DELIBERA N. 19/P **DEL** 03 OTT 2022

REGIONE SICILIANA

ISTITUTO REGIONALE DEL VINO E DELL'OLIO

Il Presidente

VISTA la L.R. n. 64 del 18 luglio 1950 - Istituzione in Sicilia dell'Istituto Regionale della Vite e del Vino - e successive modifiche ed integrazioni;

VISTO l'art. 35 della L.R. n. 2 dell'8 febbraio 2007 relativo al riconoscimento di questo Istituto quale Ente di ricerca della Regione Siciliana;

VISTA la L.R. n. 25 del 24 novembre 2011 che estende al settore olivicolo-oleario le competenze dell'Istituto;

VISTE le delibere del Consiglio di Amministrazione dell'Ente n. 107 del 1 ottobre 2009 e n. 3 del 22 gennaio 2010 con le quali è stato approvato il Regolamento di Organizzazione;

VISTO il Regolamento interno di contabilità, adottato ai sensi della L.R. n. 3 del 13 gennaio 2015 con delibera commissariale n. 3 dell'11 settembre 2019 ed approvato dalla Giunta di Governo con delibera n. 54 del 13 febbraio 2020, con il quale si recepiscono le disposizioni del D. Lgs. n. 118/2011 e s.m.i.;

VISTO il D.P.R.S. n. 464 /Serv. I/S.G. del 6 agosto 2020, notificato all'IRVO a mezzo pec il 10 agosto 2020, con il quale è stato nominato il Consiglio di Amministrazione dell'Istituto per la durata di anni cinque;

VISTA la delibera consiliare n. 21 del 28/12/2021 con cui è stato approvato il bilancio triennale di previsione dell'IRVO relativo agli esercizi finanziari 2022/2024;

VISTA la delibera presidenziale n. 8 del 2/5/2022 con cui è stata approvata la variazione del bilancio di previsione dell'IRVO relativo all'esercizio finanziario 2022;

VISTA la delibera presidenziale n. 2 del 16 marzo 2021 con la quale il Dr. Gaetano Aprile, Dirigente del RUD della Regione Siciliana, è stato nominato Direttore Generale dell'IRVO;

CONSIDERATO che il medesimo ha assunto le predette funzioni il 22 marzo 2021;

VISTA la delibera presidenziale n. 3 del 25 marzo 2021 con la quale è stato approvato il contratto individuale di lavoro del predetto Direttore Generale;

VISTA la delibera consiliare n. 7 del 16 aprile 2021 relativa alla ratifica, da parte del C.d.A., delle predette delibere presidenziali n. 2 e n. 3 del 2021;

CONSIDERATO che lo Statuto-Regolamento dell'Ente, approvato con D. Ass. 21 dicembre 1951, n. 12, prevede tra gli scopi istituzionali dell'Ente:

- compiere studi sperimentali sui problemi di fisiologia viticola, in relazione all'ambiente;

-compiere studi enologici allo scopo di perfezionare la tecnica della vinificazione con particolare riguardo allo studio di microbiologia;

- collaborare con gli organismi che in Sicilia espletano attività nel campo vitivinicolo;

VISTO il bando AGER, terza edizione, "Dal suolo al campo – Approcci multidisciplinari per migliorare l'adattamento delle colture al cambiamento climatico", pubblicato sul sito internet della Fondazione in Rete per la Ricerca Agroalimentare e avente scadenza 05/10/2022;

VISTA la proposta di progetto dal titolo "*Sustainable management of vineyards in semi-arid areas: exploiting plant and bacterial diversity to optimize soil cover and nitrogen dynamics*", da realizzarsi, nell'arco di un triennio, in partenariato con l'Istituto di Bioscienze e BioRisorse del CNR, in qualità di Capofila, con il Dipartimento di Scienze e Tecnologie Biologiche Chimiche e Farmaceutiche dell'Università di Palermo, e con le Cantine Colomba Bianca Società Cooperativa Agricola, allegata alla presente deliberazione;

CONSIDERATO che le spese a carico dell'IRVO per la realizzazione del suddetto progetto sono quantizzabili in € 132.300,00, come da quadro economico allegato alla presente deliberazione, e che il suddetto Bando Ager prevede il loro rimborso, in caso di approvazione e finanziamento del progetto, in ragione del 100%;

RITENUTO utile realizzare le attività di ricerca del suddetto progetto, che prevede lo studio di nuove combinazioni di piante da inerbimento e di microrganismi del suolo al fine di aumentare in modo naturale il contenuto di azoto della vigna e conseguentemente dei mosti, con effetti positivi sulle fermentazioni vinarie e sulla qualità dei vini prodotti;

CONSIDERATA l'urgenza di procedere all'approvazione del progetto "*Sustainable management of vineyards in semi-arid areas: exploiting plant and bacterial diversity to optimize soil cover and nitrogen dynamics*" ed all'adesione al suddetto partenariato, visto l'imminente scadenza dei termini di presentazione della relativa richiesta di finanziamento alla Fondazione in Rete per la Ricerca Agroalimentare;

ACQUISITO il parere favorevole ed il visto di legittimità del Direttore Generale dell'Ente;

VISTO l'art. 5, comma 4 del vigente Statuto Regolamento dell'Ente;

DELIBERA

per le motivazioni esposte in premessa di:

