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Review Article

A Review on Wheat Management, Strategies, Current Problems and Future Perspectives

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Abstract

Wheat, also known as *Triticum Aestivum* that is the predominant ingredient in the human diet. Weed indirectly affects the production of wheat, harboring the crop by challenging the crop for large pests, management of water intervention, reduction of grain input and efficiency, and rising processing costs. The faster growth in a thick, enclosed canopy is facilitated by a canopy, the general mechanism for improving cereal crop competition over weed species. Crop geometry is an old discipline in agriculture. It is referring to the plant's spatial arrangement and specifies the layout of the population of crops. Without concurrent grain yield loss, non-uniform geometry, such as seedling tossing, is aimed at minimizing labor intensity. Chemical and hand weeding has also been used in wheat as a weed control method. Herbicide incorporation and hand weeding greatly reduced the dry weight of weeds relative to dry weight in untreated parcels. Crop tailoring is typically calculated in three ways as a function of competition: tillering output rate, final tillering number, and tillering economy. Additional studies will help to explain the essence of the relationships of characteristics and skills in locations and seasons.

Keywords: Wheat, management, crop, agronomy, agriculture, herbicides, weeds.

INTRODUCTION

Wheat, also known as Triticum Aestivum L. is the predominant ingredient in the human diet. In the Australian agriculture market, more wheat output accounts for more than 13 million ha of ground, with more than AU$ 6.9 billion in gross value, weed contain a strong effect in the production of wheat patterns, like labor, supplies, drugs, and expenditures, yields from executives. Weed indirectly affects the production of wheat, harboring the crop by challenging the crop for large pests, management of water intervention, reduction of grain input and efficiency, and rising processing costs. While averages can differ across places and seasons, bibliography a simple message across the world tells about the expense of weed. A lot of money goes into agriculture, and this is ultimately reflected in food prices. Without appropriate practices for monitoring the loss of yield due to weeds in wheat can overshadow pests (arthropods, nematodes, mice, birds, baby slugs And snails), viruses, and pathogens [1, 2].

As part of an integrated weed management program, the writers vividly supported the adoption of greater rates of wheat seed. Via reduced row distancing, improved crop competition could be achieved as well. Long-term analysis conducted in Western that narrow row was developed by Australia Spacing decreases L. Generation of rigidum seeds in some different species of crops, including maize, barley, Pisum sativum L., and (Cicer arietinum L.). Besides, at small row spacing, crop yield was consistently increased [3-5].

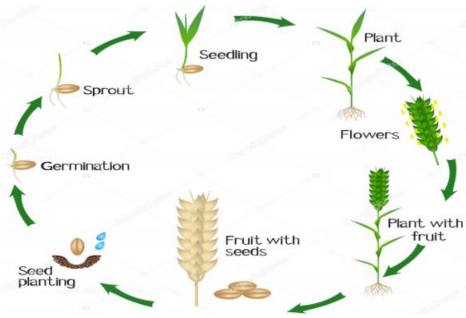

Fig-1: Shows the wheat cycle and changes during development

Over the past two decades, the concept of creating a rating system for the competitiveness of crops has been around. Ideally, screening tests that estimates the competitive potential of cultivars will be on the basis of an easy and fast evaluation in a set of acceptable characteristics. Such crop grading can include guidelines for farmers to use when making decisions based on management. To get an exact measure of suppressive capability, it proves be more realistic than recent methods, where cultivators will take several decades of testing on various conditions. Farmers who wish to choose a challenging variety often finds out that challenging capacity knowledge has a limit or basis on a subjective perception [6, 7].

Strategies for Planting

The faster growth in a thick, enclosed canopy is facilitated by a canopy, the general mechanism for improving cereal crop competition over weed species. In essence, this includes using one or a combination of techniques to control the increasing distance among crop plants, including higher seeding rates (density in planting), little row spacing, orientation of row, and sewing mechanism. The main objective is to promote greater interception of light by cropping plants, quantity available in weed is severely restricted, and therefore, weed production, its growth, and development of seed are suppressed [8-10].

Planting Density

Substantial suppressing L. rigidum rose from 40 or 75 to 200 plants m-2 when wheat planting density gets raised. A new sewed multiple wheat producers in the same area of Australia at a level of the seeding of weed rates, concluding in crop densities ranging from 40 to 300 plants m-2; when they are compared to the local suggested sewing density of 100e150 plants m-2. The suppression in L includes wheat density of at least 100 m-2 plants. Stiffness and for achieving a modest rise in crop yield. This was valid in a wide range of environments for all wheat cultivars (seasonal precipitation among 100 and 320 mm) and weed density [11].

