



INFLUENCE OF IRON FOLIAR FEEDING ON SOME GROWTH AND PHYSIOLOGICAL PARAMETERS OF WHEAT

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Article history:	Abstract:
Received: 6 th April 2024 Accepted: 4 th May 2024	Micronutrients consist of six essential elements: iron (Fe), manganese (Mn), zinc (Zn), copper (Cu), boron (B) and molybdenum (Mo). These elements present in very small amounts in both soils and plants, but their role is regularly as important as the primary or secondary nutrients. They are playing an important function in growth and development of plant. Foliar fertilization of micronutrients is one of the most important methods of fertilizer application in agriculture practices in order to increase Fe concentration in grain since foliar nutrients help easy and fast consumption of nutrients by penetrating the stomata or leaf cuticle and enter the cells. Foliar application of iron, either single or along with other micronutrients can help achieve favorable results on growth parameters, yield components and yield quality of wheat crop. It is evident that foliar and soil application of Fe deficient soils enhance plant growth, yield quantity and quality, yield components and grain Fe concentration. The available literature on biofortification of wheat with Fe through foliar and soil application of Fe fertilizers on the growth parameters, yield components yield quantity and quality of wheat are reviewed and presented below.

Keywords: Iron, ultra-disper, powder, suspension (TUD), growth, morphological and physiological parameters, Triticum drum.

INTRODUCTION

Fe plays major role in many plant functions this function includes respiration, photosynthesis processes, chlorophyll development, energy transfer within the plant, a component of at enzymes and proteins, and involved in nitrogen fixation. (1) Fe, Zn, B, Cu and Mo are known to be the most important micronutrients for higher plants. (2) Liew has reported that there is a significant enhance in crop production due to application of micronutrients (3) Different methods are used for micronutrient application such as seed priming, soil application and fortification, however foliar application is more beneficial. Rehm and Albert reported that foliar spray of ferrous sulphate for the correction of Fe-chlorosis in wheat was found better than soil application. Both macronutrients and micronutrients are foliar applied in combination with each other, then there is a significant increase in wheat production. (4) (5).Bameri reported that root growth in wheat was improved by spraying micronutrients which led to increase in uptake of macro and micronutrients. Moreover, there is an enhance in protein percentage of seed and yield components thanks to foliar application.(6)

MATERIALS AND METHODS

To find the effect of foliar application of micronutrients on yield components of wheat, an experiment was conducted at Southern Research Institute of Agriculture, Karshi district, Kashkadarya region during 2023. The experiment was laid out in systematic complete block design with three replication. The plot size was 15.0 m x 3.6 m. the fertilizers were applied NPK 180:90:60 kg/ha. All the P and K was applied at sowing time, while N was applied in three splits. The iron were applied three times, tillering, jointing and boots stage. All the other agronomic practices were kept uniform.

Treatments includes:

T₁ = no spray with NPK 180:90:60 kg/ha

T₂ = spraying plants with 6 % (TUD) tillering, jointing and heading

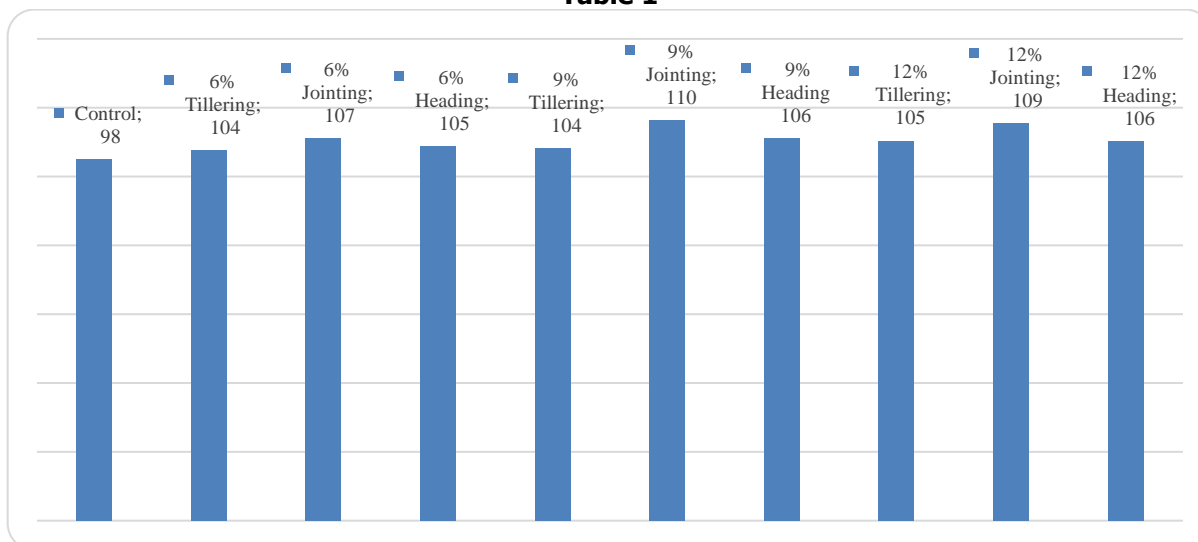
T₃ = spraying plants with 9 % (TUD) tillering, jointing and heading