APPROVARE la proposta di progetto dal titolo "*Sustainable management of vineyards in semi-arid areas: exploiting plant and bacterial diversity to optimize soil cover and nitrogen dynamics*", da realizzarsi, nell'arco di un triennio, in partenariato con l'Istituto di Bioscienze e BioRisorse del CNR, in qualità di Capofila, con il Dipartimento di Scienze e Tecnologie Biologiche Chimiche e Farmaceutiche dell'Università di Palermo, e con le Cantine Colomba Bianca Società Cooperativa Agricola, allegata alla presente deliberazione di cui fa parte integrante;

SOTTOSCRIVERE l'allegata lettera di adesione al partenariato, ai fini della presentazione della domanda di finanziamento del suddetto progetto nell'ambito del bando AGER, terza edizione, "Dal suolo al campo – Approcci multidisciplinari per migliorare l'adattamento delle colture al cambiamento climatico", pubblicato sul sito internet della Fondazione in Rete per la Ricerca Agroalimentare e avente scadenza 05/10/2022.

DELEGARE il Direttore Generale pro tempore dell'Ente all'assunzione dei necessari successivi provvedimenti.

Con provvedimento successivo all'eventuale approvazione del relativo finanziamento, si procederà ad assumere l'impegno di spesa necessario ai fini della relativa copertura delle anticipazione dei costi.

La presente deliberazione, che è immediatamente esecutiva, sarà trasmessa al Collegio dei Revisori e all'Organo di Vigilanza, pubblicata sul sito istituzionale ai sensi delle vigenti disposizioni in merito alla pubblicità ed alla trasparenza delle P.A. e sarà sottoposta a ratifica da parte del Consiglio di Amministrazione dell'Ente.

IL PRESIDENTE
Dr. Sebastiano Di Bella

PARERE FAVOREVOLE
Visto di legittimità ex art. 20 L.R. 19/05
Il Direttore Generale
Dr. Gaetano Aprile

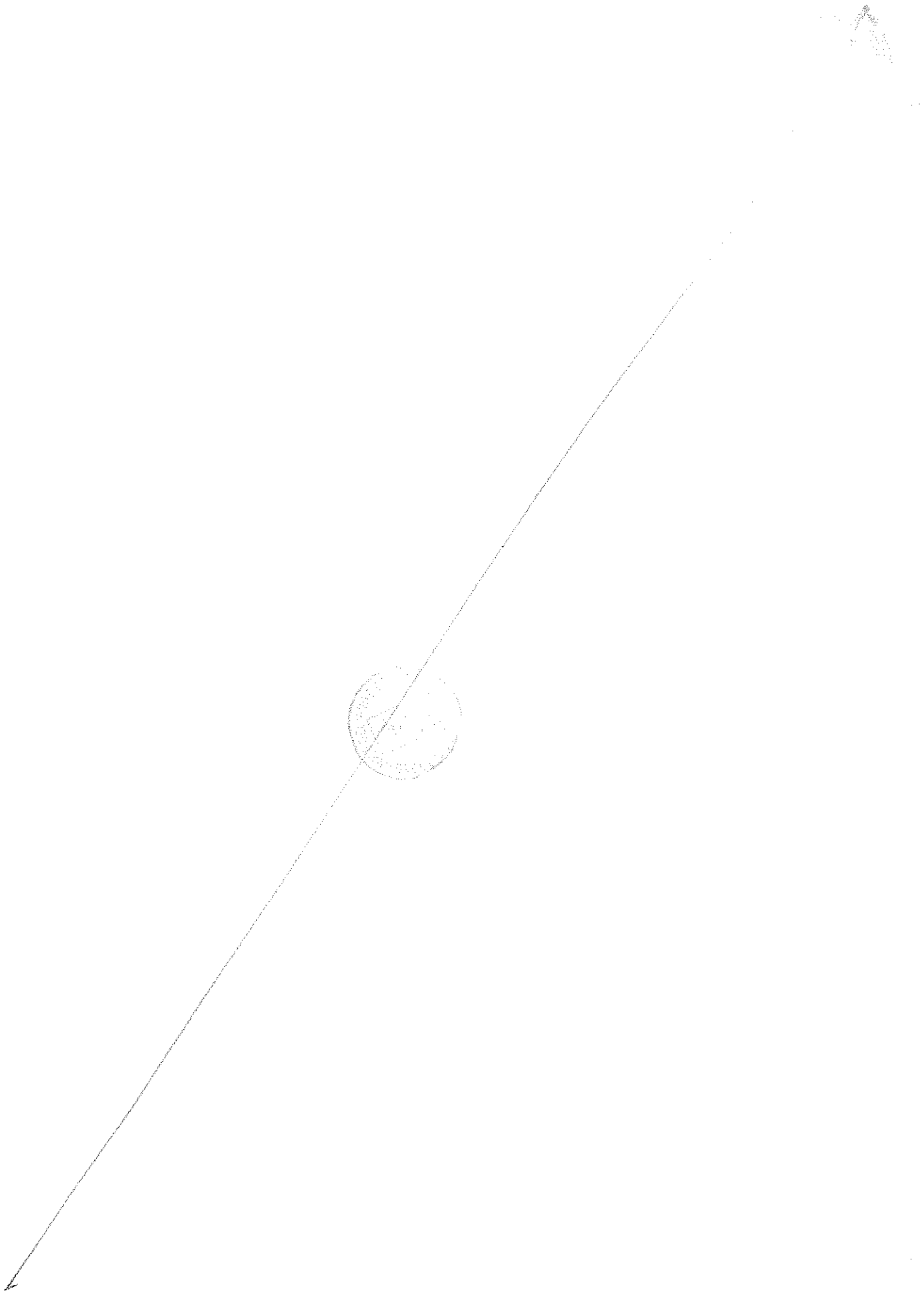
Per le competenze tecnico-scientifiche

Il Capo Area Tecnico-Scientifica
Dr. Lucio G. Monte

Il Dirigente U.O. Ricerca, Sperimentazione,
Trasferimento Innovazione e Sostenibilità
Dr. Antonio Sparacio