Fig-2: Shows the strategies for wheat management

Among of the most matching large-scale weed management goals in conservation agriculture systems are cultural weed management objectives, especially improving crop compete within the cultivation of highly competitive weed producers, growing rates of crop seed, using little row distancing and latest canopy architecture. For example, the appropriate suppression of Lolium rigidum Gaud resulted in an increased wheat density from the suggested 200 plants/m2 to 300 plants/m2 within Australia's southern wheat belt. The faster canopy closing and limiting of weed growth space is the main procedure of using enhanced crop productivity against weeds. The inclusion of methods of cultural weed monitoring in integrated weed management (IWM) strategies can be minimized over-reliance on drugs methods in systems for the development of wheat conservation [12-15].

Crop geometry is an old discipline in agriculture. It is referring to the plant's spatial arrangement and specifies the layout of the population of crops. Without concurrent grain yield loss, non-uniform geometry, such as seedling tossing, is aimed at minimizing labor intensity. In comparison, uniform geometry, such as single, twin, or skip row configurations, is widely used in large-scale crop production (e.g. maize, sorghum, peanuts, soybeans, wheat, and rice). If there is successful weed control, such techniques can show marked effects on grain yield. A consistent influence of row configuration is seen in low pillar crops such as maize and sorghum. Plants arranged in rows with narrow spacing can achieve canopy closure early under favorable conditions and optimize both light interception and productivity while reducing weed occurrence [16, 17].

Broad row spacing improves intra-row rivalry in dry land production systems while providing additional resources in between rows. In the life cycle of a plant, early intra-row competition restricts the supply of water and nutrients to the plant, thereby suppressing vegetative growth and delaying access to inter-row water and nutrient reserves until reproductive growth. In contrast, due to their good tailoring capacity, high-tailoring crops such as wheat have a more complicated response to both inter and intra-row spacing changes. Narrow row spacing in fertile environments can cause mutual shading earlier than broad row spacing, thereby limiting excess tailoring [18-20]. This advancement includes a lack of carbohydrates, morphogenetic shade-avoidance reaction, and variations in the strength of blue, red, and far-red radiation. While tailoring has excellent self-regulation and effective artificial control by row spacing exists, the effect of row configuration is more uncertain on high-tailoring crops [21].

Moreover, there is substantial interest in the effectiveness of raised wheat. Competition on the growth and production of weed in Australia's crop systems, results in rising wheat plant productions over typical densities used in commercials (~110 plant m-2).

The introduction to tactics targeted at catching as well as killing seeds of weed in harvesting operations is a recent and widespread shift in crop production practices in Australia. The effectiveness of these HWSC activities can be significantly influenced by the architecture and the seed retention rate of the targeted species of weed being known as harvest weed seed control (HWSC). Improved competition for wheat crops can result in changes in weed growth habits. Improving competition for wheat crops can lead to changes in the growth habit of weeds that potentially increase their susceptibility to the control of harvesting weed seeds [22].

Recent research has established that L. In the canopy of wheat crops with higher production of biomass, rigidum seed was maintained higher compared to those with lower production of biomass. A great number of annual weeds, including L. Rigidum, to intercept more light, are shade intolerant and their morphological response in stem elongation. This reaction is likely to result in a higher ratio of seed retention in the canopies of more successful crops of wheat. A significant management factor for improving wheat yield is considered to be the optimum seeding rate. It is of particular importance in the production of wheat since it is in most cropping systems under the control of the farmer [23-25].

Optimum densities of plants differ greatly between regions, climate, soil, sowing time, and varieties. Yield reductions frequently take place if optimum seeding rates are exceeded. Previous research indicates that biological yield has been substantially influenced by seeding rates, stands achieved, spike quantity, and weighing. Higher rates of seeding pays for decreased tiller growth as well as encourage more beneficial main stem spikes, especially for cultivars that tend to produce fewer tillers [26-28]. There is a close association between stands and components of output. Therefore the goals of this study were to evaluate how different seed rates can change yield and to understand the better interactive impact of seed rates and varieties to provide f with better alternative management practices. Therefore this study aimed to establish how different rates of seeds can alter outputs and to better learn the catchy impact on rates of seeds and varieties to give farmers facing low grain yield problems with better alternative management practices [29, 30].

