

# **BIOTECHNOLOGIES FOR AGRICULTURE**

**Eng. Fabrizia Pasquarelli**  
**R&D manager**

In relation to the AGENDA 2030 schedule for sustainable development signed in September 2015 by the governments of the 193 member countries of the UN, SPAA<sup>®</sup> is committed to contribute to the achievement of the following goals:



**Porre fine alla fame, raggiungere la sicurezza alimentare, migliorare la nutrizione e promuovere un'agricoltura sostenibile**



**Incentivare una crescita economica duratura, inclusiva e sostenibile, un'occupazione piena e produttiva ed un lavoro dignitoso per tutti**

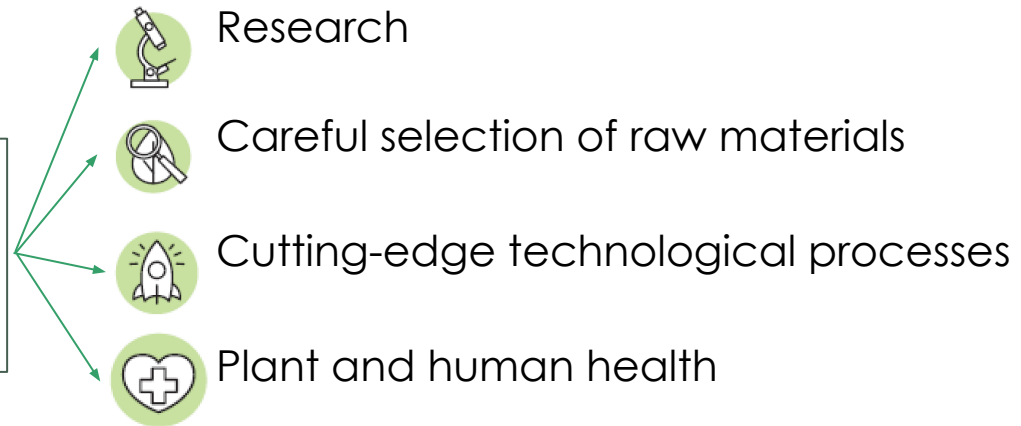


**Costruire un'infrastruttura resiliente e promuovere l'innovazione ed una industrializzazione equa, responsabile e sostenibile**



**Garantire modelli sostenibili di produzione e di consumo**

## SUSTAINABLE DEVELOPMENT



## RIMPAS<sup>®</sup>

RESEARCH AND EXPERIMENTATION METHOD

## • ENVIRONMENTAL SUSTAINABILITY

In 2019 SPAA<sup>®</sup> obtained the Integrated Environmental Authorisation (IEA), which includes the management of raw materials and hazardous substances, atmospheric emissions, waste, noise, the adoption of BAT and specifies the requirements to be adopted.

The certification of the Environmental Management System according to ISO 14001, obtained in 2020, proves the management's commitment to environmental protection, especially the prevention of pollution and the sustainable use of natural resources and energy throughout the product life cycle, from selection of raw materials to disposal by the end user.

Member of CISQ Federation



## • PRODUCT SUSTAINABILITY

Member of CISQ Federation



The Quality Management System has been ISO 9001 certified since 2014, in order to improve the performance of all company processes, so as to be ready to respond promptly and effectively to the implicit and explicit demands and needs of customers, with a view to continuous improvement.

# PROCESS BIOTECHNOLOGIES

The great potential of the natural world is transformed into natural technical solutions

**C.E.S.Hy.V.<sup>®</sup>**

**C**ontrolled  
**S**elective  
**E**nzymatyc  
**H**ydrolysis  
**V**egetal **P**roteins

- Selected enzymes with high specificity
- Carefully controlled and constantly monitored process parameters allow high reaction yields with low environmental impact and preserve the functionality and properties of the bioactive molecules present.

This production technology enables not only the protein molecules but also other biomolecules present in corn gluten with a biostimulating action to be solubilised and made readily available.

