VERBALE N.6
RIUNIONE DEL COLLEGIO DEI DOCENTI DEL DOTTORATO DI RICERCA IN "SCIENZE DELLE PRODUZIONI VEGETALI E ANIMALI"
19.06.2023

Il giorno 19.06.2023 alle ore 9.00, viene aperta, in modalità telematica (via posta elettronica), la riunione del Collegio dei Docenti del Corso di Dottorato di Ricerca in "Scienze delle Produzioni Vegetali e Animali", XXXV ciclo, come da convocazione inviata via posta elettronica il 13.06.2023, con i seguenti punti all'OdG:

1. Proposta di Commissione e data di esame finale dei dottorandi Mohamed ALLAM, Valentina BIGINI, Gloria GIOVENALI (XXXV ciclo)
2. Proposta di Commissione e data di esame finale dei dottorandi Luca MARCHETTI, Andrea TAFURI per l'acquisizione del titolo di *Doctor Europaeus* (XXXV ciclo)

Sono presenti: Prof.ssa Stefania ASTOLFI, Prof. Giorgio Mariano BALESTRA, Prof. Umberto BERNABUCCI, Prof.ssa Roberta BERNINI, Prof. Enio CAMPIGLIA, Prof.ssa Carla CARUSO, Prof. Raffaele CASA, Prof.ssa Carla CEOLONI, Prof. Giuseppe COLLA, Prof. Valerio CRISTOFORI, Prof.ssa Adalgisa GUGLIELMINO, Prof. Nicola LACETERA, Prof.ssa Katia LIBURDI, Prof. Roberto MANCINELLI, Prof.ssa Stefania MASCI, Prof. Andrea MAZZUCATO, Prof. Maurizio MICHELI, Prof. Rosario MULEO, Prof.ssa Mariella NOCENZI, Prof.ssa Maria Nicolina RIPA, Prof. Francesco ROSSINI, Prof. Roberto RUGGERI, Prof. Luca SANTI, Prof. Daniel Valentin SAVATIN, Prof. Francesco SESTILI, Prof. Cristian SILVESTRI, Prof. Stefano SPERANZA, Prof.ssa Anna Maria TIMPERIO, Prof. Eduardo Gabriel VIRLA, Prof. Andrea VITALI, Dott. Alberto BATTISTELLI, Dott. Eugenio BENVENUTO, Dott. Gianluca BURCHI, Dott. Aldo CERIOTTI, Dott.ssa Anna Maria D'ONGHIA, Dott.ssa Chiara FRAZZOLI, Dott. Angelo SANTINO, Dott.ssa Chiara VOLPI.

Sono assenti: Prof. Thierry GIARDINA, Prof. Lorenzo BOCCIA.

Svolge la funzione di Presidente la Prof.ssa Roberta BERNINI, Coordinatrice del Corso di Dottorato di Ricerca, e di Segretario verbalizzante la Prof.ssa Katia LIBURDI.

1. Proposta di Commissione e data di esame finale dei dottorandi Mohamed ALLAM, Valentina BIGINI, Gloria GIOVENALI (XXXV ciclo)

La Coordinatrice fa presente che i dottorandi Mohamed ALLAM, Valentina BIGINI, Gloria GIOVENALI (XXXV ciclo) hanno ricevuto i report dei due referee esterni con valutazione ottimo/eccellente e, a nome del Collegio dei Docenti, ha espresso loro le congratulazioni. Gli allegati sono parte integrante del presente verbale. Pertanto, i dottorandi sono ammessi all'esame finale.
In accordo al Regolamento di Ateneo, il Collegio dei Docenti propone quanto segue:
Commissione
Membri effettivi

- Prof.ssa Laura ERCOLI - Professore Ordinario, ssd AGR/02, Agronomia e coltivazioni erbacee Scuola Superiore Sant'Anna di Pisa, E-mail: laura.ercoli@santannapisa.it
- Dott.ssa Daniela PONTIGGIA - Ricercatore a t.d. - t. pieno (art. 24 c.3-b L. 240/10), ssd BIO/04, Fisiologia Vegetale, Università degli Studi di Roma La Sapienza, E-mail: daniela.pontiggia@uniroma1.it
- Prof. Mario PAGNOTTA - Professore Associato, ssd AGR/07, Genetica Agraria Università degli Studi della Tuscia, E-mail: pagnotta@unitus.it

Membri supplenti

- Prof.ssa Giulia De Lorenzo - Professore Ordinario, ssd BIO/04, Fisiologia Vegetale
  Università degli Studi di Roma La Sapienza, E-mail: giulia.delorenzo@uniroma1
- Dott.ssa Silvia Proietti - Ricercatore a t.d. - t. pieno (art. 24 c.3-b L. 240/10), ssd BIO/10, Biochimica
- Università degli Studi della Tuscia, E-mail: s.proietti@unitus.it

Data e ora
18 luglio, ore 10.30.
Modalità
Telematica, su richiesta dei Commissari.

