DETAILED RESPONSES TO REVIEWER COMMENTS.

The authors would like to thank the Editor and Reviewers for the useful suggestions to improve the manuscript. We have revised the manuscript based on the comments from the Reviewers and Editor. We believe that we have fully addressed all the points raised by the Reviewers and Editor and would like to ask the Editor to consider the manuscript for publication. A detailed reply to the Reviewers' comments is provided below, and all revisions in the main text are shown as tracked changes.

Comments

Reviewer #1:

1. L10 first write Selenium and then Se, so the readers know it later in your ms. Selenium (Se) is an ….

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 10:

Selenium (Se) is an essential trace element that plays a crucial role in maintaining the health of humans, animals, and certain plants.

2. L17 and L20 use abbreviations here for selenium.

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 16-18:

Agronomic strategies in Se biofortification aim to enhance the availability of exogenous Se in crops. Concurrently, genetic strategies focus on improving a crop's capacity to uptake, transport, and accumulate Se.

Line 22-24:

The supplementation of Se biofortified foods is gradually emerging as an effective approach to promote human dietary health and alleviate hidden hunger.

3. L20 use crop quality instead of plant quality.

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 28-30:

Furthermore, we highlight Se's role in enhancing crop quality and offer perspective on Se biofortification in crop improvement, guiding future mechanistic explorations and applications of Se biofortification.

4. L31-33 Please use this citation “Influence of Nano Silicon and Nano Selenium on Root Characters, Growth, Ion Selectivity, Yield, and Yield Components of Rice (Oryza sativa L.) under Salinity Conditions”.

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 35-37:

These selenoproteins participate in several vital metabolic processes in the human body, such as antioxidant defence, thyroid hormone production, and cardiac metabolism[1, 2].

5. L35 please use only the abbreviation of selenium, why authors sometimes use Se and some others use Se, check this issue in whole ms.

A: Thank you for the suggestions. We have addressed the abbreviation issues throughout the entire manuscript. The detailed revisions are shown as follows:

Line 37-39:

Inadequate Se intake can impair various functions related to human health, leading to a weakened immune system, thyroid dysfunction, and decreased male fertility[3, 4].

6. L45-48 Here I suggest the authors to use following citation “Integrated Application of Selenium and Silicon Enhances Growth and Anatomical Structure, Antioxidant Defense System and Yield of Wheat Grown in Salt-Stressed Soil”.

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 49-51:

The levels of Se absorption and accumulation in crops are closely linked to the genetic regulation of Se transport and metabolic mechanisms within crops[5].

7. L44-88 Why the authors focus on plant breeding? They should focus on the agronomic part in terms of Se biofortification. So why the following text? Traditional breeding methods combine Se-rich varieties using genetic methods such as hybridization to enhance the Se-rich capacity of the target variety. In contrast, genetic engineering

technology has the potential to efficiently introduce genes from naturally Se-rich crops into staple crops, breaking through the limitations of the single-species genetic pool.

A: Thank you for the comments. We sincerely apologize for not clearly delineating the discussion on agronomic strategies and genetic strategies for Se biofortification in this section, leading to misunderstanding. This part serves as a brief introduction to genetic strategies, mentioning both conventional breeding and transgenic methods. To prevent confusion, the genetic strategy for Se biofortification has been elaborated in a new paragraph. The detailed revisions are shown as follows:

Line 88-97:

Genetic strategies for Se biofortification aim to enhance the Se uptake and accumulation capabilities of target crops. This can be achieved through either conventional breeding or transgenic techniques. This approach is considered a sustainable, long-term method[6]. Traditional breeding methods involve combining Se-rich varieties through genetic methods, such as hybridization, to enhance the Se-rich capacity of the target variety. In contrast, transgenic techniques have the potential to efficiently introduce genes from naturally Se-rich crops into staple crops. This approach can overcome the limitations associated with the single-species genetic pool. However, transgenic technology still raises significant ethical concerns in some countries, which makes its widespread adoption and application challenging[7].