ITALYn patent licensed **No. 102019000000232**

# PROJECT: production of innovative protein hydrolysates - Corn gluten hydrolysate

- **University of Aquila**

- Department of Industrial Chemistry, Information and Economy  
Head of Scientific Committee Prof. Alberto Gallifuoco



- **University of Naples Federico II**

- Head of Scientific Committee Prof. Angela Amoresano  
Department of Chemical Sciences Mass Spectrometry Laboratory



## CORN GLUTEN HYDROLYSATE



**FREE AMINO ACIDS**



**PEPTIDES**  
(MW < 1000 Da)



**NATURAL PLANT GROWTH REGULATORS**



**VEGETAL STEROLS**



## CLAIM: Quality

- Root development
- Flowering - fruit setting
- Fruit quality: consistency, size, colouring

N	Description of activities	Supervisor	Start	End
1	<b>Study of market needs</b>	Technical department SPAA	jun-14	nov-14
2	<b>Technical feasibility study</b>	Technical department SPAA in collaboration with University of Aquila	sept-14	jan-15
3	<b>Design input elements Draft formulation MOD701.08 (§ 7.3.2 of MQ)</b>	Technical department SPAA in collaboration with University of Aquila	feb-15	oct-15
4	<b>Design review Compliance of formulation with requirements MOD701.09 (§ 7.3.4 of MQ)</b>	Technical department SPAA in collaboration with University of Aquila	oct-15	feb-16
5	<b>Design verification Pilot TESTING on an industrial scale Laboratory TESTING Compliance with legislative requirements MOD701.10 (§ 7.3.5 of MQ)</b>	Technical department SPAA in collaboration with University of Aquila	nov-15	apr-17
6	<b>Review of design changes Monitoring of formulation changes MOD701.12 (§ 7.3.7 of MQ)</b>	Technical department SPAA in collaboration with University of Aquila	jan-17	nov-17
7	<b>Design validation Experimental field trials MOD701.11 (§ 7.3.6 of MQ)</b>	Technical department SPAA	may-17	dec-18
8	<b>Market TESTING Market effectiveness trials</b>	Technical department SPAA in collaboration with University of Aquila	jan-19	dec-19
9	<b>Monitoring of formulation changes MOD701.12 (§ 7.3.7 of MQ)</b>	Technical department SPAA	jul-19	mar-20
10	<b>Market TESTING (Safe product - Application for inclusion as Biostimulant January 2018) for placing on the market in Italy and Europe</b>	Technical department SPAA	mar-20	dec-20
11	<b>Market TESTING (Inclusion of CMC 2020 -2021)</b>	Technical department SPAA	mar-20	dec-21
12	<b>Inclusion in 2022 - REACH</b>	Technical department SPAA	mar-20	dec-22

## REACH REGISTRATION



1 (1)

28 December 2021

### SPAA s.r.l.

Via delle Industrie, 11-13  
65013, Città Sant'Angelo  
Italy

Submission date: **20 December 2021**

Submission number: **UY879339-74**

Decision number: **SUB-D-2114582080-56-01/F**

EC number: **954-297-5**

Registration number: **01-2120901907-52-0000**

### DECISION ON YOUR REGISTRATION

Based on Article 20(2) of Regulation (EC) No 1907/2006 ('REACH'),

your registration for the substance with EC number **954-297-5** is **complete**. This registration entitles you to manufacture/import the substance, or produce or import an article containing it.

Your registration covers:

- the tonnage band **between 100 and 1000 tonnes/year**

The registration number is: **01-2120901907-52-0000**

The registration date is: **20 December 2021**

## EVALUATION OF EXPERIMENTAL ACTIVITIES

CROP	YEAR	TESTING CENTRE	DOSE	METHOD OF APPLICATION	PHENOLOGICAL PHASE
Lettuce var. Latina	2016	RES AGRARIA	4000 ml/ha	Fertigation	Transplanting or after 2 days
			6000 ml/ha	Fertigation	20-25 days after first application
Basil	2017	Agronova	200 ml/hl	Fertigation	1° (from the fourth true leaf)
			200 ml/hl	Fertigation	2° (10 days after the first treatment)
DURUM WHEAT Var. Claudio	2017	CESA	3000 ml/ha	Weeding+SURNAN	
Tomato var. Optima	2017	RES AGRARIA			
TURF	2017	RES AGRARIA	5000 ml/ha	SPRAY	Pre-emergency
			15000 ml/ha	SPRAY	Post-emergency
TABLE GRAPE (ITALY)	2017	CORAGRO	15-20 kg/ha	Fertigation	Flowering
			15-20 kg/ha	Fertigation	Fruit setting
WINE GRAPE (Var. Trebbiano)	2017	RES AGRARIA	1,5-4 kg/ha	Foliar	Emergency of inflorescences -Flowering
			4,5 kg/ha	Foliar	Flowering
			20 kg/ha	Fertigation	Fruit development
			4,5 kg/ha	Foliar	Fruit development
			20 kg/ha	Fertigation	Fruit development
			6 kg/ha	Foliar	Fruit development
			40 kg/ha	Fertigation	Fruit ripening
			6 kg/ha	Foliar	Fruit ripening
			40 kg/ha	Fertigation	Fruit ripening
			6 kg/ha	Foliar	Fruit ripening
Watermelon	2020	Agronova	10-15 L/ha	Fertigation	Growth
TABLE GRAPE (RED APIRENE)	2020-2021	AGRIOFFICE	35-50 L/ha	Fertigation	Beginning of veraison