Chemical and hand weeding has also been used in wheat as a weed control method. Herbicide incorporation and hand weeding greatly reduced the dry weight of weeds relative to dry weight in untreated parcels. In achieving a greater grain yield than hand weeding, chemical weed control in wheat was best. The use of grassy and wide leaf herbicides improved the production and yield of grain components. Generally speaking, herbicides are effective; wild oat spreads widely and yields continue to be reduced. For wild oat control in many fields, herbicide selection and timing are important. Quality losses due to contamination of wild oat cereal samples can be significant, resulting in seed and milling rejection [31, 32].

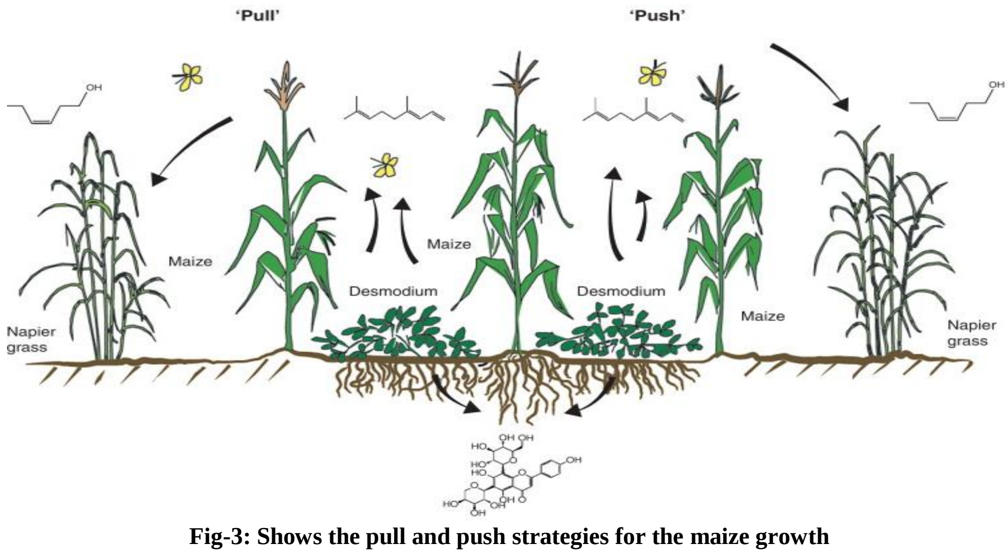

Fig-3: Shows the pull and push strategies for the maize growth

Crop tailoring is typically calculated in three ways as a function of competition: tillering output rate, final tillering number, and tillering economy (percentage of surviving tiller). Morphologically, plastic and density depend on the rate of tillering output and final tillering number; tillering numbers decreased with increased integration and intraspecific competition. In wheat, barley, and oats, this has been demonstrated and can differ between cultivars. This represents the development of fertile heads and, subsequently, the reduction in yield in weedy scenarios. Therefore if tillering loss is not taken into account, tillering counts and tailoring rate from each plant can give misleading results as a characteristic of crop-weed interactions [33-35].

CONCLUSION

The main difference in competition has been shown by several studies' capability among cultivars. Traits have been identified that lead to increased suppressive capacity, although the significance of these characteristics can differ between years. Additional studies will help to explain the essence of the relationships of characteristics and skills in locations and seasons. Farmers will benefit most from robust screaning tests that ranks producers in a method similar to the ranking for disease end. As part of an integrated weed control plan, best suggestion on how to use competitive producers will give growers more faith in the implementation of this approach.