Il Dirigente U.O. Microbiologia applicata e
Biotecnologie
Dr. Daniele Oliva

VISTO
La Dirigente U.O. Contabilità e Bilancio
Dr.ssa Emilia Mulé



Ager call for proposal – From soil to field
Project form

Project Title

Sustainable management of vineyards in semi-arid areas: exploiting plant and bacterial diversity to optimize soil cover and nitrogen dynamics (Micro4grape)

Keywords: sustainable soil management, N transfer, cover crop plants, Fabaceae, vegetation surveys

Principal Investigator (name, surname, organization and position)

Davide Pacifico, Institute of Biosciences and BioResources, Palermo

Project duration

3 years

Partnership

INSTITUTION NAME	ORG. SHORT NAME	SCIENTIFIC REFERENT
1. Institute of Biosciences and BioResources, CNR	IBBR-CNR	Davide Pacifico
2. University of Palermo - Department of Biological, Chemical and Pharmaceutical Sciences and Technologies	UniPA - STEBICEF	Paola Quatrini
3. Istituto Regionale del Vino e dell'Olio	IRVO	Antonio Sparacio
4. Cantine Colomba Bianca Società Cooperativa Agricola	Colomba Bianca	Antonio Pulizzi

Background

Describe the background of the proposed project, critically evaluate the existing knowledge and identify the gap[s] the project intends to fill. Please specify how the proposed study could represent a significant advancement beyond the current state of art

In recent decades, the scientific community from around the world has given numerous alarms regarding the loss of organic matter and the decline of biodiversity in ecosystems. The intensification of agriculture and the increase in the use of synthetic products have increased the leaching of nitrates and soil erosion in cultivated land, with heavy consequences particularly in those areas exposed to climate change such as the Mediterranean Basin. The Mediterranean area, experiencing long-lasting seasonal drought and high summer temperatures, is particularly prone to the loss of organic matter, so that local agroecosystems are currently facing a lowering of soil quality combined with an increase in warm-loving weed pressure. European Community policies strongly support the use of low-impact methodologies, among which a central role is assigned to the organic regime. As the issue of soil will become increasingly important over the next few years, deepening the knowledge of alternative techniques is essential for all farmers who will face new environmental challenges and regulatory contexts in the near future.
The cover cropping approach with legume species confers a significant improvement in soil quality and weed-fighting benefits in the Mediterranean vineyards. Annual and perennial legumes synergistically benefit from infection with nitrogen-fixing bacteria. The use of legumes as a cover crop provides an increased amount of total nitrogen (organic + mineral) in the soil due to their role in fixing air nitrogen when legume roots are colonized by *Rhizobium* spp. (Peoples et al., 2009). This sustainable and nature-friendly approach, if adopted by Mediterranean grapevine growers, would

reduce the use of synthetic herbicides and mineral fertilizers, while ensuring a minimal impact on the environment compared to conventional practices. The use of cover crops has a positive effect by increasing soil organic carbon (SOC), improving water infiltration and aggregate stability, reducing erosion and greenhouse gases emissions to the atmosphere, and increasing biodiversity in both soil and vineyards. According to their origin, cover crops can be sown or spontaneous. When sown, the mixtures of species, particularly Fabaceae (legume) and Poaceae (grasses), are the most common. Moreover, cover crops can be classified as annual or permanent, according to their life cycle and cover crop duration.

The planting schemes commonly used in viticulture leave a large portion of the soil surface uncultivated. The management of this part has important effects on vegetative growth, yield, plant nutrition and water status, and grape and wine quality. Nitrogen is the most abundant soil-derived macronutrient present in the vine and it plays a leading role in many functions and biological processes of vines and of fermentation microorganisms. Nitrogen increase in grapes positively affects the yeast assimilable nitrogen (YAN) content in musts and the aromatic precursors in the wines. Yeast Assimilable Nitrogen (YAN) is a fundamental parameter to better manage the yeasts nutrition and to assure the correct performance in alcoholic fermentation.

The management of the vine nitrogen nutrition influences the compounds quality in the grape and, consequently, in the wine. Furthermore, the fermentation kinetics and the formation of sensorially active metabolites depend on the nitrogen availability of the must. The classic effect of nitrogen fertilization in the vineyard on the grape composition is an increase in the concentration of major nitrogen compounds, such as total nitrogen, total amino acids, arginine, proline and ammonium and consequently nitrogen assimilable by yeasts. Quantity and quality of YAN affect the quality of the wine. A deficiency of YAN in the must leads to a low yeast population, less fermentative vigor, greater risks of sluggish or stuck fermentations, greater production of unpleasant thiols (as hydrogen sulphide) and amyl alcohols and, on the contrary, low production of desiderable esters and long-chain fatty acids. Consequently, wines obtained by musts with optimal nitrogen levels present a better and more complex sensorial frame.