8. L116-127 use suitable citations for this text.

A: Thank you for the comments. We have added relevant citations. The detailed revisions are shown as follows:

Line 131-139:

Se biofortification agronomic strategies can be categorized into Se fertilizer strategies and agronomic management strategies. In this chapter, we initially summarize the crucial role of Se fertilizer strategies, including how to adjust the type [8-10] and dosage of Se fertilizers [11, 12] , and the application site [13, 14] and timing of Se [15, 16]. Subsequently, we consolidate and discuss the impacts of agronomic management strategies on Se biofortification, encompassing crop rotation [17-19] and intercropping [20-22], soil [23-25] and water management [26-28], as well as microbial inoculation [29-31]. As the most accessible methods for farmers, agronomic strategies play an irreplaceable role in Se biofortification practices.

9. L117-119 where is this previous research? Previous research has shown that adjustments in Se fertilizer strategies can significantly impact the results of Se biofortification, including the type and dosage of Se fertilizers, as well as the location and timing of Se application

A: Thank you for the comments. We sincerely apologize for the oversight in not citing relevant research at this point. We have now added citations for the pertinent studies. The detailed revisions are shown as follows:

Line 131-139:

Se biofortification agronomic strategies can be categorized into Se fertilizer strategies and agronomic management strategies. In this chapter, we initially summarize the crucial role of Se fertilizer strategies, including how to adjust the type [8-10] and dosage of Se fertilizers [11, 12] , and the application site [13, 14] and timing of Se [15, 16]. Subsequently, we consolidate and discuss the impacts of agronomic management strategies on Se biofortification, encompassing crop rotation [17-19] and intercropping [20-22], soil [23-25] and water management [26-28], as well as microbial inoculation [29-31]. As the most accessible methods for farmers, agronomic strategies play an irreplaceable role in Se biofortification practices.

10. L208-220 Authors should use this ref “Optimizing Inputs Management for Sustainable Agricultural Development”.

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 233-234:

Recently, there has been a growing interest in Se biofortification, and several studies have observed the significant role of crop rotation in Se biofortification[32].

11. I want the authors to also add the mechanisms of Se and how it can affect water use efficiency and fertilizer use efficiency?

A: Thank you for the comments. We sincerely apologize for the confusion caused by the wording in Section 2.2.2. We did not intend to imply an impact of Se biofortification on water use efficiency. Since irrigation is a common agricultural practice, we aimed to discuss the influence of irrigation on Se and biofortification here. Based on previous research, we found that irrigation primarily affects Se fertilizer efficiency by leaching Se from the soil and

altering the bioavailability of Se in the soil. A more detailed summary of this is provided in Section 2.2.2. To avoid misunderstanding, we have revised this section. The detailed revisions are shown as follows:

Line 308-316:

However, in some studies, the content of bioavailable Se in the soil has increased due to changes in soil redox conditions and pH caused by irrigation. For instance, Wang et al. found that aerobic irrigation increased soil pH, redox potential, and bioavailable Se content to a certain extent, resulting in an increase in Se content in crop grains [33]. Overall, the impact of irrigation on Se biofortification is complex. Aerobic irrigation leads to the conversion of Se into more bioavailable forms, but Se dissolution and migration during irrigation reduce soil Se content. Therefore, further research is needed to elucidate the mechanisms of irrigation's impact on soil Se content under different soil conditions.

12. L223-224 In that text, authors can use this citation “Effect of Different Sowing Methods on Growth, Yield and its Components of Wheat Under Intercropping Patterns with Egyptian Clover Var. Fahl”.

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 246-248:

According to the stress gradient hypothesis [34], as environmental stress increases, crops are more likely to exhibit net positive (facilitative) interactions with other crops [35, 36].

13. How you can explain that the application of Se can reduce the contact of other trace elements such as Cd, Pb, As etc.?

A: Thank you for the comments. In this review, our focus is on summarizing the impact of different Se biofortification strategies on the outcomes related to heavy metals (HMs). According to the summary by Feng et al., due to the commonality of HMs, the mechanisms through which Se affects these elements are primarily regulated by reactive oxygen species (ROS) and antioxidants, inhibition of HM uptake and translocation, changes in HM forms, reconstruction of cell membrane and chloroplast structure, and the restoration of the photosynthetic system [37]. Therefore, when discussing the mechanisms of Se 's impact, we have categorized these different elements collectively without detailed differentiation. We have used Hg and Cd as representatives to introduce the effects of Se on HM behavior (including in soil and within plant tissues).

14. L237-238 I suggest always the authors can give some text for background and end the text with some previous studies, please use this “Additions of optimum water, spent mushroom compost and wood biochar to improve the growth performance of Althaea rosea in drought-prone coal-mined spoils”.

