agents). Pay attention to the cultivation operations of the previous crop, especially as regards weeding and defense against parasites.

5.2 Cultivation techniques: planting of crops (age, density, method)

The method of planting (age, density, method) must allow the achievement of adequate production yields by favoring the improvement of the efficiency of use of water and nutrients, of the competition against weeds and of the ability to defend against adversities .

Transplanting with 30-40 day seedlings with 5-6 leaves is the planting technique widely used for growing cauliflower. Operation that can be performed manually or with the use of simple row transplanters by adopting variable distances.

When using early and medium cycle cultivars, transplanting takes place between mid-July and mid-August, while for late productions with longer cycle cultivars, transplants can be continued until the first ten days of September.

The crop investment varies according to the length of the crop cycle and the destination. For the earliest cultivars and/or for an industrial destination of the product, higher planting densities are preferred, 20,000 - 35,000 plants ha-1, while for late productions and/or for the fresh market, a lower density is preferred, 15,000 - 20,000 plants ha -1. The distance between the rows, therefore, varies between 60 and 100 cm, while on the row between 50 and 70 cm.

Comply with the times, methods and planting densities indicated above. Adopt conservative and low-energy soil management techniques, up to implementing, where possible, no tillage or minimal tillage. Starting from the second year, cover the inter- rows with grass to preserve or increase the organic substance in the soil, to reduce negative phenomena (compaction, erosion, etc.).

5.3 Fertilization

The supply of fertilizing elements must maintain and improve soil fertility, compensate for crop removal and technically unavoidable losses on the basis of the physiological needs of the crop or according to the indications provided by soil or foliar analyses.

The nutrient that most affects the production of cabbage is nitrogen. In general, a nitrogen supply of 130-160 kg ha-1 is to be considered optimal, divided after transplanting, approximately 20 days after transplanting and after approximately one month in the case of early cultivars and later if late.

Fundamental is an adequate availability of phosphorus to have balanced growth of the vegetation, good precocity and contemporaneity of ripening, as well as potassium to increase the resistance of plants to frost and a higher compactness of the corymb.

For average productions of 25 t ha-1 of corymbs, a supply of 50 kg ha-1 of P2O5 and 200 kg ha-1 of K2O should be foreseen. Annual contributions of 0 to 100 kg ha-1 of P2O5 and 0 to 200 kg ha-1 of K2O are recommended according to the endowment of the land. Poor management of the crop nutrition plan and micronutrient deficiencies can generate physiopathies (appearance of "hair", "cavity of the central axis" and "patchy browning" of the corymb, anomalous development of axillary shoots, "buttoning", flaking leaf and chlorosis) to the detriment of the quantity and quality of the product.

Verification of the availability of macroelements and the fertility of the plot concerned for cultivation by means of soil analysis in accredited laboratories every five years. Definition of a fertilization plan which identifies, by crop/cycle, quantity and timing of distribution, or adoption of the values, referring to individual crops, reported in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions .

5.4 Weed control

Weed control must be implemented by using, in the smallest possible quantity, products with the least impact on man and the environment, chosen among those with sufficient efficacy characteristics to guarantee the achievement of economically acceptable productions, taking into account their persistence and residual nature. . Agronomic strategies capable of guaranteeing the lowest environmental impact, within the framework of sustainable agriculture, are to be favoured.

Weed control, as well as resorting to the implementation of good agricultural practices (crop rotation, false sowing, etc.) can be carried out in the first period of the cycle with mechanical weeding or chemical interventions according to the provisions of the Eco-Sustainable Standards for Defense Phytosanitary and weed control of agricultural crops approved by the Regions.

Weed control must be carried out compulsorily in accordance with the provisions of the Eco-Sustainable Standards for Phytosanitary Defense and control of weeds of agricultural crops approved by the Regions.

Recourse to a low use of active principles of chemical origin with a herbicidal action is allowed only when the adoption of agronomic techniques for weed control does not produce the desired effects.

5.5 Phytosanitary defence

The protection of the crop must be implemented using plant protection products in the smallest possible quantity, taking into account the persistence and residual nature of the active ingredients and choosing those with the least impact on the environment and the greatest effectiveness.

When different techniques or strategies are possible, preference should be given to agronomic ones capable of guaranteeing the least environmental impact, within the framework of sustainable agriculture.

The control of the main adversities must provide for the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of appropriate crop rotations, destroying the residues of diseased crops, use of healthy seed, use of less susceptible varieties , etc..). Specific phytosanitary aids for the defense of crops with chemical interventions are reported in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions.

Compliance with the technical guidelines for crop protection set out in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions is mandatory. Recourse to a low use of active ingredients of chemical origin with an antiparasitic action is allowed only when the main adversities are controlled through the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of suitable rotations crops, destruction of diseased crop residues, use of less susceptible varieties, etc.) does not produce the desired effects.

5.6 Irrigation

Irrigation must guarantee the satisfaction of the water needs of the crops through the adoption of practices that enhance the efficiency of the irrigation intervention and safeguard the environment.

A good and constant availability of water in the soil is essential for the success of the crop, a condition mainly guaranteed by the frequency of natural water supplies during the crop cycle (autumn-winter).

The use of irrigation is essential immediately after the transplant to favor the engraftment of the young seedlings (100-150 m3 ha-1) and in the first phases of the cycle, if no useful rain events should occur, with supplies of 250-350 m3 ha-1 per intervention. Localized irrigation systems are to be preferred for the best efficiency of the irrigation supply and of the supply of nutrients if the practice of fertigation is adopted and for the absence of wetting of the foliage with phytosanitary advantages.

It is necessary to document the volume of irrigation distributed for the entire crop cycle, providing in this case the indication of the start and end dates for irrigation.

If specialized business support provided by public administrations is available (e.g. irrigation cards or on-line computer programs), provide for the drafting of an irrigation plan.