REFERENCES

1. Shahid, A., Ali, S., Zahra, T., Raza, M., Shahid, A., Saeed, M. U., & Javaid, F. Influence of Microbes in Progression of Cancer and DNA Damaging Effects.
2. Iftikhar, A., Shahid, A., Shah, S. S., Ali, S., Raza, M., Ali, E., & Umbreen, S. Antimicrobial Activities of Selected Medicinal Plant with Potential Role of Chemical Compounds.
3. Qamar, M., Mustafa, G. A., Tariq, S., Rafeeq, H., Rafiq, M., Naqvi, W. Z., ... & Kanwal, T. Novel Methods for Detection of Biological Samples, Current Direction and Future Perspectives.
4. Naeem, M., Hayat, M., Qamar, S. A., Mehmood, T., Munir, A., Ahmad, G., ... & Hussain, A. (2019). Risk factors, genetic mutations and prevention of breast cancer. Int. J. Biosci, 14(4), 492-496.
5. Shafiq, S., Adeel, M., Raza, H., Iqbal, R., Ahmad, Z., Naeem, M., ... & Azmi, U. R. (2019). Effects of Foliar Application of Selenium in Maize (Zea Mays L.) under Cadmium Toxicity. In Biological Forum-An International Journal (Vol. 11, No. 2, pp. 27-37).
6. Ahmad, I., Khan, S., Naeem, M., Hayat, M., Azmi, U. R., Ahmed, S., ... & Irfan, M. (2019). Molecular Identification of Ten Palm Species using DNA Fingerprinting. Int. J. Pure App. Biosci, 7(1), 46-51.
7. Usman, G., Muhammad, N., Hamza, R., Usman, I., Ayesha, A., Saqib, U., ... & Fatima, Q. (2019). A Novel Approach towards Nutraceuticals and Biomedical Applications. Scholars International Journal of Biochemistry, 2(10), 245-252.
8. Tahir, M. F., Ali, S., Noman, M., & Goher, M. A Novel Approach towards the Potential Effects of Chlorpyrifos on Testicular Biochemistry and Physiology of Male Sprague Dawely Rats.
9. Adom, K. K., Sorrells, M. E., & Liu, R. H. (2003). Phytochemical profiles and antioxidant activity of wheat varieties. Journal of agricultural and food chemistry, 51(26), 7825-7834.
10. Maeoka, R. E., Sadras, V. O., Ciampitti, I. A., Diaz, D. R., Fritz, A. K., & Lollato, R. P. (2020). Changes in the Phenotype of Winter Wheat Varieties Released Between 1920 and 2016 in Response to In-Furrow Fertilizer: Biomass Allocation, Yield, and Grain Protein Concentration. Frontiers in plant science, 10, 1786.
11. Kumar, R., & Khatkar, B. S. (2017). Thermal, pasting and morphological properties of starch granules of wheat (Triticum aestivum L.) varieties. Journal of food science and technology, 54(8), 2403-2410.
12. Chen, Z., Wang, P., Weng, Y., Ma, Y., Gu, Z., & Yang, R. (2017). Comparison of phenolic profiles, antioxidant capacity and relevant enzyme activity of different Chinese wheat varieties during germination. Food Bioscience, 20, 159-167.
13. Wang, S. X., Zhu, Y. L., Zhang, D. X., Shao, H., Liu, P., Hu, J. B., ... & Xia, X. C. (2017). Genome-wide association study for grain yield and related traits in elite wheat varieties and advanced lines using SNP markers. PloS one, 12(11), e0188662.
14. Naeem, M., Ali, J., Hassan, M. Z., Arshad, B., Rao, M. H. I., Sarmad, M. S. K., ... & Hassan, M. U. (2019). Novel Approach towards DNA Barcoding as a Tool in Molecular Biologyand Biological Activities of Cyclotides with Particular Emphasizes at Molecular Level. In Biological Forum-An International Journal, 11(2), 83-96.
15. Ibrahim, A. (2018). Monitoring some quality attributes of different wheat varieties by infrared technology. Agricultural Engineering International: CIGR Journal, 20(1), 201-210.
16. Shabi, T. H., Islam, A. M., Hasan, A. K., Juraim, A. S., & Anwar, M. P. (2018). Differential weed suppression ability in selected wheat varieties of Bangladesh. Acta Scientifica Malaysia (ASM), 2(2), 1-7.
17. Carranza-Gallego, G., Guzman, G. I., García-Ruíz, R., de Molina, M. G., & Aguilera, E. (2018). Contribution of old wheat varieties to climate change mitigation under contrasting managements and rainfed Mediterranean conditions. Journal of Cleaner Production, 195, 111-121.
18. Naeem, A., Saddique, S., & Chand, S. A. (2019). Advancement and Future Directions towards Herbal Treatment for Various Diseases.
19. Naeem, M., Ashraf, A., Safdar, H. M. Z., Khan, M. Q., Rehman, S. U., Iqbal, R., ... & Ahmad, G. Biochemical changes in patients with chronic kidney failure in relation to complete blood count and anemia.
20. Subedi, S., Ghimire, Y. N., Adhikari, S. P., Devkota, D., Shrestha, J., Poudel, H. K., & Sapkota, B. K. (2019). Adoption of certain improved varieties of wheat (Triticum aestivum L.) in seven different provinces of Nepal. Archives of Agriculture and Environmental Science, 4(4), 404-409.
21. Mefleh, M., Conte, P., Fadda, C., Giunta, F., Piga, A., Hassoun, G., & Motzo, R. (2019). From ancient to old and modern durum wheat varieties: Interaction among cultivar traits, management, and

technological quality. Journal of the Science of Food and Agriculture, 99(5), 2059-2067.