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. We have added recommended citations and more specific studies to substantiate our viewpoints. The detailed revisions are shown as follows:

Line 266-298:

Soil porosity plays a crucial role in influencing root growth and function, the transport of solution ions to the crop root surface, and processes like leaching of solutes in the rhizosphere [38]. Soil compaction is a process that reduces soil porosity and increases bulk density, leading to changes in soil chemical properties and biodiversity [39]. Appropriate soil compaction can reduce soil porosity, increase contact between the rhizosphere surface and soil solution, and enhance the crop's absorption of trace elements from the soil [40, 41]. For instance, Zhao et al. suggested that restricted root growth in compacted soil may contribute to a significant decline in Se concentration in wheat grains [28]. Excessive compaction, however, can result in oxygen deficiency in soil pores. This leads to the reduction of biologically available Se to forms that plants cannot absorb [42]. In agricultural practices, to prevent severe soil compaction, soil amendments [43] or tillage methods [44] can be employed to regulate soil porosity. Tillage significantly influences the physical and chemical properties of soil [45], as well as the form and distribution of elements. [44, 46]. Some studies have explored the role of tillage in Se biofortification. Lessa et al. discovered that the tillage process reduced Se adsorption in the soil [47]. It brought Se from deeper soil layers to the surface, thereby increasing the crop-available Se content. Similarly, Ozpinar et al. reported varying degrees of Se concentration increases in all tissues of corn under three tillage systems (plow, rotary, and chisel) [25]. However, conflicting conclusions arise from Lopez-Bellido et al.'s work, suggesting that no-till systems do not induce stronger soil reducing conditions than traditional tillage systems [48]. Tillage systems seemingly do not affect wheat's Se uptake and accumulation. These contradictory findings may be related to soil moisture content, organic matter content, and biodiversity. Previous research indicates that soil moisture contributes to maintaining soil structure and enhancing soil resistance to compaction [49]. The presence of water promotes substance cycling in the soil, potentially influencing Se 's chemical properties in the soil and the process of crop Se absorption. Additionally, soil organic matter and soil biology are crucial factors influencing soil redox conditions. These factors are likely essential

reasons for variations in Se biofortification effects observed in different tillage studies. It can be concluded that soil compaction/tillage can influence Se biofortification in various ways (increasing/decreasing bioavailable Se content or promoting/inhibiting crop growth) [50]. Further work is needed to elucidate the geochemical behaviour of Se in these agronomic management practices and reveal the detailed processes by which agronomic management influences Se biofortification.

15. L261-262 The authors here should add suitable citation, here is one “Interaction effects of nitrogen source and irrigation regime on tuber quality, yield, and water use efficiency of Solanum tuberosum L.”

A: Thank you for the suggestions. We appreciate your kind suggestions and have amended the manuscript accordingly. The detailed revisions are shown as follows:

Line 301-303:

Irrigation provides a temporary Se reservoir for crops, significantly influencing their Se concentration and forms [51, 52].

16. Conclusions and perspective: In this section, you should focus on the most important thing that you want to show for the readers, so please kindly make it deeper and revise it.

A: Thank you for the suggestions. We have rewritten this section based on the suggestions provided. The detailed revisions are shown as follows:

Line 620-642:

In recent years, researchers have made significant progress in optimizing Se biofortification methods and expanding the species that can be fortified. They have also preliminarily elucidated the response mechanism of crops to exogenous Se. In addition, more and more studies have shown that the significance of Se biofortification is not limited to supplementing human Se. The impact of Se biofortification on other nutrients in crops indicates that Se biofortification has potential health value for humans. Therefore, the choice of Se biofortification strategy should be determined according to actual needs. For most Se - deficient populations living in underdeveloped and low- Se areas, increasing the organic Se content of crops is still the primary goal. Therefore, it is appropriate to choose staple crops for Se biofortification and use Se fertilizers to quickly increase soil and crop Se content. For high-income populations in developed areas, the impact of Se biofortification on other nutrients in crops may be more worthy of attention. Due to the large differences in the impact of Se on different nutrients in crops, non-staple crops should be selected for Se biofortification to avoid nutritional imbalances. The significance of this review is to provide

the feasibility and advantages of Se biofortification for different crop needs, which is conducive to expanding the application scenarios of Se biofortification. Future Se biofortification research should pay attention to reducing the excessive use of Se fertilizers and combining biotechnology to improve the absorption and accumulation capacity of crops for Se. In addition, the mechanism of Se -induced crop growth and quality changes are not yet clear, and it is necessary to combine botany, genetic engineering, and omics research to further reveal the non-biological stress tolerance mediated by Se. Finally, it is necessary to combine clinical medicine to fully evaluate the health effects of Se biofortified crops on humans.