2. Proposta di Commissione e data di esame finale dei dottorandi Luca MARCHETTI, Andrea TAFURI per l'acquisizione del titolo di *Doctor Europaeus* (XXXV ciclo)

La Coordinatrice fa presente che i dottorandi Luca MARCHETTI e Andrea TAFURI (XXXV ciclo) hanno ricevuto i report dei due referee esterni con valutazione ottimo/eccellente e, a nome del Collegio dei Docenti, ha espresso loro le congratulazioni. Gli allegati sono parte integrante del presente verbale.
Pertanto, i dottorandi sono ammessi all'esame finale. In accordo al Regolamento di Ateneo, il Collegio dei Docenti propone quanto segue:
Commissione
Membri effettivi

- Prof. Antonio GRANELL RICHART - Institute of Plant Molecular and Cell Biology (IBMCP), Ciudad Politécnica de la Innovación Universidad Politécnica de Valencia (Spain)
  E-mail: agranell@ibmcp.upv.es
- Prof.ssa Veronica GREGIS - Professore Associato, ssd BIO/18, Genetica
  Università degli Studi di Milano, E-mail: veronica.gregis@unimi.it
- Dott.ssa Sara CIMINI - Ricercatore a t.d. - t. pieno (art. 24 c.3-b L. 240/10), ssd BIO/04, Fisiologia Vegetale, Università Campus Bio-Medico di Roma, Roma, E-mail: s.cimini@unicampus.it

Membri supplenti

- Prof. Lorenzo FRIGERIO - School of Life Sciences, The University of Warwick (United Kingdom)
  E-mail: l.frigerio@warwick.ac.uk
- Prof.ssa Vittoria LOCATO, Professore Associato, ssd BIO/04, Fisiologia Vegetale
  Università Campus Bio-Medico di Roma, E-mail: v.locato@unicampus.it

Data
19 luglio, ore 9.00.
Modalità
Telematica, su richiesta dei Commissari.

La Coordinatrice fa presente che, sentito l'Ufficio Post Lauream, la modalità telematica delle prove di esame deve essere autorizzata dal Direttore Generale di Ateneo.
Il Collegio dei Docenti approva i punti all'OdG e il verbale seduta stante.
La riunione si conclude alle ore 16.00.

Il Segretario
Prof.ssa Katia LIBURDI

Il Presidente
Prof.ssa Roberta BERNINI

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report (template)

N.B. The following template should be intended as a flexible model. The actual report may be adapted by the reviewer according to his/her needs.

PhD student: Allam Mohamed

Title of the thesis: Impacts of sustainable agricultural practices on wheat crop production and quality

Reviewer (surname, name and affiliation): Nocente Francesca, Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria-Centro di ricerca Ingegneria e Trasformazioni agroalimentari, Roma.

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	x			
Suitability of the title with respect to the content		x		
Efficacy of the abstract	x			
Clarity of the aims	x			
Exhaustiveness of the introduction/state of art	x			
Suitability of the methodology	x			
Description of the experimental procedure	x			
Interpretation of the results	x			
Appropriateness of the discussion	x			
Completeness of references	x			
Overall evaluation	*x*			

General comments and remarks:

The PhD thesis of Dr. Allam covers the contemporary and important topic of sustainable agriculture. In particular, the candidate examines the impact of sustainable agricultural practices (reduced or no tillage, organic fertilization, crop rotation) on the yield of several crops (particularly wheat) and on soil quality, compared with conventional management. The thesis reports interesting findings on conservative agriculture, that also contribute to solve the dilemma 'organic *vs* conventional'.