Micro4grape will investigate the use of innovative agronomic protocols for sustainable and resilient viticulture and the production of organic wines, by introducing several changes in different steps (processing, production, evaluation and marketing). The experimental design includes:

1) a profound rethinking of the 'ordinary' management of organic vineyards using as permanent cover crop a selected mixture of autochthonous annual herbs (legumes and/or small grasses), able to complete their life cycle in the autumn-spring seasons;

2) use of nitrogen-fixing bacteria isolated from spontaneous species and available at the University of Palermo to inoculate the selected autochthonous species.

The experimental activity involves monitoring and measuring the effect of agronomic interventions on the nitrogen content during the cultivation phases as well as during the wine production: the values of YAN (Yeast Assimilable Nitrogen) have in fact a direct effect on must fermentation processes. In addition, the success of the planned trials would have rapid and direct repercussions on the soil microbial biodiversity. The use of short-living annual legumes that overcome the dry season as seeds dispersed in the soil would reduce the management costs during summer, avoiding the water competition with the grapevine.

Preliminary data and project rationale

List and comment all preliminary data available and pertinent to the proposed research. Clearly state the project's hypotheses

(maximum 7000 characters excluding figures, tables and pictures)

Notwithstanding the vast botanical literature focused on the vascular flora and vegetation of Sicilian vineyards, and despite the very high number of species of spontaneous native legumes typical of Sicilian annual swords, pasturelands and fallows, there are very few scientific publications dealing with the selection of mixtures of native seeds, suitable to be used as cover crops for agricultural purposes. Hence, the present project will provide local farmers with useful information on the best practices to be carried out to create a sustainable and long-lasting cover crop assemblage by using local native vascular plants (mostly annual legumes and grasses)

Soil microorganisms offer a very promising approach for soil restoration and improvement of plant tolerance to abiotic and biotic stresses. Symbiotic bacteria promote plant growth and alleviate stresses by providing minerals (such as nitrogen, phosphate, and potassium) and hormones (including auxin, cytokinin, and abscisic acid) or by reducing ethylene production.

Plant growth-promoting rhizosphere (PGPR) bacteria are a promising tool to restore agricultural lands and improve plant growth in arid soils. Microrganisms are often adapted to extreme habitats and may have developed strategies to activate stress tolerance responses even in their host plants where they reside. In recent years, an increasing number

of studies have highlight the role of (PGPR) bacteria in increasing abiotic stress tolerance PGPR nitrogen-fixing bacteria can be isolated from authouctonous species from natural environments and then transferred to cultivated fields.

Objective of the project and relevance to the Call

Please provide information about project's aims. Clearly specify how the project fits with the Ager's goals, as they are stated in the Call

(maximum8000characters)

Micro4grape aims to provide innovative solutions for the sustainable management of the vineyard through the cultivation between the rows of autochthonous species (legumes) able to form stable symbiosis with selected consortia of nitrogen fixing bacteria. In particular, the project intends to develop a reference model for the vineyard agro-ecosystem that can be adapted to the different wine-growing regions of the Mediterranean facing the ongoing climate change, aimed above all at reducing interventions and energy inputs. Thanks to a variety of soils and climatic conditions and to its long grapevine-growing tradition, represented by a kaleidoscope of native cultivars and wines now known all over the world, Sicily offers an ideal backstage for experimentation. Moreover, this project intends to strengthen the relationship between cultivated and natural spaces, hosting inside the vineyard autochthonous organisms (plants + microorganisms) whose selection will take into account local floristic and vegetation patterns, favouring the use of the annual plants already present in the territory and consequently better adapted to local soil and climatic conditions. Through an innovative management that exploits the self-generating capacity of natural environments, plant and soil microbial resources no longer become just something to protect, but a valuable contribution to improve the quality of productions.

To maximize these objectives, all experimental trials will be carried out in sites close to Sites of Community Importance of the Sicilian Natura 2000 network, characterized by a high level of naturalness and biodiversity. Four research facilities with researchers and technicians working in the fields of agronomy, microbiology, oenology, biotechnology, physiology, molecular biology, bioinformatics, will share an integrated multidisciplinary approach to:

i) select microbial consortia composed of cultivable nitrogen-fixing bacteria transferable to plant propagating material;

ii) evaluate the ability of the selected consortia to colonize the roots of autochthonous legume species;

iii) reveal the synergies existing between microorganisms present in the consortium and the nitrogen dynamics both in the soil and in the final products.

Moreover, Micro4grape aims to expand the scientific network between the partners and the scientific community, through regular updates on the progress of the activities, meetings and direct exchanges between the personnel involved, with particular regard to training opportunities for women and young researchers.

The following operational objectives will be addressed through six Work Packages (WPs):

OB1: Field surveys and selection of legume species

OB1 aims to identify the most suitable species hosts for nitrogen-fixing microorganisms available at UniPA collection among the annual legumes growing in local plant communitis,. OB1 also aims to create a seed reservoir from the natural environments to be used for the controlled cover cropping of the selected vineyards

Activities aiming at OB1 are included in WP1.

OB2: Identification of nitrogen fixing symbiotic bacteria from autochthonous species (legumes)

The collection already available at UniPA will be enriched by isolation of local strains of N-fixing bacteria from the selected natural sites. New isolation and characterization of microrganisms will be carried out from legume species suitable to be used as cover crops for agricultural purposes. All activities aiming at OB2 are included in WP2, their completion will ensure the selection of microbial consortia for the subsequent project phases.