T₄ = spraying plants with 12 % (TUD) tillering, jointing and heading

To collect the data from respected treatments, 1m² was systematic thrown at three different places and then averaged to count number of tillers. Whereas for plant height (cm), spikelets length (cm) and flag leaf chlorophyll content.

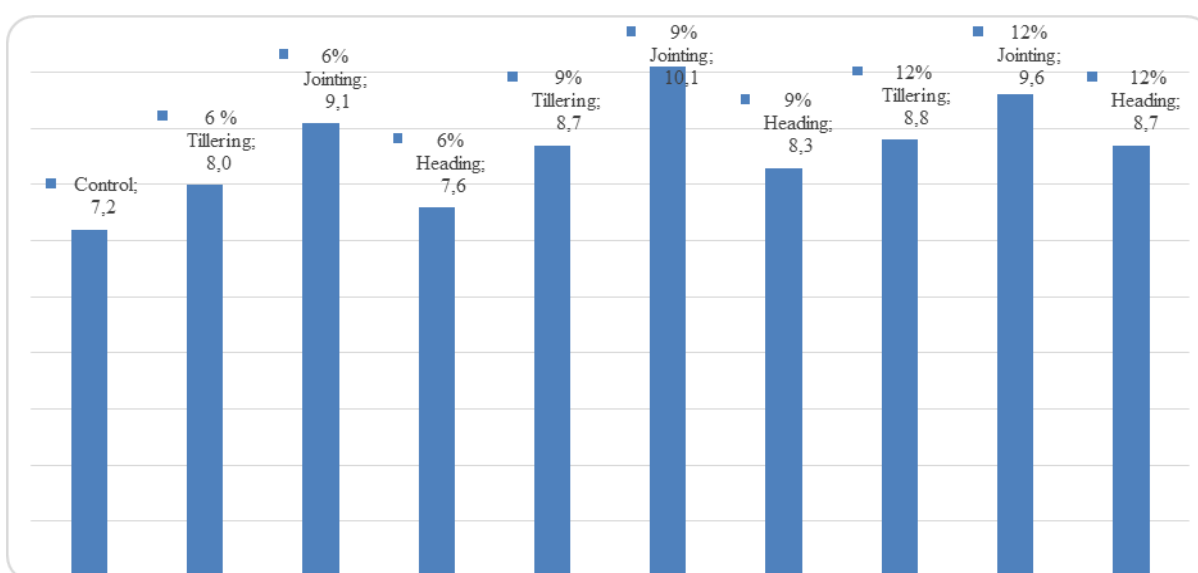
RESULTS AND DISCUSSION: Plant height (cm), The data presented in table 1 revealed that foliar application of TUD significantly increased the plant height. Plant height was increased by 9 cm with T₃ followed by 12 cm with T₆ and 11 cm with T₉ as compared with the control. The maximum plant height 110 cm was obtained from T₃ treatment TUD 9% +NPK jointing stage. The minimum plant height 98 cm was observed in T₁ treatment no spray.