22. Katyal, M., Singh, N., Chopra, N., & Kaur, A. (2019). Hard, medium-hard and extraordinarily soft wheat varieties: Comparison and relationship between various starch properties. International journal of biological macromolecules, 123, 1143-1149.
23. Naeem, M., Hussain, A., Azmi, U. R., Maqsood, S., Imtiaz, U., Ali, H., ... & Ghani, U. (2019). Comparative Anatomical Studies of Epidermis with Different Stomatal Patterns in Some Selected Plants Using Compound Light Microscopy. International Journal of Scientific and Research Publications, 9(10), 375-380.
24. Ahsan, M., Aslam, M., Akhtar, M. A., Azmi, U. R., Naeem, M., Murtaza, G., ... & Shafiq, S. (2019). Effect of inoculation of three rhizobial strains on maize hybrids. Journal of Biodiversity and Environmental Sciences, 14(6), 168-177.
25. Abu Hazafa, Ammara Batool, Saeed Ahmad, Muhammad Amjad, Sundas Nasir Chaudhry, Jamal Asad, Hasham Feroz Ghuman, Hafiza Madeeha Khan, Muhammad Naeem, Usman Ghani, Humanin: A mitochondrial-derived peptide in the treatment of apoptosis-related diseases, Life Sciences, Volume 264, 2021, 118679.
26. Khan, S., Abbas, A., Ali, I., Arshad, R., Tareen, M. B. K., & Shah, M. I. (2019). Prevalence of overweight and obesity and lifestyle assessment among school–going children of Multan, Pakistan.
27. Rafeeq, H., Ahmad, S., Tareen, M. B. K., Shahzad, K. A., Bashir, A., Jabeen, R., ... & Shehzadi, I. Biochemistry of Fat Soluble Vitamins, Sources, Biochemical Functions and Toxicity. Haya: The Saudi Journal of Life Sciences
28. Khan, S., Zelle Rubab, S. H., Abbas, A., Arshad, R., & Tareen, M. B. K. Hematological profile of children with severe acute malnutrition at the Tertiary care hospital in Multan.
29. Shahid, A., Ali, S., Zahra, T., Raza, M., Shahid, A., Saeed, M. U., & Javaid, F. 2020. Influence of Microbes in Progression of Cancer and DNA Damaging Effects. Haya: The Saudi Journal of Life Sciences
30. Iftikhar, A., Shahid, A., Shah, S. S., Ali, S., Raza, M., Ali, E., & Umbreen, S. Antimicrobial Activities of Selected Medicinal Plant with Potential Role of Chemical Compounds. Haya: The Saudi Journal of Life Sciences
31. Iqra, L., Rashid, M. S., Ali, Q., Latif, I., & Mailk, A. (2020). Evaluation for Na+/K+ ratio under salt stress condition in wheat. Life Sci J, 17(7), 43-47.
32. Maeoka, R. E., Sadras, V. O., Ciampitti, I. A., Diaz, D. R., Fritz, A. K., & Lollato, R. P. (2020). Changes in the Phenotype of Winter Wheat Varieties Released Between 1920 and 2016 in Response to In-Furrow Fertilizer: Biomass Allocation, Yield, and Grain Protein Concentration. Frontiers in plant science, 10, 1786.
33. Valente, J., Gerin, F., Le Gouis, J., Moënne‐Loccoz, Y., & Prigent–Combaret, C. (2020). Ancient wheat varieties have a higher ability to interact with plant growth‐ promoting rhizobacteria. Plant, Cell & Environment, 43(1), 246-260.
34. Pontonio, E., Dingeo, C., Di Cagno, R., Blandino, M., Gobbetti, M., & Rizzello, C. G. (2020). Brans from hull-less barley, emmer and pigmented wheat varieties: From by-products to bread nutritional improvers using selected lactic acid bacteria and xylanase. International journal of food microbiology, 313, 108384.
35. Suchowilska, E., Wiwart, M., Krska, R., & Kandler, W. (2020). Do Triticum aestivum L. and Triticum spelta L. Hybrids Constitute a Promising Source Material for Quality Breeding of New Wheat Varieties?. Agronomy, 10(1), 43.