5.7 Harvest and post-harvest (packaging and storage)

The methods of collection and delivery to the storage/processing centers must guarantee the maintenance of the best quality and wholesomeness characteristics of the products.

The cauliflower is ready to be harvested starting from mid-September for the early cultivars until spring for the later ones, when the corymbs have reached a development, in weight and size, and a suitable appearance from a commercial point of view. The collection of the corymb, generally done by hand with a cut at the collar, proceeds with the partial elimination of the stem and leaves according to the needs of the market. From 2 to 6 passages are necessary for

the collection of one hectare of cauliflower following the gradual ripening, less accentuated for hybrids, which in some way limit the diffusion of facilitating machines. Immediately after harvesting, the product is pre -refrigerated to bring it to a temperature of 5°C before being stored in a ventilated cold room with relative humidity > 95%. The corymbs thus treated can be stored for a period of 10-15 days depending on the storage temperature which must be between 3 and 5°C.

Respect of the times of shortage before the collection of the product; execution of post-harvest treatments exclusively with permitted products.

3.11 Production specification of the " Eypean with the Occhiopinto "

Art. 1 – Name and historical notes

Cowpea Occhiopinto : Source BiodiverSO Almanac (2018). The black-eyed bean, known in the Bari area with the local name of Fagiolino pinto and Occhiopinto , is a typical Apulian crop, almost not widespread in other regions. The species is of African origin; already known and consumed since the times of the ancient Romans, who called it “ Phaseolus ”. It was found in the province of Bari, in Conversano, Putignano and Locorotondo The black-eyed bean or pinto bean is a species of African origin and has been present in Puglia since ancient times. The types with cream colored seeds with a black eye (area around the hilum) are widespread above all in Salento. The pinto bean has been cultivated in Puglia since time immemorial and belongs to the agronomic tradition which adopts cultivation techniques consolidated over time and typical cultural references. The quotations, even if with generic nomenclatures of Fagiolino pinto, in the works of classical antiquity especially Roman (works of Apicius , etc.) and of the Middle Ages (Charlemagne), however, do not report precise territorial references.

Art. 2 - Description and characteristics

It is a plant grown as a fresh vegetable only in some regions of central-southern Italy. The most common type has cream-colored seeds with a spot, "eye", around the hilum, but there are other local varieties with seeds of different colors, or with mixtures of seeds of different shapes and colors. The plant, with determined development, has an upright growth habit. The flower is white, while the pods are narrow and long, of medium size, green in color with a purple tip. The production is medium-low. The seeds are ovoid to rhomboid in shape with rough to wrinkled and cream colored integument with a small black area around the hilum. This local variety has been characterized from an agronomic, morphological and molecular point of view using SSR markers (single sequence repeat) and SNP (variation of single nucleotides of DNA) from the Institute of Biosciences and Bioresources of the CNR of Bari. DISAAT has registered

the black-eyed bean in the national list of PATs and determined the following characters: dry matter, ash , calcium, magnesium, potassium, sodium, boron, copper, iron, manganese, zinc, proteins, fibers, water-soluble vitamins and fat-soluble vitamins.

Plant: upright-acute type growth, moderate pigmentation at the base and tip of the petiole,

Leaves: globe-shaped terminal leaflet, with glabrescence .

Flowers: flowering about 26 days after sowing, raceme positioned between the canopies, white.

Pod: ripening about 91 days after sowing, pod hanging from the stalk, pigmented tip of immature pod, mature pod slightly curved about 14.5 cm long and about 0.74 cm wide, having about 11 loculi per pod, mature pod of light brown or straw color.

Seed: ovoid shape, rough to wrinkled head, small eye turning from blue to black, cream colored integument, about 7.5 mm long, about 5.5 mm wide.

Harvest period: May-June

Much appreciated in Puglia and is used in recipes linked to the local tradition.

Art. 3 - Production area

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Art. 4 – Retrieval of semen

National Research Council, Institute of Biosciences and BioResources (CNR-IBBR), Via G. Amendola 165/A, 70126 Bari

Art. 5 - Production techniques

5.1 Choice of land

The cultivation of fruit vegetables prefers environments with a Mediterranean climate, soils with good fertility, medium texture and well drained.

It is good practice in horticulture never to make the crops succeed themselves and in the context of crop rotations, alternate species that require deep tillage with others with a more superficial root system and which therefore require less depth of tillage.

Specifically, it is inadvisable for cucurbits (watermelon, melon, carosello, zucchini) to return to the same plot before 3-4 years; in general they can follow winter horticultural crops or wheat.

Also for the green bean, avoid returning to the same plot before 3-4 years, just as a rotation with other legumes should be avoided. In mixed production systems, the green bean can precede a cereal or follow it as a catch crop.

Solanaceae (aubergine, pepper, tomato), in areas characterized by specialized horticulture, can alternate with all winter-spring cycle horticultural crops (fennel, lettuce, brassicaceae, etc.). The return to the same plot of solanaceous plants (tomatoes, aubergines, peppers) before 3-4 years is absolutely to be avoided.

In programs for the production of vegetables in the open field, for industrial use, Solanaceae are rotated as renewal crops alternating with cereals.

For fruit crops with a short cycle (2-3 months), rotations with the same species or others belonging to the same botanical family should be avoided within the same year, unless there is a rest period of sixty days between and the other.

The cultivation of horticultural crops from leaves and stems in protected environments can be released from the rotation obligations envisaged for crops grown in open fields provided that, at least every other year, the following are carried out:

- solarization interventions (minimum duration of 60 days)

- other non-chemical pest containment systems (e.g. green manure with biocidal crops, thermal treatments of the soil with steam or microwaves , application of antagonistic microorganisms such as biocontrol agents towards numerous phytopathogenic agents).