Table 1



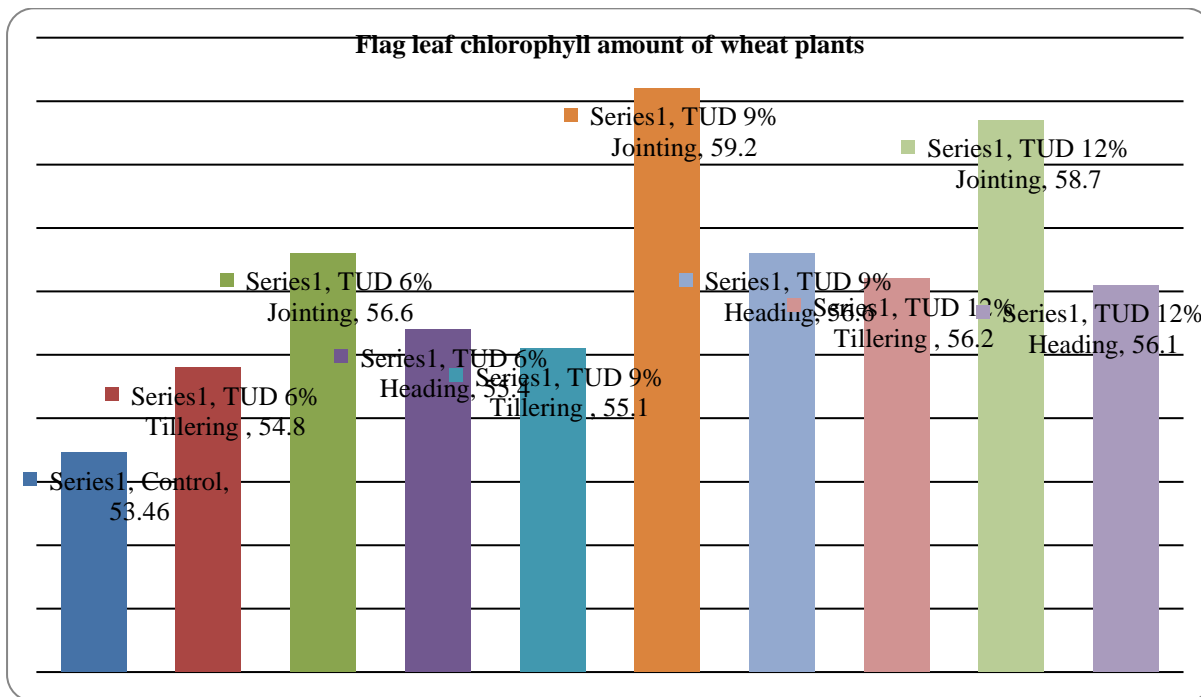
Spike length (cm). Spike length was meaningfully affected due to foliar application of TUD 9% (Table 2). Considerably, maximum spike length was observed in T₃ treatment TUD 9% +NPK jointing stage. Spike length was increased by 1.9 cm with T₃ followed by 3 cm with T₆ and 1.5 cm with T₉ as compared with the control. Minimum spike length 7.2 cm was detected in T₁ treatment no spray. Blevins and Lukaszewski reported that spike length may increase due to balanced availability of nutrients in the rhizosphere, their uptake and absorption by the plant.

Table 2



Flag leaf chlorophyll content: The effect of foliar spray with Fe on chlorophyll content (SPAD value) in the flag leaves of wheat plants. A considerably variation in flag leaf chlorophyll content easy observed in different treatments for foliar application of iron. The lowest flag leaf chlorophyll amount was obtained from control T₁. Compared with control, flag leaf chlorophyll amount was increased 3.14, 5.74 and 5.24 by treatments application of T₃, T₆ and T₉ respectively. Maximum flag leaf amount 59.2 were produced by T₆ treatment TUD 9% +NPK. jointing stage.

Table 3



CONCLUSION: Regarding to the above review of research papers it can be concluded that the application of iron fertilizers (soil and foliar) single or in mixture with other micronutrients has a positive effect on growth parameters, flag leaf area and flag leaf chlorophyll content, yield components, grain yield and grain Fe concentration in wheat.

It is addition very practical when plants are not able to absorb the iron from soil due to many soil physical and chemical properties such as soil texture, very high humidity, compaction, soil pH, calcium carbonate, organic matter content and accumulation of phosphorus. As a result, foliar application of Fe develops plant growth, flag leaf chlorophyll content and grain yield and its quality of wheat.

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