17. Good luck. Comments on the Quality of English Language: minor edits are needed for English.

A: Thank you for your well wishes. We have made appropriate adjustments to the English language of the manuscript to enhance readability and understanding. For example, the following sentence has been modified:

Line 13-16:

Original text: Se biofortification refers to an agricultural procedure that harnesses the mechanisms of crop uptake and the accumulation of exogenous Se through agronomic and genetic strategies to produce Se-enriched crops, ultimately promoting human health.

After modification: Se biofortification is an agricultural process that employs agronomic and genetic strategies. Its goal is to enhance the mechanisms of crop uptake and the accumulation of exogenous Se, resulting in the production of crops enriched with Se. This process ultimately contributes to promoting human health.

References

1. Rayman, M. P. Selenium and human health. *Lancet* **2012,** *379* (9822), 1256-1268.
2. Badawy, S. A.; Zayed, B. A.; Bassiouni, S.; Mahdi, A. H.; Majrashi, A.; Ali, E. F.; Seleiman, M. F. Influence of nano silicon and nano selenium on root characters, growth, ion selectivity, yield, and yield components of rice (Oryza sativa L.) under salinity conditions. *Plants* **2021,** *10* (8), 1657.
3. Hatfield, D. L.; Tsuji, P. A.; Carlson, B. A.; Gladyshev, V. N. Selenium and selenocysteine: roles in cancer, health, and development. *Trends in Biochemical Sciences* **2014,** *39* (3), 112-120.
4. Roman, M.; Jitaru, P.; Barbante, C. Selenium biochemistry and its role for human health. *Metallomics* **2014,** *6* (1), 25-54.
5. Taha, R. S.; Seleiman, M. F.; Shami, A.; Alhammad, B. A.; Mahdi, A. H. A. Integrated Application of Selenium and Silicon Enhances Growth and Anatomical Structure, Antioxidant Defense System and Yield of Wheat Grown in Salt-Stressed Soil. *Plants-Basel* **2021,** *10* (6).
6. Danso, O. P.; Asante-Badu, B.; Zhang, Z.; Song, J.; Wang, Z.; Yin, X.; Zhu, R. Selenium Biofortification: Strategies, Progress and Challenges. *Agriculture-Basel* **2023,** *13* (2).
7. White, P. J.; Broadley, M. R. Biofortification of crops with seven mineral elements often lacking in human diets - iron, zinc, copper, calcium, magnesium, selenium and iodine. *New Phytologist* **2009,** *182* (1), 49-84.
8. Li, Y.; Xiao, Y.; Hao, J.; Fan, S.; Dong, R.; Zeng, H.; Liu, C.; Han, Y. Effects of selenate and selenite on selenium accumulation and speciation in lettuce. *Plant Physiology and Biochemistry* **2022,** *192*, 162-171.
9. Di, X.; Qin, X.; Zhao, L.; Liang, X.; Xu, Y.; Sun, Y.; Huang, Q. Selenium distribution, translocation and speciation in wheat (Triticum aestivum L.) after foliar spraying selenite and selenate. *Food Chemistry* **2023,** *400*.
10. Antoshkina, M.; Golubkina, N.; Poluboyarinov, P.; Skrypnik, L.; Sekara, A.; Tallarita, A.; Caruso, G. Effect of sodium selenate and selenocystine on Savoy cabbage yield, morphological and biochemical characteristics under Chlorella supply. *Plants* **2023,** *12* (5), 1020.
11. Luo, L.; Zhang, J.; Zhang, K.; Wen, Q.; Ming, K.; Xiong, H.; Ning, F. Peanut selenium

distribution, concentration, speciation, and effects on proteins after exogenous selenium biofortification. *Food Chemistry* **2021,** *354*.