Land intended for the cultivation of fruit-bearing horticultural crops must be located at a safe distance (not less than 500 m) from potential sources of diffusion of contaminants into the soil.

5.2 Cultivation techniques: planting of crops (age, density, method)

The planting method (soil tillage, period, density, method) must allow the achievement of adequate production yields, favoring the improvement of water and nutrient use efficiency, competition against weeds and the capacity defense against adversity. The preparation of the soil before planting the crops must be carried out according to methods that take into account the texture and fertility of the soil, the climatic characteristics of the area and the cultivation needs of the species. Two-layer tillages with dividing organs are preferable to avoid turning the layers of soil and reduce soil disturbance to a minimum, followed by refinement tillage to break up the clods, level the surface, make the soil uniform, bury any weeds and to limit moisture losses in the surface layers.

For the green bean it is common practice, especially in the industrial product, to resort to direct sowing with the aid of seeders, regulating the distance between the rows in relation to the type of harvesting machine. The sowing period falls between the end of March and the beginning of April. In general, for a product for fresh consumption, early sowing is preferred, while for an industrial product it is possible to plan for later sowing, avoiding excessively hot periods.

Currently, front harvesting machines require a spacing between rows of 0.30-0.40 m and on the row of 0.07-0.10 m, this also in consideration of the type of dwarf bean most suitable for industrial use.

Green bean plantings for fresh consumption, depending on the cultivar, climbing or dwarf, generally require a distance between the rows of about 1.00 m and between 0.05-0.10 m and 0.35-0.50 m on the row, depending on whether seed sowing is carried out single or in small groups .

Comply with the times, methods and planting densities indicated above. Adopt conservative and low-energy soil management techniques, up to implementing, where possible, no tillage or minimal tillage.

Starting from the second year, cover the inter- rows with grass to preserve or increase the organic substance in the soil, to reduce negative phenomena (compaction, erosion, etc.).

5.3 Fertilization

The supply of fertilizing elements must maintain and improve soil fertility, compensate for crop removal and technically unavoidable losses on the basis of the physiological needs of the crop or according to the indications provided by soil or foliar analyses.

The green bean is a legume and although sensitive to the availability of nitrogen, part of this element is made available through symbiotic bacteria which allow atmospheric nitrogen to be fixed and made available to the plant.

The supply of nitrogen , , must be rather limited in doses which must not exceed 90 kg ha-1, distributed for the most part in pre-sowing (2/3), and partly at the stage of 2-3 true leaves, with starter function to cover the phase in which the symbiotic bacteria are not yet fully active.

Phosphate and potash fertilizations must be carried out at the time of planting. The phosphorus requirements appear somewhat limited and covered by contributions of 50-80 kg ha-1 of P2O5, while the availability of potassium is important, which must always be higher than that of nitrogen to avoid facilitating a greater sensitivity to fungal attacks. The

recommended dose is 120-150 kg ha-1 of K2O. Annual contributions of 50 to 90 kg ha-1 of P2O5 and 40 to 100 kg ha-1 of K2O are recommended according to the endowment of the land.

Verification of the availability of macroelements and the fertility of the plot concerned for cultivation by means of soil analysis in accredited laboratories every five years.

Definition of a fertilization plan which identifies, by crop/cycle, quantity and timing of distribution, or adoption of the values, referring to individual crops, reported in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions .

Among the organic fertilizers, only the use of quality compost, livestock effluents and wastewater from small agri-food companies is permitted, in the manner established by the national legislation in force.

5.4 Weed control

Weed control must be implemented using minimum doses of products with low impact on humans and the environment, chosen from those with greater efficacy and low persistence and residual nature.

Agronomic and/or biological strategies capable of guaranteeing the lowest environmental impact, within the framework of sustainable agriculture, are to be favoured.

The weed control of the green bean involves the use of one or more weeding, at intervals of about 20 days starting from the moment in which the plants have overcome the transplant crisis. AND' it is advisable to proceed with rather light mechanical interventions to avoid damage to the mainly superficial roots.

Chemical weeding in the cultivation of green beans is possible according to the provisions of the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions.

Weed control must be carried out compulsorily in accordance with the provisions of the Eco-Sustainable Standards for Phytosanitary Defense and control of weeds of agricultural crops approved by the Regions.

Recourse to a low use of active principles of chemical origin with a herbicidal action is allowed only when the adoption of agronomic techniques for weed control does not produce the desired effects.

5.5 Phytosanitary defence

The protection of the crop must be implemented using plant protection products in the smallest possible quantity, taking into account the persistence and residual nature of the active ingredients and choosing those with the least impact on the environment and the most effective.

When different techniques or strategies are possible, preference should be given to agronomic and/or biological ones, within the framework of sustainable agriculture.

Among these, the use of herbaceous grafting with resistant or tolerant rootstocks represents a valid alternative to the containment of fusariosis, verticillium and nematode attacks.

At the base of a good defense of the crop, in the absence of resistant cultivars, the adoption of preventive agronomic measures (use healthy propagation material, carry out wide crop rotations, adopt balanced fertilization plans and remove and destroy the infected residues) appears essential for the success of the crop.

When symptoms appear or in the presence of climatic conditions predisposing the onset of fungal diseases or insect attacks, it is possible to resort to the use of phytosanitary products listed in the Eco-Sustainable Standards for Phytosanitary Defense and Weed Control of agricultural crops approved by the Regions.

Compliance with the technical guidelines for crop protection listed in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions is mandatory.

Recourse to a low use of active ingredients of chemical origin with an antiparasitic action is allowed only when the main adversities are controlled through the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of suitable rotations crops, destruction of diseased crop residues, use of less susceptible varieties, etc.) does not produce the desired effects.