Bacterial strains to be inoculated will be chosen for each vineyard following the comparison of the literature and preliminary data available from UniPA. OB2 achievement underlies the integration of traditional microbiology techniques with molecular barcording methods for unambiguous identification of the selected bacteria. The cultivable bacteria strains isolated from local species will be screened for their N-fixing activity in order to identify the most promising consortia.

OB3: Identification of the best cover cropping mix

OB3 aims to identify the best legume-microrganisms combinations showing the highest yield and quality of final products in field conditions. Given the amount of data generated, and the presence of multiple environmental variants, OB3 will be further divided into three sub-objectives.

i) Identification of the best agronomical practices for a stable colonization of spontaneous legumes in the vineyard;

The first sub-objective to be achieved is to evaluate the ability of spontaneous leguminous plants to adapt to the cultivation conditions in the vineyard system, and consequently to manage and organize any field operations to favour their stable settlement in the inter-row.

ii) Evaluation of the grape productivity and product quality in the field (yield and YAN content of berries).

The measurement of the nitrogen content in the berries will allow a first level of screening to choose among all the plant-microorganism combinations tested in the single plots the most promising that will later have a direct effect on the improvement of natural wines.

iii) Evaluation of quality in the cellar: evaluation of yeast fermentative performance and oenological parameters.

The final goal of the project is the qualitative improvement of wines which will be verified starting from the fermentation process up to bottling.

Activities aiming at OB2 are included in WP4 and WP5.

OB4: Communication and dissemination of results

The achievement of OB4 will ensure that the technological innovations proposed and the results obtained will reach both the scientific community and the agri-food chains. IBBR will coordinate the public dissemination of the project results among the specialized public (scientific community, potential stakeholders, policy makers / authorities), and at the exchange of experiences with other working groups active in the microbiological and agronomic fields. All activities aiming at OB4 are included in WP6 and are outlined in detail in the Micro4grape Communication plan. This document will constitute the point of reference for all communication and dissemination activities, in order to achieve the following objectives:

1. create a link with stakeholders since the project beginning, making easier the use of project results
2. reduce the gap between the world of research and citizens-consumers, enhancing the work of researchers and research institutions involved;
3. bring the results of the project to the attention of public and private bodies and institutions to open new funding channels to expand or follow up on research;
4. catalyze the interest of potential partners for future projects;
5. foster contact with potential financiers interested in further development of the achieved results.

OB5: Strengthening networking, cooperation and equal opportunities between research partners (All RUs)

Micro4grape aims to create new scientific networks since its early phases, thanks to the multidisciplinary approach, skills and experience of the four groups involved. In particular, the project aims to become a training opportunity for young researchers working in the agri-food research, for the sustainable management of primary resources and bio-resources. As specific objectives, the project will ensure visibility to young researchers through the development of exchange networks and the transfer of knowledge. At the same time, Micro4grape will ensure the involvement of women in all phases of the daily work, including the project management, the access to laboratory and analysis tools, up to the data processing and result presentation.

Experimental plan

Describe: i) methods and actions planned, ii) expected outputs, iii) milestones and deliverables, iv) role of the partner[s].

Please consider potential pitfalls and caveats, discuss difficulties and limitations of the proposed procedures and suggest alternative approaches to achieve expected objective.

Provide a timetable (Gantt)

(maximum 25000 characters excluding figures, tables and pictures)

The experimental plots will fall within organic vineyards implanted on soils originating from different bedrocks, namely gypsums in the municipality of Calatafimi (Contrada Pianto Romano, site of historical and cultural interest) and sandy limestones in that of Mazara del Vallo (next to the Natura 2000 site ITA010005 "Lago Preola e Gorghi Tondi"). The dynamics of local vegetation (floristic composition, plant cover, establishment of the sown species, etc.) and soil nitrogen content will be monitored in 3,000 m2-wide plots in the vineyards selected in both areas.

WP1: Selection of host plant species

1) Field botanical surveys in the target sites to identify the annual legumes growing in local plant communities, particularly focusing on the relative abundance of the most suitable species hosts for nitrogen-fixing microorganisms available at UniPA collection
2) Seed collection from the selected annual legumes;herb species selection will take into account local floristic and vegetation patterns, favouring the use of the annual plants already present in the territory and consequently better adapted to local soil and climatic conditions.

All field activities aiming at OB1 are included in WP1 and will be coordinated by IBBR.

WP2: Selection of microorganism consortia:

1) A collection of nitrogen-fixing bacteria isolated from spontaneous legume species collected in Sicily already available at UniPA
2) New isolation, identification and characterization of culturable nitrogen-fixing bacteria isolated from spontaneous legumes present in both selected sites
3) Inoculation tests of selected nitrogen-fixing bacteria on different native legume species
4) Preliminary screening of nitrogen fixation activity of isolated culturable bacteria strains;
5) Selection of micro-organisms with high colonization and nitrogen fixation rates in native legume species

WP3: management of experimental fields and evaluation of nitrogen dynamics in the soil

1) sowing of native legume species inoculated with selected nitrogen-fixing strains
2) evaluation of the agronomic performance of the different legume mixtures
3) monitoring ongoing vegetation dynamics to evaluate the success of the sowing experiments through several proxies/indicators (e.g., overall floristic composition, total plant cover, rate of establishment – i.e. identity and cover rate - of the sown species, etc.)