The Thesis structure is well conceived, with a logical sequence of the topics covered, which allows to well interpret the results. State of art, research motivation, objectives, scope of the study and structure of thesis are clearly explained in Chapter 1. In the Chapter 2 and 3, the effect of soil management by using sustainable practices (conservation tillage, crop rotation, organic fertilization) on crop productivity, was assessed by two meta-analyses studies. The two meta-analyses combine and compare the results of many peer-review research papers that evaluated the effect of the transition from conventional to sustainable agriculture on different crops (cereals, legumes, oilseed, fiber) across four continents. Consequently, the analyses allowed to draw several conclusions concerning the feasibility of sustainable agricultural

practices, that otherwise would have been difficult to extrapolate from so many data and variables. In the Chapter 2, the meta-analysis was applied to understand the impact of environmental conditions (soil characteristics and climate) and of reduced tillage on the yield of several crops grown under conventional, organic and a mix of both fertilization management. Different cropping systems (monoculture vs. rotation) were also taken into account. In the Chapter 3 the meta-analysis was used to understand the effects of fertilization (organic or organic and mineral mixed) on soil organic carbon (SOC) and crop yield, under 3 tillage regimes (conventional, reduced and no-tillage). Different climatic conditions, soil properties, crop species and irrigation management were considered. The results of the two meta-analyses indicated conservative practices, besides agroecosystem benefits, as competitive with conventional one when a suitable combination of agricultural practices is applied, depending on crop species and environmental conditions. In the Chapter 4, a study of three-year trial was performed on durum wheat grown in a Mediterranean environment, to evaluate the effects of soil tillage practices (plough, subsoil, spading) and fertilization (inorganic vs organic) on yield, growth dynamics (chlorophyll concentration and Green Area) and other agronomical traits. The results indicate that in the Mediterranean area the use of subsoil tillage, combined with organic fertilization, allow to reach grain yield comparable to those from conventional agriculture.

An evaluation of the environmental and agronomic performance of widely cultivated commercial varieties of durum and bread wheat was discussed in Chapter 5, whereas Chapter 6 contains an overview of the results and general conclusion. In Chapter 5, the experimental design, performed over two years in two zone of Europe, includes: different soil tillage (conventional soil tillage, local common practice, subsoil tillage and spading machine); fungicides treatment (yes or not); fertilization management, i.e. mineral (according to local practice) and organic (compost). Stability Analysis of Genotype by Environment Interaction (GEI) was used to evaluate the environmental adaptation of the wheat cultivars in terms of yield and stability. The experimental procedure allowed to select more stable and high yielding varieties. The results are worthy of publication in peer-reviewed papers albeit with some minor improvements:

1) The candidate stated the investigation on biotic stresses: "The relative abiotic and biotic stress tolerance of five durum wheat and four bread wheat commercial varieties were investigated…….", but I don't entirely agree. Indeed, the effect of fungicide was evaluated on several traits such as plant height, grain yield, thousand kernel weight, test weight etc., but not in terms of plant disease control. If the candidate has data on wheat diseases (if they occurred), could add them to allow a comparison between treated and no treated samples, otherwise the sentence should be rephrased because it can be misinterpreted.

2) I suggest to use the most common term "test weight (TW)" instead of less common "Specific weight (SpW)".

3)The origin of cultivar Monastir should be France.

Each chapter of the thesis is well and clearly written and logically and sequentially organized. All graphical applications, figures and tables are made readable and clear.

The methodology and methods are consistent, appropriated and scientifically sound and described in a way that allows reproducing it. The candidate demonstrates a through mastery of the experimental methods described and a solid understanding of the state-of-the-art in the research area and the knowledge of the most important and current literature, that was chosen following logical criteria to perform the meta-analysis (Chapters 2-3), based on large number of references, related to the topics.

The results, obtained by using the appropriate statistical analysis, are presented and discussed clearly, in relation to the research of others authors, demonstrating a good understanding of the implications of the work in a broader scientific context.

The candidate Dr. Allam results as the first author in two of the published papers (Chapter 2 and 3) and the second author in the third published paper (Chapter 4), thus indicating its contribution in the main aspects of the thesis (conception of ideas, methodology). In the Chapter 5, it is not clearly stated his contribution in the research.

In conclusion, the reviewed thesis fulfills all requirements posed on theses aimed for obtaining PhD degree. I recommend the candidate Dr. Allam pass without further examination or amendment because his thesis reveals original results, that add knowledge to the international scientific community about sustainable agriculture.

The thesis is accepted:

- ☐ *In the present form*
- ☒ *After minor revisions*
- ☐ *After major revisions*

With major revisions, is it requested a revised version after 6 months?

