GROWTH AND YIELD OF WHEAT IN RESPONSE TO FOLIAR APPLICATION OF SOLUPLANT FERTILIZER

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ABSTRACT: *Foliage application can certification the openness of incorporate to crops for acquiring most elevated yield. To examination of development and yield of wheat in light of foliage utilization of soluplant compost a test was finished up at Agronomy Section, Agriculture Research Institute, Tando Jam amid season Rabi, 2014-15.The treatments consist of No Soluplant @ 0.00 kg ha^{-1} (control), Soluplant @ 1.25 kg ha^{-1}, Soluplant @ 2.50 kg ha^{-1}, Soluplant @ 3.75 kg ha^{-1}, Soluplant @ 5.00 kg ha^{-1}, Soluplant @ 6.25 kg ha^{-1}, and Soluplant @ 7.50 kg ha$^{-1.}$significant development was recorded in plant height(cm), number of grain spike-1,thousand grain weight (g), characteristic yield (kg ha-1) and grain yield (kg ha-1). The 6 and 7 use of treatment achieved most compelling plant height(cm), number of grain spike-1, thousand grain weight (g), characteristic yield (kg ha-1) and grain yield (kg ha-1). Most great grain yield was recorded for Soluplant @ 7.50 kg ha-1 which was quantifiably similar to that of Soluplant @ 6.25 kg ha-1.It was concluded that Soluplant @ 7.50 kg ha^{-1} of treatment at tillering stage along with the recommended doses of NPK helped in enhancing yield and yield components of wheat*.

INTRODUCTION

Wheat is the King of cereal crop in whole world. In Pakistan, wheat requirement is rising every year due to population expansion and stagnant yield per unit area [1]. Where the ideal seeding rate is viewed as a critical administration element for enhancing yield of wheat. The production of wheat crop can be improved by growing new high yielding assortments and selection of appropriate bundle of innovation [2]. In Pakistan the yield of wheat product is two and half times less down when contrasted with cutting edge wheat creating nations of the worldwidespanning up this crevice is a testing situation for researchers and agriculturists. Seed quality, saltiness, water logging, uncalled for and lacking utilization of composts, poor watering system administration, high information costs, low agriculturists training and no utilization of micronutrients and natural fertilizers these are fundamental causes for low production of wheat [3].The constrained water conditions diminish the uptake and translocation of supplements in this manner, the foliar application might be a substitute and compelling way to deal with enhance the supplements accessibility to plants. Foliarly connected NPK composts altogether contribute towards enhanced yield through expansion in biomass of the plants [4]. The macro and micronutrients is play the vital role in agriculture. Nitrogen (N), phosphorus (P) and potassium (K), boss key supplement, have significant significance in product support. Urea is a central element of proteins and thus all chemicals.The constructive outcome of foliar connected nitrogen (N), phosphorus (P), and potassium (K) to manage appropriate leaf nourishment and also carbon adjust, and enhancing photosynthetic limit is settled [5]. Foliar application of nutrients for increasing and exploiting genetic potential of the crop is considered as an efficient and economic method of supplementing the nutrient requirement. In spite of sufficient use of NPK manure, typical development of high yielding assortments couldn't be gotten because of next to zero utilization of micronutrients. High manure responsive assortments express their full yield potential when follow components are connected alongside NPK composts [6]. Foliar application of major and minor nutrients like NPK shall be more effective than soil application and also avoiding the depletion of these nutrients in leaves, in that way resulting in an increased photosynthetic rate, improved translocation of these nutrients from the leaves to the developing grains. Foliar application is qualified with the advantage of quick and professional utilization of nutrients, eliminating losses through leaching, and fixation and helps in regulating the uptake of nutrients by plants [7].

MATERIALS AND METHODS

A trial was directed at Agronomy Section, Agriculture Institute, Tando Jam amid season Rabi, 2014-15 to survey the accomplish of foliage encouraging of macronutrients on yield and yield parts of wheat. A Randomized Complete Block Design (RCBD) with three replications. The net plot size of was 6 m x 3 m (18 m2). Six fuse levels with one control plot (no fertilizer) were verifiable as variables underneath study. The medicines involved of No Soluplant @ 0.00 kg ha^{-1} (control), Soluplant @ 1.25 kg ha^{-1}, Soluplant @ 2.50 kg ha^{-1}, Soluplant @ 3.75 kg ha^{-1}, Soluplant @ 5.00 kg ha^{-1}, Soluplant @ 6.25 kg ha^{-1}, and Soluplant @ 7.50 kg ha^{-1}The wheat plant Benazir was sowing on a particularly arranged seed bed in second week of Nov in all season under scrutiny. All the (P) and (K) was important at the period of seed bed building up nearby ¼ estimations of (N). The remaining vague parts of (N) were beat superior to anything normal with initial three watering frameworks. The reason of N, P and K2O was urea (46%N), Single Super Phosphate (P2O5 18%) and Sulfate of potash (K2O 0%), independently. The harvest was sowing with a solitary column penetrating procedure keeping up line to line. The information were closed on propositions parameters of financial significance, for example, plant stature (cm), grains spike-1, thousand grain weight, grain yield (kg ha-1).