## EVALUATION OF EXPERIMENTAL ACTIVITIES

CROP	YEAR	TESTING CENTRE	INDEXES
Lettuce var. Latina	2016	RES AGRARIA	Root development
			Vigour
			Green index
			Foliar growth
			Production yield
Basil	2017	AGRONOVA	Green index
			Foliar growth
			Turgescence
DURUM WHEAT var. Claudio	2017	CESA	Humidity
			Weight of 1000 seeds
			Hectolitre weight
			Proteins %
Tomato var. Optima	2017	RES AGRARIA	Plant height
			medium n° of flowers
			medium n° of leaves
			medium n° of fruits
TURF	2017	RES AGRARIA	Colour
			Quality
Watermelon	2020	AGRONOVA	Production yield
			Vigour

## EVALUATION OF EXPERIMENTAL ACTIVITIES

CROP	YEAR	TESTING CENTRE	INDEXES
TABLE GRAPE var. ITALY	2017	CORAGRO	Colour
			Quality
			°Brix
WINE GRAPE var. Trebbiano	2017	RES AGRARIA	Vigour
			Green index
			Production yield
			Bunch weight
			° Brix
PERO	2021	AGRI 2000 NET	Fruit weight
			Yield
			Fruit size
			Sugar content
			Consistency
			Preservation
CILIEGIO var. Bigarreau var. Ferrovia	2021	TECHNICAL OFFICE SPAA	Calibre ° Brix Average drupe weight
TABLE GRAPE var. Black Magic var. Vitroblack var. Midnight beauty var. Allison var. Timco var. Scarlotta var. Arra 32 var. Crimson var. Apulia	2020-2021	AGRIOFFICE	Consistency
			Size
			Colouring



**AGRONOMIC TRIALS**  
2020-2021  
in PROVINCES OF  
BARI and TARANTO  
**PHENOLOGICAL EVALUATIONS**

**TABLE GRAPE CV. BLACK MAGIC  
NARDO' AGRO  
APPLICATION FERTIGATION  
DOSE OF 35 LT X HA  
APPLICATION DATE: 18 MAY**

26/05



TABLE GRAPE CV. BLACK MAGIC  
NARDO' AGRO  
APPLICATION FERTIGATION  
DOSE OF 35 LT X HA  
APPLICATION DATE: 18 MAY

## RESULTS

Data of harvest	SPAA <sup>®</sup> COMPANY		THESES	
	Grape harvested with commercial maturity on 30 ares (ql)	% of total	Grape harvested with commercial maturity on 30 ares (ql)	% of total
10/06/2021	56	90	12	18,75
16/06/2021	6,17	10	41,20	64,35
21/06/2021	-	-	10,80	16,90
		100		100

**TABLE GRAPE CV. VITROBLACK  
GINOSA AGRO  
APPLICATION FERTIGATION  
DOSE OF 50 LT X HA**



TABLE GRAPE CV. VITROBLACK  
GINOSA AGRO  
APPLICATION FERTIGATION  
DOSE OF 50 LT X HA

RESULTS

	First harvest	Second harvest	Following	Waste
<b>SUMMARY A</b> COMPANY THESIS	40 ql	72 ql	61 ql	45 ql
<b>SUMMARY B</b> THESIS SPAA <sup>®</sup>	120 ql	85 ql	20 ql	12 ql
	<b>+ 200%</b>	<b>+ 18%</b>		

# Phenological evidences

- RAPID INCREASE OF COLOURING
  - UNIFORMITY OF COLOURING
    - INCREASE OF SIZE
- INCREASE OF BERRY FIRMNESS
- ABSENCE OF CRACKING PHENOMENA

# RESEARCH ACTIVITIES 2022 – 2023

## INDEX EVALUATION

- Anthocyanin concentration
- Bunch weight/Berry weight
- Whole berry consistency
- Refractometric dry residue (°Brix)
- Colorimetric analysis

## TRANSCRIPTOMIC ANALYSIS VITIS VINIFERA

Global study of the coding (mRNA) and non-coding (sncRNA) transcriptome to define gene expression in response to different biological conditions and in relation to particular developmental moments of the grapevine plant.



UNIVERSITÀ  
di VERONA

Dipartimento  
di BIOTECNOLOGIE



# Thank you for attention

*Search where you do not  
see  
to find what you do not*