- ☐ *YES*
- ☐ *NO*

Date 12/06/2023

Signature

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

PhD student: Mohamed Allam

Title of the thesis: IMPACTS OF SUSTAINABLE AGRICULTURAL PRACTICES ON WHEAT CROP PRODUCTION AND QUALITY

Reviewer (surname, name and affiliation): Saia Sergio, University of Pisa

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	X			
Suitability of the title with respect to the content	X			
Efficacy of the abstract		X		
Clarity of the aims	X			
Exhaustiveness of the introduction/state of art	X			
Suitability of the methodology		X		
Description of the experimental procedure	X			
Interpretation of the results	X			
Appropriateness of the discussion	X			
Completeness of references	X			
Overall evaluation	*X*			

General comments and remarks:

The thesis by Mohamed Allam focuses on three main management techniques that may directly and strongly influence the overall sustainability of cropping systems, namely the soil management, the fertilization strategy and application of fungicides, the lesser of which jointly with a side analyses on 2 wheat species. The thesis yield both literature date on two interesting and mutually supporting metanalyses and 2 experiments in multiple environments (year and locations)

The thesis has a good flowing and good explanation of its structure, and 3 out of 4 research chapters were already published in peer-reviewed journal, that indeed provide a further protection of the robustness of the results.

The general introduction (Chapter 1) set up the general bases for a discussion on the 3 main pillars of the sustainability, not excluding the need of increasing the yield at a global, and often local, scales to support the food security. My advise is to try to avoid excessive striking sentences regarding the health risks of pesticides. Indeed, pesticides pose risks, but at least in the developed countries the health risks are being efficiently reduced by the legislation, as also confirmed by the population analyses risk factors. Indeed, this is at the one time a good point for the environmental (of which health is in) sustainability and a bad point for the social sustainability, since these discrepancies in the legislations poses concerns on the ethical acceptability when foods are consumed in a nation that (correctly) prohibited given tools but imported those foods from other nations where these tools are allowed

Chapter 2 and 3 highlighted that soil rather than fertilization management may be important to increase yields while increasing the yield per input ratio, i.e. the rationale of the sustainable intensification. So far, the author found that variability yielded from the studies found in the chapter 3 is very high and may limit, at the present status of the literature, to infer on this topic.

Chapter 4 elegantly answer to lack of knowledge and merges the topics of the chapter 2 an 3 in a field experiment under 3 cropping season with variable water to energy (i.e. potential ETP) ratio and including a well characterized organic material used as amendment, namely a compost from urban waste (notably with a ash concentration of 55.6% on the d.w., that considering the moisture of 19.4%, implies a ash concentration on the fresh compost of around 44.8%). The student tested

the application of the compost compared to the application of similar amount of mineral N as those in the compost and under 3 soil management practices with variable degree of soil disturbance. In this chapter, due to the high amount of treatments compared (a total of 12-18 treatments if considering that 2 or 3 years were reported depending on the variable), a post- hoc with higher protection than the Fisher may be of help. So far, when analyzing the main factor or 2 factors interaction, since treatments collapse to only 2, 3 or 6, Fisher is ok. A suggestion for further studies is collapsing the cropping season as a random variable, and not analyzing it separately.

Chapter 5 slighly diverges by the previous chapter since it deal with fungicides treatments and genotypic differences, in 2 contrasting locations and 2 contrasting cropping seasons. Results on this chapter are welcome, and highlighted in the general abstract of the thesis. So far I suggest some minor changes on this chapter:

- Specify if there is some information on the potential inoculum of the fungal pathogens in these areas;
- Specify if there is a potential genetic resistance to fungal pathogens of the genotypes used
- Change the data of heading date in "days from the 1st of april", that better explain the earliness of the genotypes and can give a highlight on the environmental conditions during the grain filling, which may be related to the pathogenic attacks.

These specification can strongly help the reader, and authors to publish, since it is uncommon that in areas or seasons with relatively high environmental moisture, fungicides application fail in providing a yield boost.

In addition, I suggest to slightly expand both the general thesis abstract and to conclusions, since these are frequently the most read parts of the thesis.

The thesis is accepted:

- ☐ ***In the present form***
- ***X After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ***X NO***

Date	Signature
13/06/20023	Sergio Saia
	(electronic signature)

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report

PhD student: Valentina Bigini

Title of the thesis: Engineering danger sensing and signaling in plant immunity: use of oligosaccharins to enhance durum wheat resistance to fusariosis

Reviewer (surname, name and affiliation): Ferrari Simone, Dip. Biologia e biotecnologie "Charles Darwin", Sapienza Università di Roma

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	X			
Suitability of the title with respect to the content	X			
Efficacy of the abstract	X			
Clarity of the aims	X			
Exhaustiveness of the introduction/state of art	X			
Suitability of the methodology		X		
Description of the experimental procedure	X			
Interpretation of the results				
Appropriateness of the discussion				
Completeness of references	X			
Overall evaluation	*X*			