12. Liu, Y.; Huang, S.; Jiang, Z.; Wang, Y.; Zhang, Z. Selenium Biofortification Modulates Plant Growth, Microelement and Heavy Metal Concentrations, Selenium Uptake, and Accumulation in Black-Grained Wheat. *Frontiers in Plant Science* **2021,** *12*.
13. de Lima, A. B.; Vilalta, T. d. A.; Lessa, J. H. d. L.; Lopes, G.; Guilherme, L. R. G.; Guerra, M. B. B. Selenium bioaccessibility in rice grains biofortified via soil or foliar application of inorganic Se. *Journal of Food Composition and Analysis* **2023,** *124*.
14. Xia, Q.; Yang, Z.; Shui, Y.; Liu, X.; Chen, J.; Khan, S.; Wang, J.; Gao, Z. Methods of Selenium Application Differentially Modulate Plant Growth, Selenium Accumulation and Speciation, Protein, Anthocyanins and Concentrations of Mineral Elements in Purple-Grained Wheat. *Frontiers in Plant Science* **2020,** *11*.
15. Liu, P.; Song, L.; Hao, S.; Qin, J.; Yang, C.; Yang, W.; Feng, M.; Zhang, M.; Wang, C.; Song, X. Effects of selenium application concentration, period and method on the selenium content and grain yield of Tartary buckwheat of different varieties. *Journal of the Science of Food and Agriculture* **2022,** *102* (15), 6868-6876.
16. Li, X.; Sun, J.; Li, W.; Gong, Z.; Jia, C.; Li, P. Effect of foliar application of the selenium-rich nutrient solution on the selenium accumulation in grains of Foxtail millet (Zhangzagu 10). *Environmental Science and Pollution Research* **2022,** *29* (4), 5569-5576.
17. Wang, Q.; Yu, Y.; Li, J.; Wang, Y.; Huang, Q.; Guo, Y.; Li, H. Effects of Different Forms of Selenium Fertilizers on Se Accumulation, Distribution, and Residual Effect in Winter Wheat-Summer Maize Rotation System. *Journal of Agricultural and Food Chemistry* **2017,** *65* (6), 1116-1123.
18. Borowska, K.; Koper, J.; Milanowski, M. SEASONAL CHANGES OF SELENIUM AND SELECTED OXIDOREDUCTASES IN SOIL UNDER DIFFERENT FERTILIZATION AND CROP ROTATION. *Ecological Chemistry and Engineering a-Chemia I Inzynieria Ekologiczna A* **2012,** *19* (7), 719-730.
19. Borowska, K.; Koper, J. The effect of long-term organic-mineral fertilisation on selenium content and chosen oxidoreductases activity under winter wheat cultivation. *Chem. Ecol.* **2010,** *26*, 111-116.
20. Tang, W.; Tang, W.; Xie, Y.; Li, X.; Li, H.; Lin, L.; Huang, Z.; Sun, B.; Sun, G.; Tu, L.; Tang, Y. Effects of intercropping on Se accumulation and growth of pakchoi, lettuce and radish. *International Journal of Phytoremediation* **2023,** *25* (9), 1165-1172.
21. Pan, S.; Lu, R.; Li, H.; Lin, L.; Li, L.; Xiang, J.; Chen, L.; Tang, Y. Mutual intercropping affects selenium uptake of eggplant seedlings. *Int. J. Environ. Anal. Chem.* **2021,** *101* (15), 2866-2875.
22. Lin, L.; Xu, X.; Wang, J.; Wang, X.; Lv, X.; Tang, Y.; Deng, H.; Liang, D.; Xia, H. Intercropping of Cyphomandra betacea with Different Ploidies of Solanum Sect. Solanum (Solanaceae) Wild Vegetables Increase Their Selenium Uptakes. *Plants* **2023,** *12* (4), 716.
23. Ragalyi, P.; Takacs, T.; Fuzy, A.; Uzinger, N.; Dobosy, P.; Zaray, G.; Szucs-Vasarhelyi, N.; Rekasi, M. Effect of Se-Enriched Irrigation Water and Soil Texture on Biomass Production and Elemental Composition of Green Pea and Carrot and Their Contribution to Human Se Intake. *Agriculture-Basel* **2022,** *12* (4).
24. Mrstina, T.; Praus, L.; Kaplan, L.; Szakova, J.; Tlustos, P. Efficiency of selenium

biofortification of spring wheat: the role of soil properties and organic matter amendment. *Plant Soil and Environment* **2022,** *68* (12), 572-579.