5.6 Irrigation

Irrigation must guarantee the satisfaction of the water needs of the crops through the adoption of practices that enhance the efficiency of the irrigation intervention and safeguard the environment.

The cultivation of the green bean requires a high and constant availability of water in order to obtain quality products. The crop is particularly sensitive to water availability during flowering and fruit enlargement.

Localized irrigation systems are to be preferred for the best efficiency of the irrigation supply and of the supply of nutrients if the practice of fertigation is adopted. In relation to the cultivation environment and the seasonal trend, the watering volumes and shifts will have to be evaluated. In general, the water requirement of the crop varies from 2,500 to 5,000 m3 ha-1 which can be distributed with 5 – 10 irrigation interventions. It is necessary to document the

volume of irrigation distributed for the entire crop cycle, providing for the indication of the start and end dates for irrigation.

If specialized business support provided by public administrations is available (e.g. irrigation cards or on-line computer programs), provide for the drafting of an irrigation plan.

5.7 Harvest and post-harvest (packaging and storage)

The methods of collection and delivery to the storage/processing centers must guarantee the maintenance of the best quality and wholesomeness characteristics of the products.

The harvesting period of the green bean for the fresh market takes place gradually when the pod has reached about 75% of its maximum size.

The product to be destined for industry is harvested with self-propelled harvesting machines when the weight ratio of the seed to the pod fluctuates between 5 and 10%.

In order to avoid a rapid deterioration of the product it is important to lower its temperature to 5°C with refrigeration in water.

Conservation in cold rooms at 4-7° C, with relative humidity of 90-95% is possible for a period of about two weeks.

Respect of the times of shortage before the collection of the product; execution of post-harvest treatments exclusively with permitted products.

3.12 Production specification of the "Bean pinto by the metre"

Art. 1 – Name and historical notes

Pinto bean : Source BiodiverSO Almanac (2018). The Pinto bean a meter is a subspecies of Vigna unguiculata , of African origin. Once widespread in the province of Bari and probably also in other Apulian provinces. Very rare today, it is grown almost exclusively in small plots of land or in family gardens. The pinto bean has been cultivated in Puglia since time immemorial and belongs to the agronomic tradition which adopts cultivation techniques consolidated over time and typical cultural references. The quotations, even if with generic nomenclatures of Fagiolino pinto, in the works of classical antiquity especially Roman (works of Apicius , etc.) and of the Middle Ages (Charlemagne), however, do not report precise territorial references. The first missions carried out by explorers of the Germplasm Institute (now the Institute of Biosciences and Bioresources) of the National Research Council, dedicated exclusively to finding varieties of Pinto bean in Puglia, date back to 1986. In those explorations, the samples found, kept in the seed bank of the then Istituto del Germoplasma of the CNR, presented seeds of different colors/patterns (for example black seeds, or cream-colored seeds with the eye, i.e. the area around the hilum, black). During the same exploration missions samples belonging to the Vigna unguiculata were also found susp . sesquipedalis , characterized by very long pods (pinto bean per metre).

Art. 2 - Description and characteristics

The Pinto bean by the meter is so called (“by the metre”) due to the unusual length of the pod, which can reach up to one metre. It stands out above all for the climbing habit of the plant which allows the pods to extend in length. The reniform seed is normally brick-red in color, but black meter bean seeds have also been described. The culinary preparations used in Puglia are the same as for the other non-climbing varieties of pinti beans. The Pinto Bean per meter plant has indeterminate growth and climbing habit, narrow and very long pods (up to 100 cm), green

in color and with an average production. The reniform and elongated seeds are brick red in color while the flower is white. This local variety has been characterized from an agronomic, morphological and molecular point of view using SSR markers (single sequence repeat) and SNP (variation of single nucleotides of DNA) from the Institute of Biosciences and Bioresources of the CNR of Bari.

Plant: climbing type growth, very light pigmentation.

Leaf: globe-shaped terminal leaflet, presence of glabrescence .

Flower: flowering about 58 days after sowing, raceme positioned between the canopies, white colour.

Pod: ripening about 87 days after sowing, pod hanging from the stalk, pigmented tip of immature pod, mature pod slightly curved about 31 cm long and about 0.81 cm wide, having about 21 loculi per pod, mature pod brownish in color dark.

Seed: kidney-shaped, smooth head, brown integument, about 11 mm long, about 6.1 mm wide.

Harvest period: May-June. Narrow and very long pods (up to 100 cm), green in color and with an average production. It's rustic.

Much appreciated in Puglia, although now very rare. The culinary preparations used in Puglia are the same as for the other non-climbing varieties of pinti beans.

Art. 3 - Production area

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Art. 4 – Retrieval of semen

National Research Council, Institute of Biosciences and BioResources (CNR-IBBR), Via G. Amendola 165/A, 70126 Bari

Art. 5 - Production techniques

5.1 Choice of land

The cultivation of fruit vegetables prefers environments with a Mediterranean climate, soils with good fertility, medium texture and well drained.

It is good practice in horticulture never to make the crops succeed themselves and in the context of crop rotations, alternate species that require deep tillage with others with a more superficial root system and which therefore require less depth of tillage.

Specifically, it is inadvisable for cucurbits (watermelon, melon, carosello, zucchini) to return to the same plot before 3-4 years; in general they can follow winter horticultural crops or wheat.

Also for the green bean, avoid returning to the same plot before 3-4 years, just as a rotation with other legumes should be avoided. In mixed production systems, the green bean can precede a cereal or follow it as a catch crop.

Solanaceae (aubergine, pepper, tomato), in areas characterized by specialized horticulture, can alternate with all winter-spring cycle horticultural crops (fennel, lettuce, brassicaceae, etc.). The return to the same plot of solanaceous plants (tomatoes, aubergines, peppers) before 3-4 years is absolutely to be avoided.