General comments and remarks:

This thesis describes a detailed study of the effectiveness of oligogalacturonides as inducers of resistance against F. graminearum in durum wheat, and of the use of the chimeric protein OG-Machine to engineer wheat plants more resistant to fusariosis. The introduction is quite complete and provides the necessary background to understand the dissertation; the experimental procedures and results are described with clarity and in detail. The obtained results are critically discussed and are of great interest for the scientific community and in particular for those interested in plant-pathogen interactions. Overall, the thesis is very well written and organized, and requires only a minor revisions. In particular, the candidate should comment on the use of seedlings, rather than, for instance, spikes, for some experiments (in particolar, for RNAseq analyses. To what extenct are results of coleoptile infections comparable to spike infections? Another point that should be better explained is the DEG analysis (Fig. 26); as I understand it, both up- and down-regulated genes are grouped in each DEG group. This means that some genes might be up-regulated by one condition and down-regulated in another, but they are considered in common between the two groups. It would be nice to have the same Venn diagrams for genes up-regulated only or down-regulated only in the three groups. For GO analysis, FDR values in the case of elicitors alone are very high (it is usually recommended to use a threshold of 10^{-5}). In qPCR experiments, TdPR1 expression was analyzed; what was its expression pattern in the RNAseq experiments? Why did not she analyzed some of the top DEG genes (e.g. from Fig. 27)? The candidate should also comment on the reduced Fg TRI

gene expression after OG treatment and in OGM plants: does it correlate with the degree of fungal growth reduction, or might it be due to some plant response that affects TRI production (e.g. ROS production or hormone regulation of TRI genes)?

Other minor comments: ANOVA analysis in Fig. 24B might be more informative about differences among treatments. Fig. 25: it would help if the different labels (A, B, C,..) are also included in the legend next to the group name (e.g. A, mock; B, OG 10 ug/ml, ecc…)

The thesis is accepted:

- ☐ ***In the present form***
- ***X*** ***After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ***X*** ***NO***

Date 13-5-2023

Signature

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report (template)

N.B. The following template should be intended as a flexible model. The actual report may be adapted by the reviewer according to his/her needs.

PhD student: Valentina Bigini

Title of the thesis: Engineering danger sensing and signaling in plant immunity: use of oligosaccharins to enhance durum wheat resistance to fusariosis

Reviewer (surname, name and affiliation): Mattei Maria Benedetta, University of L'Aquila

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	X			
Suitability of the title with respect to the content	X			
Efficacy of the abstract	X			
Clarity of the aims	X			
Exhaustiveness of the introduction/state of art	X			
Suitability of the methodology	X			
Description of the experimental procedure	X			
Interpretation of the results	X			
Appropriateness of the discussion		X		
Completeness of references	X			
Overall evaluation	*X*			

General comments and remarks:

In her Thesis, Bigini has studied the effect of treatment of OGs in activating defense responses in durum wheat and in triggering resistance against F. graminearum. Then she has generated and analyzed transgenic durum wheat lines expressing the chimeric fusion between PG and PGIP (OG-Machine) under the control of a pathogen-inducible promoter, and observed in these transgenic lines a significant decrease of FHB disease severity and strong reduction of yield losses associated with *F. graminearum* infection.

The resulta are very interesting and the work is well described, both in the methodology and in the interpretation of the results. In the discussion there are some repetitions of what was already well described in the introduction and aim of the thesis (e.g. all the known effects of OGs reported on page 103, or sentences such as "manipulation of plant innate immunity by engineering OG sensing and signaling could be a valid approach to strengthen plant immune responses" that are more suited to the aim of the thesis). I would prefer a more focused discussion, while other parts could be developed more,

such as the observed difference between chitosan and OGs in inhibiting plant morphological parameters, I wonder if this finding could be supported by transcriptomic data.

Here are a few suggestions and detailed remarks:
The abbreviation for Fusarium head blight (FHB) is correctly reported on page 9, but then either the full name or the full name followed by the abbreviation it is repeated a number of times (page 11, 49, 55, 66, 103).
The word "undermining" is used twice (pag 8 and 49) in a not appropriate meaning. Undermine means to weaken, impair, sabotage, while the context requires a term with a different meaning (highlight, call attention to, emphasize). These sentences should be rephrased.

The thesis is accepted:

- ***X In the present form***
- ☐ ***After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ☐ ***NO***

Date
29/05/2023

Signature

M Benedetta Mattei

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report (template)

N.B. The following template should be intended as a flexible model. The actual report may be adapted by the reviewer according to his/her needs.