WP4: evaluation of nitrogen dynamic in the berry and quality assessment of final products

1) evaluation of the YAN content in the berries
2) evaluation of yeast fermentative performance
3) oenological analysis

After the first year of cover cropping, the grapes obtained from the different experimental models will be analyzed at the enochemical and microbiological laboratories of the IRVO, in order to evaluate the variations obtained on the yeast assimilable nitrogen (YAN) content and on the blastomycetic flora naturally present on the grapes surface. Depending on the best results, the following year the grapes from the best models, together with those of the related controls, will be transferred to the IRVO experimental winery. The grapes will be analyzed in the must main components and YAN, then a standard vinification protocol will be applied, in duplicate, to verify the results of the experiments carried out in the field. During alcoholic fermentation, the yeasts growth will be monitored and the obtained wines will be analyzed in the main analytical parameters, as well as the sensory characteristics and volatile components in order to verify their differences.

WP5: Analysis, verification and integration of data

WP6: Project management, result communication and dissemination

1. Scientific project management (CNR-IBBR).
2. Results communication (CNR-IBBR, Innovation Broker). A communication plan will be prepared in order to organize some events for each target of civil society, like press releases and newsletter
3. Results dissemination (CNR-IBBR, Innovation Broker).
   3.1 Project organization forecasts meetings on line every two months
   3.2 kick off meeting
   3.3 one meeting/year and one workshop (during Viniyaly exhibition) dedicated to stakeholders, policy makers, University, extension service
   3.4 short scientific&popularizing contributions about Project aims on Web site www.progettoager.it
   3.5 one field day (open day)/year for stakeholders, extension service and farmers
   3.6 one wine-tasting/year and one wine tasting during Vinitaly exibition
   3.7 scientific publications on domestic revues
   3.8 agricultural good practices manual about project aims

Project originality and innovation

Describe the originality of your research and how it represents an advancement beyond the state of art.
Indicate if the project employs novel concepts, approaches or methods.

(maximum 5000 characters)

This project will deliver innovative agronomic protocols for sustainable and resilient viticulture and the production of organic wines, by introducing several changes in different steps (topsoil and soil management, processing, production, evaluation and marketing).

Measuring the improvement in the soil levels of organic and nitrogenous substances will allow to improve the quality of the produced wines

Impact

Describe how your proposal would impact on the crop/ group of crops identified in the project.
Describe the prospects for transferability of the research results and the impact that the innovation and the technology transfer could generate on economic growth.

(maximum 8000 characters)

Experimentation, through the use of seed mixtures of native annual species and of nitrogen-fixing bacteria inoculations, will drastically reduce or cancel the necessity of mineral nitrogen inputs; as a consequence of the burial of the herbaceous vegetation, after it has carried out their annual life cycle, there should be an improvement in the organic substance content in the soil and, indirectly, a change in the physical properties of the soil as the cation exchange capacity, increasing the ability to retain mineral elements and water, as well as on the microbiological component. Moreover, the presence of the turf during the autumn-spring period will preserve the soil from erosive phenomena, resulting from the rains that, in the island, are concentrated almost exclusively during the winter, as well as slow down the in progress desertification phenomenon. Finally, the presence of nitrogen in the soil favors optimal growth of vine plants; a good vigor of the plants allows to have a leaf apparatus in perfect efficiency and able to protect the bunches from direct solar radiation that causes burning phenomena of the berries, a good ratio between effective leaf area and grapes weight that favors an optimal balance between the sugar and the acidic components of the grapes and an increase in the plant productivity. By application of innovating agronomic methods addressed to sustainable and resilient viticulture and production of natural wines, the Project Micro4grape means reach process, product, evaluation and market changes:

- process change includes both agronomical and enological aspects, due to innovating models of soil management for organic and resilient viticulture and innovating vinification methods too.
- product change will be obtained by production of natural wines
- evaluation chain criteria change will happen by new methods that include qualitative and quantitative production aspects, impact on ecosystem services by the point of view of biodiversity, increase of soil organic carbon, carbon dioxide consumption, water resource protection
- market changes include new production chains addressed to the request of new consumers more careful to the ecosystem aspects and wine healthness, like young people, millenians, women, upper class population, curious consumer: this phenomenon, really existing from some years in center-north Europe countries, USA and Far-East as well, is increasing in Italy and so the main E-commerces and ODG are paying attention to this one.