25. Ozpinar, S. Nutrient concentration and yield of maize (Zea mays L.) after vetch (Vicia sativa L.) in conventional and reduced tillage systems. *Journal of Plant Nutrition* **2016,** *39* (12), 1697-1712.
26. Bañuelos, G. S.; Centofanti, T.; Zambrano, M. C.; Vang, K.; Lone, T. A. Salsola soda as selenium biofortification crop under high saline and boron growing conditions. *Frontiers in Plant Science* **2022,** *13*, 996502.
27. Vega-Ravello, R.; Belen Romero-Poma, M.; de Oliveira, C.; Guimaraes Guilherme, L. R.; Lopes, G. Soil Selenium Addition for Producing Se-Rich Quinoa and Alleviating Water Deficit on the Peruvian Coast. *J. Soil Sci. Plant Nutr.* **2023,** *23* (1), 238-250.
28. Zhao, F.-J.; Lopez-Bellido, F. J.; Gray, C. W.; Whalley, W. R.; Clark, L. J.; McGrath, S. P. Effects of soil compaction and irrigation on the concentrations of selenium and arsenic in wheat grains. *Science of the Total Environment* **2007,** *372* (2-3), 433-439.
29. Marfetan, J. A.; Gallo, A. L.; Farias, M. E.; Velez, M. L.; Pescuma, M.; Ordonez, O. F. Exiguobacteriumsp. as a bioinoculant for plant-growth promotion and Selenium biofortification strategies in horticultural plants. *World J. Microbiol. Biotechnol.* **2023,** *39* (5).
30. Feng, Z.; Sun, H.; Qin, Y.; Zhou, Y.; Zhu, H.; Yao, Q. A synthetic community of siderophore-producing bacteria increases soil selenium bioavailability and plant uptake through regulation of the soil microbiome. *Science of the Total Environment* **2023,** *871*.
31. Dhiman, K.; Sharma, D.; Kumari, R.; Tomar, P. Biofortification of crops using microbes - a promising sustainable agriculture strategy. *Journal of Plant Nutrition* **2022**.
32. Seleiman, M. F.; Hafez, E. M. Optimizing inputs management for sustainable agricultural development. *Mitigating environmental stresses for agricultural sustainability in Egypt* **2021**, 487-507.
33. Wang, R.; Yang, J.; Fang, Z.; Zhang, S.; Zhou, X. Effects of Water Management on Selenium Accumulation in Rice Grains and Bacterial Community Diversity in Rhizosphere Soil. *Acta Pedologica Sinica* **2021,** *58* (6), 1574-1584.
34. Brooker, R. W.; Maestre, F. T.; Callaway, R. M.; Lortie, C. L.; Cavieres, L. A.; Kunstler, G.; Liancourt, P.; Tielboerger, K.; Travis, J. M. J.; Anthelme, F.; Armas, C.; Coll, L.; Corcket, E.; Delzon, S.; Forey, E.; Kikvidze, Z.; Olofsson, J.; Pugnaire, F. I.; Quiroz, C. L.; Saccone, P.; Schiffers, K.; Seifan, M.; Touzard, B.; Michalet, R. Facilitation in plant communities: the past, the present, and the future. *Journal of Ecology* **2008,** *96* (1), 18-34.
35. He, Q.; Bertness, M. D.; Altieri, A. H. Global shifts towards positive species interactions with increasing environmental stress. *Ecology Letters* **2013,** *16* (5), 695-706.
36. El-Shamy, M. A.; Seleiman, M.; Rady, T. E.-G. H. Effect of different sowing methods on growth, yield and its components of wheat under intercropping patterns with Egyptian clover var. *Fahl. Assiut J. Agric. Sci.,(48) No.(3)* **2017**.
37. Feng, R.; Wei, C.; Tu, S. The roles of selenium in protecting plants against abiotic stresses. *Environmental and Experimental Botany* **2013,** *87*, 58-68.
38. America, S. S. S. o. In *Glossary of soil science terms*, Soil Science Society of America: 1997.
39. Nawaz, M. F.; Bourrie, G.; Trolard, F. Soil compaction impact and modelling. A review. *Agronomy for Sustainable Development* **2013,** *33* (2), 291-309.
40. Kooistra, M. J.; Schoonderbeek, D.; Boone, F. R.; Veen, B. W.; Vannoordwijk, M. ROOT-

SOIL CONTACT OF MAIZE, AS MEASURED BY A THIN-SECTION TECHNIQUE .2. EFFECTS OF SOIL COMPACTION. *Plant and Soil* **1992,** *139* (1), 119-129.