PhD student: Giovenali Gloria

Title of the thesis: Analysis of the response to heat and water-deficit stress in durum wheat introgression lines with segmental transfers from wild *Thinopyrum* species

Reviewer (surname, name and affiliation): Borrelli Grazia Maria, Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria, Centro di Ricerca Cerealicoltura e Colture Industriali, sede di Foggia

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	X			
Suitability of the title with respect to the content	X			
Efficacy of the abstract	X			
Clarity of the aims	X			
Exhaustiveness of the introduction/state of art	X			
Suitability of the methodology	X			
Description of the experimental procedure	X			
Interpretation of the results	X			
Appropriateness of the discussion	X			
Completeness of references	X			
Overall evaluation	X			

General comments and remarks:

La tesi è organizzata in diversi capitoli, ciascuno con un proprio titolo e obiettivo. La sequenza dei capitoli è adeguatamente organizzata e segue un ordine logico. Per ciascuno di essi, l'Abstract descrive coerentemente lo scopo della ricerca e i principali risultati.

L'Introduzione generale, intesa come uno stato dell'arte (Chapter 1), e l'Introduzione dei successivi capitoli sono approfondite e aggiornate. Lo scopo delle ricerche e il loro significato sono chiaramente descritti.

La metodologia adottata è appropriata e la procedura sperimentale è descritta in modo dettagliato e riproducibile.

I Risultati sono descritti e interpretati correttamente. La Discussione di ciascun capitolo è appropriata e coerente, anche in relazione a riferimenti bibliografici adeguati e aggiornati.

Nel complesso, questa tesi risulta completa, approfondita e ben articolata.

Specifiche osservazioni e indicazioni di alcune correzioni da apportare al testo sono descritte di seguito.

1. Controllare i riferimenti bibliografici, soprattutto nel Capitolo 1, dove, rispetto al testo, mancano nelle References: Ceoloni et al. 2015 (anche in Capitolo 4), Dvorak et al., 1988 e Mullan et al. 2007. Ci sono due referenze "Liu et al. 2015", senza che esse siano distinte nel testo, mentre c'è un "Chen 2005", non citato nel testo. Indicare le lettere "a" e "b" nei due riferimenti Ceoloni et al. 2005, come nel testo. Dopo "Objectives" ci sono più riferimenti bibliografici rispetto a quelli citati nel testo, mentre manca Kuzmanovic et al. 2019. In aggiunta, essi non sono nell'ordine alfabetico, come negli altri capitoli. Nelle References del Capitolo 2, Ceoloni et al. 2017 non è citato nel testo, mentre Ceoloni et al. 2014 è ripetuto due volte.

2. Per introdurre il termine "drought", potrebbe essere meglio spostare la frase di pag. 29 "The term "drought" generally indicates an extended period of abnormal below average natural water availability… (Hasanuzzaman et al., 2018 and references therein)." alla penultima riga di pag. 28, dopo "As well as HS phenomena, also water deficit condition …. of the Mediterranean area is not uncommon."

3. Capitolo 2. Campionamenti: Non è chiaro se per la determinazione delle attività enzimatiche antiossidanti siano stati utilizzati estratti enzimatici ottenuti da campioni di foglia appena prelevati oppure congelati dopo l'estrazione: precisare.

4. Prestare attenzione alla denominazione delle "nested" NIRL in alcune tabelle dei capitoli 2 e 4.

5. Nel Capitolo 5 ci sono alcune inesattezze nella numerazione delle Figure e Tabelle: rivedere e correggere. Inoltre, vanno uniformati i decimali nelle tabelle 5.3 e 5.4.

6. Come fatto per gli altri capitoli, suggerisco di aggiungere delle brevi conclusioni alla Discussion del Capitolo 5 (pag. 185).

7. Sono state trovate alcune ripetizioni di termini/verbi, tra cui: 1) pag 14. "climate resilience of crops"; pag. 184: "Among the new evidence emerged from the present work …… emerged among the best performing genotypes", per le quali si suggerisce di usare sinonimi.

The thesis is accepted:

- ☐ ***In the present form***
- ***X After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ☐ ***NO***

25/05/2023

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report (template)

N.B. The following template should be intended as a flexible model. The actual report may be adapted by the reviewer according to his/her needs.