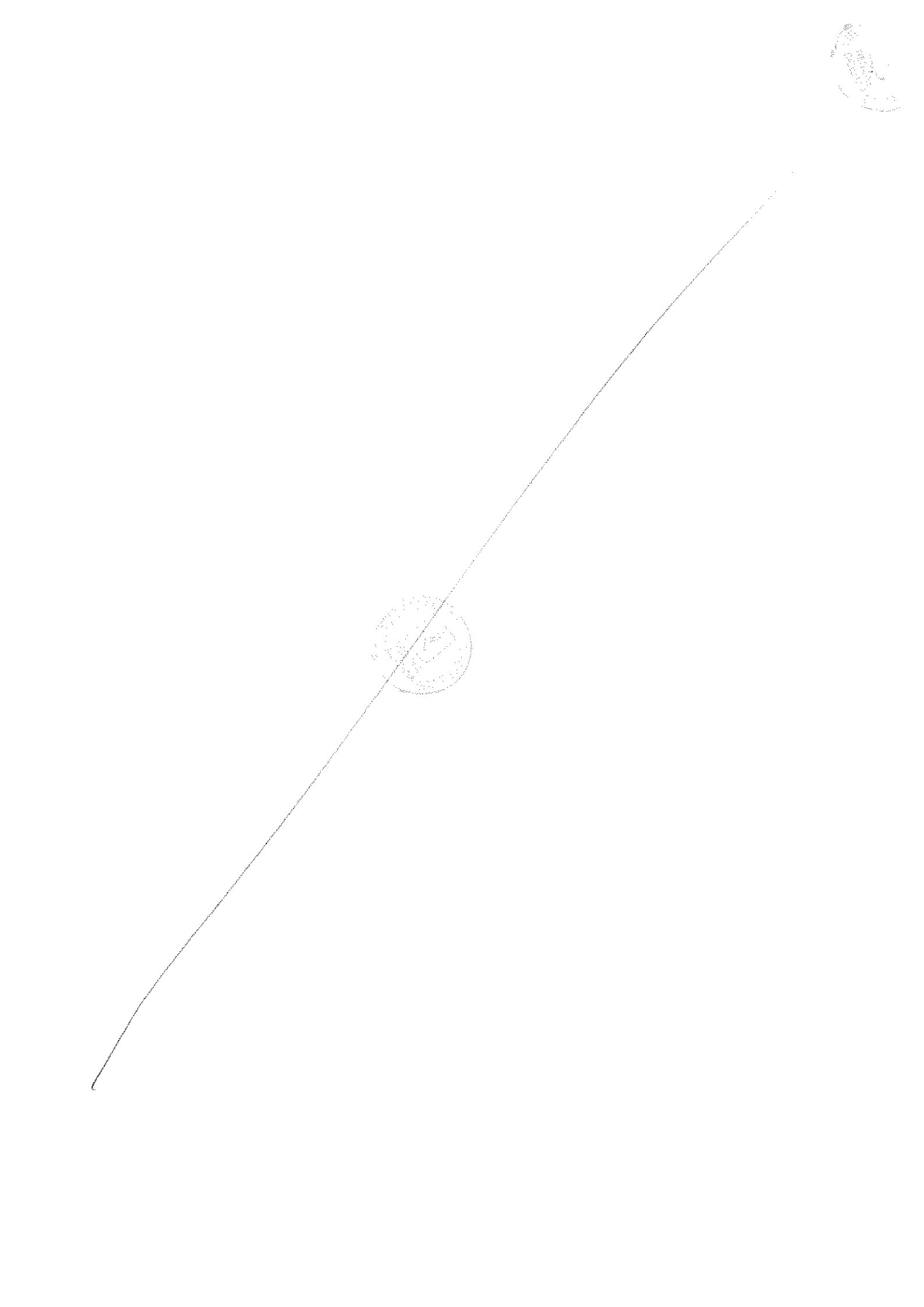
These changes mean this innovating production philosophy can reasonably generate new chains related to job and market opportunities, first of all in Sicily island specialized for organic wines

Bando AGER: DAL SUOLO AL CAMPO

QUADRO ECONOMICO PROGETTO

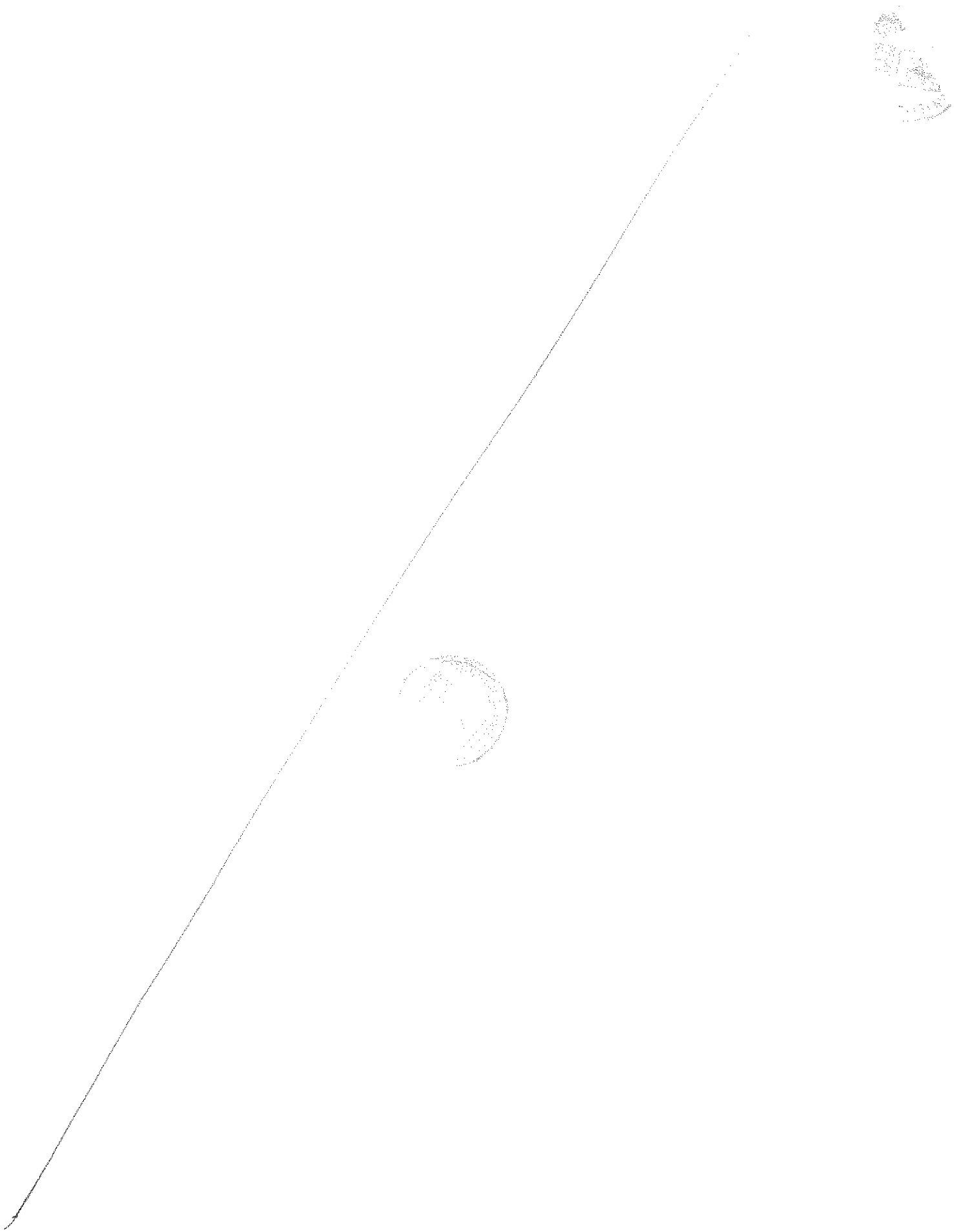
"Sustainable management of vineyards in semi-arid areas: exploiting plant and bacterial diversity to optimize soil cover and nitrogen dynamics"