In programs for the production of vegetables in the open field, for industrial use, Solanaceae are rotated as renewal crops alternating with cereals.

For fruit crops with a short cycle (2-3 months), rotations with the same species or others belonging to the same botanical family should be avoided within the same year, unless there is a rest period of sixty days between and the other.

The cultivation of horticultural crops from leaves and stems in protected environments can be released from the rotation obligations envisaged for crops grown in open fields provided that, at least every other year, the following are carried out:

- solarization interventions (minimum duration of 60 days)

- other non-chemical pest containment systems (e.g. green manure with biocidal crops, thermal treatments of the soil with steam or microwaves , application of antagonistic microorganisms such as biocontrol agents towards numerous phytopathogenic agents).

Land intended for the cultivation of fruit-bearing horticultural crops must be located at a safe distance (not less than 500 m) from potential sources of diffusion of contaminants in the soil.

5.2 Cultivation techniques: planting of crops (age, density, method)

The planting method (soil tillage, period, density, method) must allow the achievement of adequate production yields, favoring the improvement of water and nutrient use efficiency, competition against weeds and the capacity defense against adversity. The preparation of the soil before planting the crops must be carried out according to methods that take into account the texture and fertility of the soil, the climatic characteristics of the area and the cultivation needs of the species. Two-layer tillages with dividing organs are preferable to avoid turning the layers of soil and reduce soil disturbance to a minimum, followed by refinement tillage to break up the clods, level the surface, make the soil uniform, bury any weeds and to limit moisture losses in the surface layers.

For the green bean it is common practice, especially in the industrial product, to resort to direct sowing with the aid of seeders, regulating the distance between the rows in relation to the type of harvesting machine. The sowing period falls between the end of March and the beginning of April. In general, for a product for fresh consumption, early sowing is preferred,

while for an industrial product it is possible to plan for later sowing, avoiding excessively hot periods.

Currently, front harvesting machines require a spacing between rows of 0.30-0.40 m and on the row of 0.07-0.10 m, this also in consideration of the type of dwarf bean most suitable for industrial use.

Green bean plantings for fresh consumption, depending on the cultivar, climbing or dwarf, generally require a distance between the rows of about 1.00 m and between 0.05-0.10 m and 0.35-0.50 m on the row, depending on whether seed sowing is carried out single or in small groups .

Comply with the times, methods and planting densities indicated above. Adopt conservative and low-energy soil management techniques, up to implementing, where possible, no tillage or minimum tillage.

Starting from the second year, cover the inter- rows with grass to preserve or increase the organic substance in the soil, to reduce negative phenomena (compaction, erosion, etc.).

5.3 Fertilization

The supply of fertilizing elements must maintain and improve soil fertility, compensate for crop removal and technically unavoidable losses on the basis of the physiological needs of the crop or according to the indications provided by soil or foliar analyses.

The green bean is a legume and although sensitive to the availability of nitrogen, part of this element is made available through symbiotic bacteria which allow atmospheric nitrogen to be fixed and made available to the plant.

The supply of nitrogen , , must be rather limited in doses which must not exceed 90 kg ha-1, distributed for the most part in pre-sowing (2/3), and partly at the stage of 2-3 true leaves, with starter function to cover the phase in which the symbiotic bacteria are not yet fully active.

Phosphate and potash fertilizations must be carried out at the time of planting. The phosphorus requirements appear somewhat limited and covered by contributions of 50-80 kg ha-1 of P2O5, while the availability of potassium is important, which must always be higher than that of nitrogen to avoid facilitating a greater sensitivity to fungal attacks. The recommended dose is 120-150 kg ha-1 of K2O. Annual contributions of 50 to 90 kg ha-1 of P2O5 and 40 to 100 kg ha-1 of K2O are recommended according to the endowment of the land.

Verification of the availability of macroelements and the fertility of the plot concerned for cultivation by means of soil analysis in accredited laboratories every five years.

Definition of a fertilization plan which identifies, by crop/cycle, quantity and timing of distribution, or adoption of the values, referring to individual crops, reported in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions .

Among the organic fertilizers, only the use of quality compost, livestock effluents and wastewater from small agri-food companies is permitted, in the manner established by the national legislation in force.

5.4 Weed control

Weed control must be implemented using minimum doses of products with low impact on humans and the environment, chosen from those with greater efficacy and low persistence and residual nature.

Agronomic and/or biological strategies capable of guaranteeing the lowest environmental impact, within the framework of sustainable agriculture, are to be favoured.

The weed control of the green bean involves the use of one or more weeding, at intervals of about 20 days starting from the moment in which the plants have overcome the transplant crisis. It is advisable to proceed with rather light mechanical interventions to avoid damage to the mainly superficial roots.

Chemical weeding in the cultivation of green beans is possible according to the provisions of the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions.

Weed control must be carried out compulsorily in accordance with the provisions of the Eco-Sustainable Standards for Phytosanitary Defense and control of weeds of agricultural crops approved by the Regions.

Recourse to a low use of active principles of chemical origin with a herbicidal action is allowed only when the adoption of agronomic techniques for weed control does not produce the desired effects.

5.5 Phytosanitary defence

The protection of the crop must be implemented using plant protection products in the smallest possible quantity, taking into account the persistence and residual nature of the active ingredients and choosing those with the least impact on the environment and the most effective.

When different techniques or strategies are possible, preference should be given to agronomic and/or biological ones, within the framework of sustainable agriculture.

Among these, the use of herbaceous grafting with resistant or tolerant rootstocks represents a valid alternative to the containment of fusariosis, verticillium and nematode attacks.

At the base of a good defense of the crop, in the absence of resistant cultivars, the adoption of preventive agronomic measures (use healthy propagation material, carry out wide crop rotations, adopt balanced fertilization plans and remove and destroy the infected residues) appears essential for the success of the crop.