PhD student: Gloria Giovenali

Title of the thesis: Analysis of the response to heat and water-deficit stress in durum wheat introgression lines with segmental transfers from wild Thinopyrum species

Reviewer (surname, name and affiliation): Michela Janni, CNR

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	X			
Suitability of the title with respect to the content		X		
Efficacy of the abstract	X			
Clarity of the aims		X		
Exhaustiveness of the introduction/state of art	X			
Suitability of the methodology	X			
Description of the experimental procedure	X			
Interpretation of the results	X			
Appropriateness of the discussion	X			
Completeness of references	X			
Overall evaluation	*X*			

General comments and remarks:

The PhD thesis focuses on the exploitation of innovative durum wheat genetic material to overcome the ongoing challenges imposed by climate changes. The work reposts the characterization of DW-*Thinopyrum* spp. near-isogenic recombinant lines (NIRLs) under heat stress and the combination of drought and heat stress. The seedling stage has been selected as target for the analysis. The study is based on high quality methods that perfectly fit with the objectives of the study.

The results are convincing and highlight the high potential of the genetic material and have been published with success.

The quality of writing is high, the state of the art, the basic concepts, as well as the methods are clearly exposed, also thanks to figures and tables, the level of depth and detail is adequate, the references are adequate in number, consistent and updated.

The thesis consistently increases the knowledge in the response to heat stress and the combination for heat+drought stresses.

The thesis is accepted:

- ☐ ***X In the present form***

- ☐ ***After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ☐ ***X NO***

Date 25/05/2023

Signature

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report (template)

N.B. The following template should be intended as a flexible model. The actual report may be adapted by the reviewer according to his/her needs.

PhD student: Luca Marchetti

Title of the thesis: Development of a novel nanotechnological approach for the treatment of medullo-blastoma

Reviewer (surname, name and affiliation): Dr. Pablo Scodeller, Ramon y Cajal Researcher, Principal Investigator at Centro Nacional de Biotecnologia (CNB-CSIC), Madrid, Spain

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	x			
Suitability of the title with respect to the content	x			
Efficacy of the abstract	x			
Clarity of the aims	x			
Exhaustiveness of the introduction/state of art	x			
Suitability of the methodology	x			
Description of the experimental procedure	x			
Interpretation of the results	x			
Appropriateness of the discussion	x			
Completeness of references		x		
Overall evaluation	*x*			

General comments and remarks: The thesis is written in a clear and concise way, the introduction is clear and the results are presented in a way that is detailed yet easy to read. The figure legends do not contain excessive information and the figures are easy to interpret. The synthesis, functionalization and loading of TBSV is well characterized. The experiments contain the adequate controls, and the candidate has done a good job in quantifying certain critical parameters such as drug loading, numer of peptides on the surface, and size and charge of the wild type and modified TBSV. Importantly, in a more general way, he has shown that targeting peptides fused to the virion protein of TBSV, can enhance the selective cytotoxicity and also the tissue homing properties. These findings open the door to future modifications using peptides to target specific tumor compartments or other diseases. The approach and experimental design is elegant, and the conclusions are well suported by the evidence. The use of peptide-guided TBSV introduced by the candidate heralds promising uses of this system in theranostics of neuroblastoma but also other diseases, as the current toolbox of targeting peptides available extends to other diseases such as brain injuries, Alzheimer's disease.

The thesis is accepted:

- ☐ ***X In the present form***
- ☐ ***After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ☐ ***X NO***

Date: May 24, 2023

Signature

SCODELLER PABLO DAVID - DNI Y9178205T

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Date: 2023.05.24 17:29:15 +03'00'

Pablo Scodeller

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report (template)

N.B. The following template should be intended as a flexible model. The actual report may be adapted by the reviewer according to his/her needs.

PhD student: Luca Marchetti

Title of the thesis: Development of a novel nanotechnological approach for the treatment of medullo-blastoma

Reviewer (surname, name and affiliation): Warzecha, Heribert; Technical University of Darmstadt, Germany

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	x			
Suitability of the title with respect to the content		x		
Efficacy of the abstract		x		
Clarity of the aims	x			
Exhaustiveness of the introduction/state of art	x			
Suitability of the methodology	x			
Description of the experimental procedure	x			
Interpretation of the results	x			
Appropriateness of the discussion	x			
Completeness of references		x		
Overall evaluation	*x*			

General comments and remarks:

The candidate has provided a scientifically sound and well structured thesis, investigating novel approaches in targeting and understanding therapy options for camcer types like medullo-blastoma.

The introduction is detailed, well written, and covers all the various aspects which are addressed in the thesis. It describes very well the state-of-the art in various fields from oncology to plant biotechnology and virology.