Partner	Referente	Ruolo	Budget
CNR IBBR	Davide Pacifico	Capofila	€ 181.700,00
UniPA - STEBICEF	Paola Quatrini	Partner 1	€ 189.000,00
Cantine Colomba Bianca Società Cooperativa Agricola	Antonio Pulizzi	Partner 2	€ 150.000,00
IRVO	Antonio Sparacio	Partner 3	€ 132.300,00
totale			€ 653.000,00



QUADRO ECONOMICO PROGETTO
"Sustainable management of vineyards in semi-arid areas: exploiting plant and bacterial diversity to optimize soil cover and nitrogen dynamics"
PARTNER IRVO

	Tipologia di costo	IRVO
		Partner 3
A03	Costi ammortizzabili	€ 0,00
A04	Altre spese per investimenti Altre spese per investimenti ammortizzabili.	€ 0,00
A06	Personale non strutturato (Temporary staff)	€ 79.000,00
A07	Prestazioni professionali di terzi (Sub-contractors and consultants	€ 6.000,00
A08	Materiali di consumo (Consumables)	€ 41.000,00
A09	Spese correnti (Overheads)	€ 6.300,00
A10	Attività di comunicazione/disseminazione e altre spese gestionali (Communication and dissemination activities and other costs)	€ 0,00
	Totale	132.300,00 €



ISTITUTO REGIONALE DEL VINO E DELL'OLIO

Palermo, ...

Oggetto: Lettera di adesione al partenariato - Progetto Ager

Il sottoscritto SEBASTIANO DI BELLA, in qualità di Legale Rappresentante dell'ISTITUTO REGIONALE DEL VINO E DELL'OLIO conferma la volontà di partecipare, come [ ] capofila [X] partner (*barrare la voce d'interesse*), al progetto di ricerca dal titolo "*Sustainable management of vineyards in semi-arid areas: exploiting plant and bacterial diversity to optimize soil cover and nitrogen dynamics*" presentato ad Ager in risposta al bando "Dal suolo al campo - Approcci multidisciplinari per migliorare l'adattamento delle colture al cambiamento climatico", ANNO 2022.

Dichiara altresì di conoscere ed approvare tutti i contenuti del menzionato bando e s'impegna al compimento di tutte le attività previste dal piano del progetto a carico dell'ente rappresentato.

Prende atto, inoltre, che il progetto ha durata di 36 MESI e il costo complessivo è di 653.000,00 euro. Il preventivo dei costi eleggibili a carico del nostro ente conformemente alle prescrizioni del bando, è pari a 132.300,00 euro corrispondenti al contributo richiesto ad Ager.

Il progetto prevede la partecipazione degli enti di seguito elencati, che esprimono la propria volontà di partecipare al progetto mediante sottoscrizione della lettera di adesione al partenariato da parte del rispettivo Legale Rappresentante:

- CAPOFILA - Istituto di Bioscienze e BioRisorse del CNR, rappresentato dal Legale Rappresentante Dr. GIOVANNI GIUSEPPE VENDRAMIN - Responsabile Scientifico del Progetto Dr. DAVIDE PACIFICO.
- PARTNER - Università di Palermo, con il Dipartimento di Scienze e Tecnologie Biologiche Chimiche e Farmaceutiche, rappresentata dal Legale Rappresentante, il Magnifico Rettore, prof. MASSIMO MIDIRI - Referente Scientifico Prof.ssa PAOLA QUATRINI.
- PARTNER - Istituto Regionale del Vino e dell'Olio, rappresentato dal Legale Rappresentante, il Presidente Dr. SEBASTIANO DI BELLA - Referente Scientifico DR. ANTONIO SPARACIO.
- PARTNER - Cantine Colomba Bianca Società Cooperativa Agricola, rappresentato dal Legale Rappresentante, il Presidente Sig. LEONARDO TASCHETTA - Referente Scientifico DR. ANTONIO PULIZZI.

In caso di positiva valutazione del progetto e, quindi, di concessione del contributo, questo ente si impegna sin da ora a sottoscrivere un apposito accordo di partenariato con i soggetti promotori dell'iniziativa, come sopra individuati.
In fede,

IL PRESIDENTE
Dr. Sebastiano Di Bella