When symptoms appear or in the presence of climatic conditions predisposing the onset of fungal diseases or insect attacks, it is possible to resort to the use of phytosanitary products listed in the Eco-Sustainable Standards for Phytosanitary Defense and Weed Control of agricultural crops approved by the Regions.

Compliance with the technical guidelines for crop protection listed in the Eco-sustainable standards for phytosanitary defense and weed control of agricultural crops approved by the Regions is mandatory.

Recourse to a low use of active ingredients of chemical origin with an antiparasitic action is allowed only when the main adversities are controlled through the adoption of preventive measures, such as agronomic means (reduction of fertilizations, reduction of stagnant humidity, adoption of suitable rotations crops, destruction of diseased crop residues, use of less susceptible varieties, etc.) does not produce the desired effects.

5.6 Irrigation

Irrigation must guarantee the satisfaction of the water needs of the crops through the adoption of practices that enhance the efficiency of the irrigation intervention and safeguard the environment.

The cultivation of the green bean requires a high and constant availability of water in order to obtain quality products. The crop is particularly sensitive to water availability during flowering and fruit enlargement.

Localized irrigation systems are to be preferred for the best efficiency of the irrigation supply and of the supply of nutrients if the practice of fertigation is adopted. In relation to the cultivation environment and the seasonal trend, the watering volumes and shifts will have to be evaluated.

In general, the water requirement of the crop varies from 2,500 to 5,000 m3 ha-1 which can be distributed with 5 – 10 irrigation interventions.

It is necessary to document the volume of irrigation distributed for the entire crop cycle, providing for the indication of the start and end dates for irrigation.

If specialized business support provided by public administrations is available (e.g. irrigation cards or on-line computer programs), provide for the drafting of an irrigation plan.

5.7 Harvest and post-harvest (packaging and storage)

The methods of collection and delivery to the storage/processing centers must guarantee the maintenance of the best quality and wholesomeness characteristics of the products.

The harvesting period of the green bean for the fresh market takes place gradually when the pod has reached about 75% of its maximum size.

The product to be destined for industry is harvested with self-propelled harvesting machines when the weight ratio of the seed to the pod fluctuates between 5 and 10%.

In order to avoid a rapid deterioration of the product it is important to lower its temperature to 5°C with refrigeration in water.

Conservation in cold rooms at 4-7° C, with relative humidity of 90-95% is possible for a period of about two weeks.

Respect of the times of shortage before the collection of the product; execution of post-harvest treatments exclusively with permitted products.

3.13 Production regulations of the “Vite Cigliola ”

Art. 1 – Name and historical notes

Cigliola : found in various localities of Salento and in Sava. It is the denomination of a vine historically cultivated in Salento, known in Martina Franca (TA) as Uva attina . Thanks to the matching of the genetic profiles, we know that this variety has also recently been identified in Basilicata with the synonym Agostinella (Alba et al., 2016). Bibliographic sources testify to the presence of the Cigliola in the Terra d'Otranto, in particular in the territories of Taranto and Lecce (Licci, 1877; Di Rovasenda, 1887); it has recently been identified with the same name in the countryside of Melendugno (LE), while in Martina Franca (TA) and in the Valle d'Itria the Cigliola is called Uva attina (Martelli et al., 1980). Among the manuscripts of the Fondo Di Rovasenda (1856-1913), conserved at the DISAFA of the University of Turin, there are the unpublished descriptions of a white Cigliese from Altamura and of an Attigno or Uva di San Pietro, the latter, with “early, crunchy, white berry, ripening at the same time as Moscato”. Both are well matched to the Cigliola .

The white Cigliola is a denomination found in Salento, where associated with it numerous accessions and oral testimonies of local farmers have been identified and characterized during the research operations in the context of the integrated project of Recovery of Apulian Viticolous Germplasm (Re.Ge. Vi.P).

Knowledge in the Apulian population of the name of Cigliola bianca was the greatest, followed by that of Uva Attina . The geographical area of discovery of the first denomination (Cigliola bianca) was also the largest.

The same vine is present with other denominations in different wine-growing areas of the Puglia region:

- Uva Attina in Valle d'Itria (Prov. Bari, Brindisi and Taranto) (Martelli et al., 1980)

- White Cigliese in Altamura (Di Rovasenda, 1856-1913)
- Attigno or grape of San Pietro delle Puglie (Di Rovasenda, 1856-1913)

Art. 2 - Description and characteristics

9 accessions of the white Cigliola vine known as Uva Attina were recovered in the relative traditional cultivation area. The accessions were studied in the collection fields of the Regional Center for the Conservation of Germplasm in the countryside of Locorotondo.

Plant: upright habit; tendrils distributed on the branch in a discontinuous manner; dorsal and ventral side of internodes lightly streaked green;

Leaf: pinkish-green young leaf with a strong density of creeping hairs between the veins of the lower page;

Adult leaf: medium-small size; pentagonal flap; presence of five weakly depressed lobes; anthocyanin pigmentation of main veins only at petiole point ; flat profile; medium blistering of the upper page of the flap; medium sized convex teeth; open petiole sinus ; absence of teeth on the edge of the petiole sinus ; low density of creeping hairs between the main veins (underside); low density of erect hairs between the main veins (underside);

Flowers: Flower bud with open tip; absence of anthocyanin pigmentation of the creeping hairs of the extremity; high density of creeping extremity hairs;

Inflorescence: hermaphroditic flower; 2 to 3 inflorescences per shoot; high fertility of the basal buds of the shoot;

Fruits: Bunch when ripe: medium length and compactness; conical shape;

Grape when ripe: medium-short size; ellipsoidal shape ; green-yellow epidermis; thick skin; slightly firm pulp; presence of seeds;

Productive characteristics: average vigor of the branch; medium internode length; medium-low grape and bunch weight; average production of grapes per m2; high or very-high sugar content of the must; low or very low total acidity of the must; very high wort pH; characterized by early phenological phases, starting from budding; the phases of flowering, veraison and finally maturation take place in an early period. Productivity is regular and constant, good fertility.