41. Arvidsson, J. Nutrient uptake and growth of barley as affected by soil compaction. *Plant and Soil* **1999,** *208* (1), 9-19.
42. Kausch, M. F.; Pallud, C. E. Modeling the impact of soil aggregate size on selenium immobilization. *Biogeosciences* **2013,** *10* (3), 1323-1336.
43. Roy, R.; Nunez-Delgado, A.; Sultana, S.; Wang, J.; Munir, A.; Battaglia, M. L.; Sarker, T.; Seleiman, M. F.; Barmon, M.; Zhang, R. Additions of optimum water, spent mushroom compost and wood biochar to improve the growth performance of Althaea rosea in drought-prone coal-mined spoils. *Journal of Environmental Management* **2021,** *295*.
44. Alvarez, R.; Steinbach, H. S. A review of the effects of tillage systems on some soil physical properties, water content, nitrate availability and crops yield in the Argentine Pampas. *Soil Tillage Res.* **2009,** *104* (1), 1-15.
45. Cooper, J.; Baranski, M.; Stewart, G.; Nobel-de Lange, M.; Barberi, P.; Fliessbach, A.; Peigne, J.; Berner, A.; Brock, C.; Casagrande, M.; Crowley, O.; David, C.; De Vliegher, A.; Doering, T. F.; Dupont, A.; Entz, M.; Grosse, M.; Haase, T.; Halde, C.; Hammerl, V.; Huiting, H.; Leithold, G.; Messmer, M.; Schloter, M.; Sukkel, W.; van der Heijden, M. G. A.; Willekens, K.; Wittwer, R.; Mader, P. Shallow non-inversion tillage in organic farming maintains crop yields and increases soil C stocks: a meta-analysis. *Agronomy for Sustainable Development* **2016,** *36* (1).
46. Torabian, S.; Farhangi-Abriz, S.; Denton, M. D. Do tillage systems influence nitrogen fixation in legumes? A review. *Soil Tillage Res.* **2019,** *185*, 113-121.
47. Lessa, J. H. L.; Araujo, A. M.; Silva, G. N. T.; Guilherme, L. R. G.; Lopes, G. Adsorption-desorption reactions of selenium (VI) in tropical cultivated and uncultivated soils under Cerrado biome. *Chemosphere* **2016,** *164*, 271-277.
48. Lopez-Bellido, F. J.; Sanchez, V.; Rivas, I.; Lopez-Bellido, R. J.; Lopez-Bellido, L. Wheat grain selenium content as affected by year and tillage system in a rainfed Mediterranean Vertisol. *Field Crops Research* **2019,** *233*, 41-48.
49. Hamza, M. A.; Anderson, W. K. Soil compaction in cropping systems - A review of the nature, causes and possible solutions. *Soil Tillage Res.* **2005,** *82* (2), 121-145.
50. Quang Toan, D.; Wang, M.; Thi Anh Thu, T.; Zhou, F.; Wang, D.; Zhai, H.; Peng, Q.; Xue, M.; Du, Z.; Banuelos, G. S.; Lin, Z.-Q.; Liang, D. Bioavailability of selenium in soil-plant system and a regulatory approach. *Critical Reviews in Environmental Science and Technology* **2019,** *49* (6), 443-517.
51. Eiche, E.; Nothstein, A. K.; Goettlicher, J.; Steininger, R.; Dhillon, K. S.; Neumann, T. The behaviour of irrigation induced Se in the groundwater-soil-plant system in Punjab, India. *Environmental Science-Processes & Impacts* **2019,** *21* (6), 957-969.
52. Eid, M. A.; Abdel-Salam, A. A.; Salem, H. M.; Mahrous, S. E.; Seleiman, M. F.; Alsadon, A. A.; Solieman, T. H.; Ibrahim, A. A. Interaction effects of nitrogen source and irrigation regime on tuber quality, yield, and water Use efficiency of Solanum tuberosum L. *Plants* **2020,** *9* (1), 110.