The scientific work is divided into three chapters, describing VNP platform development on the basis of Tomato Bushy Stunt Virus (TBSV), functional testing of drug delivery via TBSV particles in a mouse model, and the modification of TBSV particles via genetic fusion with targeting peptides and their testing. Luca marchett not only has shown, that TBSV particles can be packed with cytotoxic cargo but then specifically delivered to target cells followed by specific uptake und activation. Choice of petides was guided by molecular docking studies and effectiveness thoroughly tested in animal models, which proved the effectiveness of the approach.

The research showed the suitability of plant VNPs as tools for tumor targeting and treatment and has proven potential also for other diseases, e.g. in the pulmonary tract.
As indicated in the thesis the three chapters are basis for three manuscripts. In this respect it would be helpful to get some information about the manuscripts and possible contributions of coworkers.
Luca Marchetti excellently showed that he can plan and conduct sound research projects and provided new insights into an exciting research field. I highly recommend to accept this thesis.

The thesis is accepted:

- ***X In the present form***
- ☐ ***After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ***X NO***

Date: 26.5.2023

Signature

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

PhD student: **Andrea Tafuri**

Title of the thesis: **"Exploring variability in free asparagine content to reduce the acrylamide-forming potential of wheat grain"**

Reviewer: Paola Tosi, School of Agriculture, Policy and Development University of Reading, UK

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research		x		
Suitability of the title with respect to the content	x			
Efficacy of the abstract	x			
Clarity of the aims	x			
Exhaustiveness of the introduction/state of art			x	
Suitability of the methodology	x			
Description of the experimental procedure	x			
Interpretation of the results		x		
Appropriateness of the discussion		x		
Completeness of references	x			
Overall evaluation				

General comments and remarks:

This is a well structured and tidily presented PhD thesis, and although most of the research is descriptive, rather than hypothesis driven, it is topical, it advances knowledge in the field and its outcomes are highly relevant to the agri-food sector. The quality of the research produced is fit for publication, and large part of it has, in fact, already been accepted for publication. It is, overall, a very good thesis.

However, I believe the introduction/s could have been more exhaustive: at the moment, some of the information/results from literature in merely listed in the form of statements (although referencing was very good throughout); I suggest there should be more explanation provided on what those results meant, what are the possible mechanisms behind them. I also think the data produced could have been more thoroughly interrogated/discussed.

In summary, the thesis would benefit from having the introduction slightly expanded to give more in-depth information of the state of the art and current understanding of the specific topic. I will not need to see a revised version. I include the thesis document with my comments incorporated.

The thesis is accepted:

- ☐ ***After minor revisions***

Date 26-5-2023 Signature

PhD Program in Plant and Animal Science, University of Tuscia, Viterbo (Italy)

Coordinator: Prof. Roberta BERNINI

Reviewer report (template)

N.B. The following template should be intended as a flexible model. The actual report may be adapted by the reviewer according to his/her needs.

PhD student: Andrea Tafuri

Title of the thesis: Exploring variability in free asparagine content to reduce the acrylamide-forming potential of wheat grain

Reviewer (surname, name and affiliation): Barro, Francisco; Institute for Sustainable Agriculture, University of Córdoba

Scientific quality	**Excellent**	**Good**	**Fair**	**Poor**
Originality of the research	X			
Suitability of the title with respect to the content	X			
Efficacy of the abstract	X			
Clarity of the aims		X		
Exhaustiveness of the introduction/state of art	X			
Suitability of the methodology	X			
Description of the experimental procedure	X			
Interpretation of the results	X			
Appropriateness of the discussion	X			
Completeness of references	X			
Overall evaluation	*X*			

General comments and remarks:

In this thesis, exploratory results on acrylamide (AA) content in a collection of durum and bread wheat varieties in different environments are presented. They identify varieties with low AA content that could be useful for their integration into breeding programs. In addition, a chapter is devoted to determine the AA content in a product of high consumption in Italy such as pizzas by using refined flour, and whole grain. Flour. The results of this chapter are innovative as there is no legislation in this field. Finally, the basis for reducing the AA content in durum wheat using biotechnological techniques is ongoing. Altogether, the manuscript is an excellent high-quality work.

The thesis is accepted:

- ***X In the present form***
- ☐ ***After minor revisions***
- ☐ ***After major revisions***

With major revisions, is it requested a revised version after 6 months?

- ☐ ***YES***
- ***X NO***

Date: May 26, 2023

Signature

BARRO LOSADA FRANCISCO - 30474943N

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