Technological characteristics: the wine obtained is characterized by a fairly intense, clear straw yellow colour, it has a moderate olfactory intensity characterized above all by floral (rose, violet) and herbaceous notes based on fresh grass, hay and even sweet almond, while slight but the fruity scents are very pleasant, especially apricot and peach. The good alcohol content and structure are accompanied by an excellent balance and gustatory persistence, for which the vine lends itself very well as a base for table wines to be accompanied preferably with fish-based dishes.

Art. 3 - Production area

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Art. 4 – Finding of plant material

Research, Experimentation and Training Center in Agriculture Basile Caramia, Via Cisternino, 281 - 70010 Locorotondo (BA)

Art. 5 – Rules for viticulture and winemaking

The environmental and cultivation conditions of the vineyards destined for the production of wine must be the traditional ones of the area. The maximum production of grapes per hectare of vineyard, in specialized cultivation within the company, must not be higher respectively for the wines with typical geographical indication "Puglia" white, red and rosé, at 26 tons;

As regards the yield per hectare in mixed cultivation, this must be related to that of specialized cultivation taking into account the effective number of vines.

The grapes destined for the production of wines must ensure that the wines have a minimum natural alcoholic strength by volume:

9.5% vol for whites;

9.5% vol for rosés;

10.00% vol for reds.

The grapes destined for the production of the sparkling and sparkling types can, by way of derogation, ensure a minimum natural alcoholic strength by volume of less than 0.5% vol. The grapes destined for the production of "wine of overripe grapes" must ensure a minimum natural alcoholic strength by volume of 15.00% vol. In the case of particularly unfavorable years, these values can be reduced by 0.5% vol.

In vinification, only those practices which give the wines their own particular characteristics are allowed. The maximum yield of grapes in finished wine, ready for consumption, must not exceed 80%, for all types of wine, with the exception of passito and/or overripe grapes for which it must not exceed 50% . Withering on the plant is also permitted.

3.14 Production regulations of the “ Notardomenico vine ”

Art. 1 – Name and historical notes

Notardomenico : Of the Notardomenico variety there is relevant historical information. Notardomenico is mentioned by some authors of the late 1800s (Perelli, 1874; De Rovasenda, 1997; Fonseca, 1892). According to Perelli (1874) it is a "vine that supplies alcoholic and colored wine, it is grown on a small scale in Martina, Gioia del Colle, etc." The same vine was present with other denominations in different wine-growing areas of the Puglia region, such as Guara Domenico, Nero Domenico, Pier Domenico, So' Nicola, Gallioppo (Frojo , 1878; Frojo 1883). The alternative denomination best known in the Province of Lecce is San Nicola which Frojo (1875) refers to as Sor Nicola, outlining the main morphological characteristics of the Notardomenico vine . The denomination Notardomenico is mentioned by some authors after the middle of the 19th century (Perelli, 1874; De Rovasenda 1887; Fonseca 1892) and probably the same variety was known in the Bari district also with the synonyms Guara Domenico, Nero Domenico or Gallioppo (Frojo , 1878; Frojo 1883). Domenico Frojo and Vincenzo Licci (1881) describe the Pier Domenico of Martina Franca (TA), whose characteristics correspond well to the vine in question here. Giuseppe Frojo (1875) and Frojo and Licci (1881) outline the salient characteristics of the vine called Sò Nicola in Faggiano and San Giorgio Ionico (TA) and whose morphology seems to correspond to Notar Domenico. The synonym San Nicola, with which it has recently been identified, is reported by Fonseca (1892a) in Gallipolino (LE).

Art. 2 - Description and characteristics

Present in the province of Brindisi since ancient times, with always rather modest surfaces, the Notardomenico vine has generally been cultivated and vinified in blends with Ottavianello , another native vine of the Brindisi area with which it enters for the production of the Ostuni DOC wine. The vine is mainly widespread in old mixed vineyards of the Valle d'Itria, of the Murgia of Bari, in Salento often mixed with other white, red and black varieties.

Plant: semi-erect habit; tendrils distributed on the branch in a discontinuous manner;

Adult leaf: large size; pentagonal orbicular flap; presence of five weakly depressed lobes; absence of anthocyanin pigmentation of the main veins; flat or slightly wavy profile; very light blistering of the upper page of the flap; convex teeth; absence of teeth on the edge of the petiole sinus ; absence of creeping hairs between the main veins (underside); low density of erect hairs between the main veins (underside);

Flowering bud: open end; absence of anthocyanin pigmentation of the creeping hairs of the extremity; light-medium density of the creeping hairs of the extremities; dorsal side of internodes lightly streaked green; young leaf of a slightly pinkish green color with low density of creeping hairs between the veins of the lower page;

Inflorescence: hermaphroditic flower; presence of one-two inflorescences per shoot; average fertility of the basal buds of the shoot;

Bunch at maturity: high length; loose bunch; peduncle of medium length; cylindrical shape;

Grape when ripe: large size; spheroidal shape; purplish-black epidermis; thin skin; uncolored pulp; high firmness of the pulp; presence of seeds;

Productive characteristics: very high vigor of the branch; medium internode length; high weight of the berry; high production of grapes per m2; average sugar content of the must; average total acidity of the must; low pH of the wort;

Notardomenico is characterized by budding in the middle age; the other phases of flowering, veraison and maturation take place in the middle period. High fertility, both basal and distal, and productivity.

Resistances (macroscopic aspects)

- To adverse climatic conditions - 3) good

- To parasitic agents - 3) good

Behavior in vegetative multiplication

- Grafting affinity with the most common rootstocks - 3) good

Technological characteristics: it lends itself very well to obtaining a prestigious rosé wine, already produced in ancient times in the areas where it was grown. The wine vinified in red has a ruby red colour, not very intense, but brilliant, characterized by a good aromatic complexity with a prevalence of notes of ripe fruit, especially red fruits. The overall balance is discreet, while the structure is weak, so the wine is not suitable for ageing.

Art. 3 - Production area

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Art. 4 – Finding of plant material

Research, Experimentation and Training Center in Agriculture Basile Caramia, Via Cisternino, 281 - 70010 Locorotondo (BA).

Art. 5 – Rules for viticulture and winemaking

The environmental and cultivation conditions of the vineyards destined for the production of wine must be the traditional ones of the area. The maximum production of grapes per hectare of vineyard, in specialized cultivation within the company, must not be higher respectively for the wines with typical geographical indication "Puglia" white, red and rosé, at 26 tons;

As regards the yield per hectare in mixed cultivation, this must be related to that of specialized cultivation taking into account the effective number of vines.

The grapes destined for the production of wines must ensure that the wines have a minimum natural alcoholic strength by volume:

9.5% vol for whites;

9.5% vol for rosés;

10.00% vol for reds.

The grapes destined for the production of the sparkling and sparkling types can, by way of derogation, ensure a minimum natural alcoholic strength by volume of less than 0.5% vol. The grapes destined for the production of "wine of overripe grapes" must ensure a minimum natural alcoholic strength by volume of 15.00% vol. In the case of particularly unfavorable years, these values can be reduced by 0.5% vol.

In vinification, only those practices which give the wines their own particular characteristics are allowed. The maximum yield of grapes in finished wine, ready for consumption, must not exceed 80%, for all types of wine, with the exception of passito and/or overripe grapes for which it must not exceed 50% . Withering on the plant is also permitted.

3.15 Production regulations of the “Vite Santa Teresa”

Art. 1 – Name and historical notes

Santa Teresa Vine: The vine was recovered with this name in San Michele Salentino in the province of Brindisi, where its presence is very sporadic. By comparison with the genetic profiles it was found to be identical to a now rare cultivar called Frmentum in Croatia (Schneider et al., 2014), probably corresponding to a white berried Fermentun mentioned in the last century by Bulić on the island of Korčula in Dalmatia (1949). Staffa (1881) reports a black grape variety, called Uva della Signora Teresa, with "black, and right grains: it is the best for the production of excellent wines". More recently, Vitagliano (1985) mentions the white Santa Teresa grape among the varieties that at the end of the 19th century "accompanied Primitivo" in the Tarantino vineyards (p. 241).

Art. 2 - Description and characteristics

Santa Teresa is a denomination found in the province of Taranto and in particular in the Valle d'Itria where the vine has long been known and in the past cultivated in the old multi-variety vineyards raised in different forms (alberello, counter-espalier), very often associated with the DOC vines Martina Franca and Locorotondo. The denomination is probably due to the ripening period of the grapes, quite late, which takes place around the beginning of October, around the feast of Santa Teresa.

Plant: upright habit; tendrils distributed on the branch in a discontinuous manner;

Adult leaf: small size; wedge-shaped flap; presence of five weakly depressed lobes; absence of anthocyanin pigmentation of the main veins; revolute profile; absence of bullousness on the upper side of the flap; medium long straight teeth; absence of petiole sinus ; absence of teeth on the edge of the petiole sinus ; absence of creeping hairs between the main veins (underside); absence of erect hairs between the main veins (underside);

Flowering bud: open end; medium anthocyanin pigmentation of trailing hairs of extremities; low density of creeping extremity hairs; dorsal side of internodes green with red streaks; pinkish-green young leaf with low density of creeping hairs between the veins of the lower page;

Inflorescence: hermaphroditic flower; high number of inflorescences per shoot; high fertility of the basal buds of the shoot;

Bunch when ripe: long and compact bunch with a cylindrical shape;

Grape when ripe: small size; spheroidal shape; green-yellow epidermis; thick skin; uncolored pulp; slightly firm pulp; presence of seeds;

Productive characteristics: high vigor of the branch; medium internode length; high bunch weight; medium heavy berry; high production of grapes per m2; low sugar content of the must; average total acidity of the must; average pH value of the must; late budding; the other phases of flowering, veraison and maturation take place in a late period. Good fertility, both basal and distal, and productivity. Harvest: late (first ten days of October).

The wine has a straw yellow color of good intensity. Good aromatic complexity mainly due to aromas of fermentation origin. With a fairly contained alcohol content, it reveals a good total acidity content, which makes the overall balance discreet and with good intensity and persistence on the palate. On the palate, despite a rather poor structure, it is equally appreciated above all for the right balance between the acid flavor and a discreet fullness of body.

Art. 3 - Production area

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Art. 4 – Finding of plant material

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As regards the yield per hectare in mixed cultivation, this must be related to that of specialized cultivation taking into account the effective number of vines.

The grapes destined for the production of wines must ensure that the wines have a minimum natural alcoholic strength by volume:

9.5% vol for whites;
9.5% vol for rosés;
10.00% vol for reds.
The grapes destined for the production of the sparkling and sparkling types can, by way of derogation, ensure a minimum natural alcoholic strength by volume of less than 0.5% vol. The grapes destined for the production of "wine of overripe grapes" must ensure a minimum natural alcoholic strength by volume of 15.00% vol. In the case of particularly unfavorable years, these values can be reduced by 0.5% vol.

In vinification, only those practices which give the wines their own particular characteristics are allowed. The maximum yield of grapes in finished wine, ready for consumption, must not exceed 80%, for all types of wine, with the exception of passito and/or overripe grapes for which it must not exceed 50%. Withering on the plant is also permitted.