RESULTS AND DISCUSSIONS

Plant Height (cm)

Data regarding plant height (cm) is shown in Fig. 1. which determines the information of foliage of soluplant fertilizer and are significantly ($P<0.05$) effected by different levels of soluplant fertilizer. The doses of integrated application of Soluplant @ 7.50 kg ha^{-1} produced maximum plant height (99.3cm), and also by the foliar application of Soluplant @ 6.25 kg ha^{-1}. However, with the application of Soluplant @ 5.0 kg ha^{-1}produced maximum plant height of 98.8 and 98.8 cm, respectively. The plant height revealed 96.3, 94.6 and 93.5 cm when crop was integrated with Soluplant @ 3.75 kg ha^{-1}, Soluplant @ 2.5 kg ha^{-1} and Soluplant @ 1.25 kg ha^{-1}, respectively. Moreover, plant height (91.1 cm) was recorded i\with Soluplant @ 0.00 kg ha^{-1} (control). The overall results suggested thatmaximal plant height was emphasized with the application of Soluplant @ 7.5 kg ha^{1} but statistically the differences among Soluplant @ 7.5 kg ha^{-1}Soluplant @ 6.25 kg ha^{-1} and Soluplant @ 5.0 kg ha^{-1} were non- significant. The results are concluded by Guenis [8] who also reported significant variations for plant height (cm) for foliar application of boron. Similarly, Kenbaev and Sade [9] alsointerpreted increase in number of plant height (cm) for application of boron.

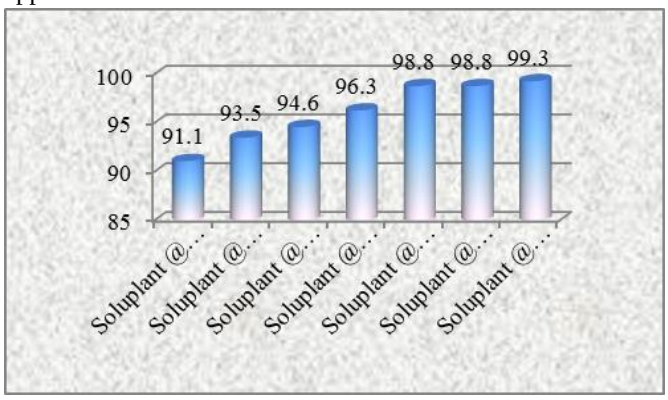

Figure 1. Foliar application of soluplant fertilizer for plant height (cm)

Grain spike^{-1}

The data in the figure 2 revealed that number of grains spike-1 was significantly affected by foliar application of soluplant fertilizer, during both growing seasons (Fig. 2). Highest number of grains spike^{-1} (42.1) was produced by Soluplant @ 7.50 kg ha^{-1} and were closely followed by foliar application of Soluplant @ 6.25 kg ha^{-1} and Soluplant @ 5.0 kg ha^{-1} Soluplant with 42.0 and 41.8 grains spike^{-1}. The spike length reduced to 40.8, 40.3 and 35.4 cm when crop was fertilized with Soluplant @ 3.75 kg ha^{-1}, Soluplant @ 2.5 kg ha^{-1} and Soluplant @ 1.25 kg ha.$^{-1}$However, less spike length (34.2) was recorded in Soluplant @ 0.00 kg ha^{-1} (Control). Consequently, the overall results suggested that although maximam spike length was recorded in Soluplant @ 7.5kg ha^{-1} but statistically the differences among Soluplant @ 7.5 kg ha^{-1}Soluplant @ 6.25 kg ha^{-1} and Soluplant @ 5.0 kg ha^{-1} were non-significant. The consequence are declared by Soleimani [10]. who reported recognizable increase in number of grain spike-1 of wheat for foliage strengthening of micronutrients.

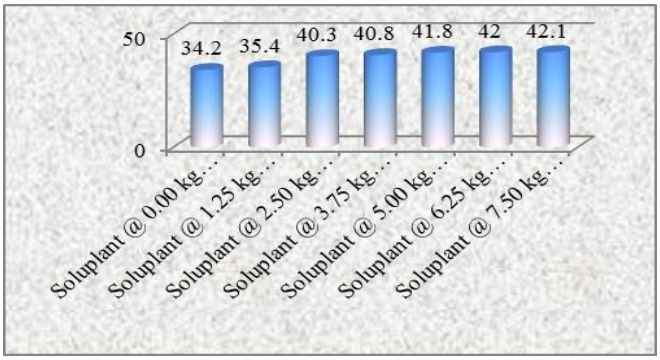

Figure 2.Foliar application of soluplant fertilizer for Grain Spike^{-1}

Thousand Grain Weight

The investigation of differentiate showed that the difference for thousand grain weight among different treatments during cropping seasons 2015-16 are presented in Fig. 4. The data indicated foliar application Soluplant @ 7.50 kg ha^{-1} producing maximum seed index (43.3), closely followed by foliar application of Soluplant @ 6.25 kg ha^{-1} and Soluplant @ 5.0 kg ha^{-1}Soluplant with equal 42.7 and 42.0 g seed index, respectively. The seed index reduced to 42.6, 42.6, 40.5, 39.7 and 38.4 g when crop was fertilized with Soluplant 3.75 kg ha^{-1}, Soluplant 2.5 kg ha^{-1} and Soluplant @ 1.25 kg ha^{-1}, respectively. However, minimum seed index (36.4 g) was recorded in Soluplant @ 0.00 kg ha^{-1} (control). Moreover, the overall results suggested that although maximam seed index was produced with Soluplant @ 7.5 kg ha^{-1} but statistically the differences was observed among Soluplant @ 7.5 kg ha^{-1} Soluplant @ 6.25 kg ha^{-1}, whereas Soluplant @ 5.0 kg ha^{-1} were non-significant. Hence, foliar application of Soluplant @ 5.0 kg ha^{-1} was found economical for obtaining optimum thousand grain weight of wheat variety. These, consequences was also seemed by Soylu [11]. who reported significant raise in thousand grains weight with foliage feeding of micronutrients.

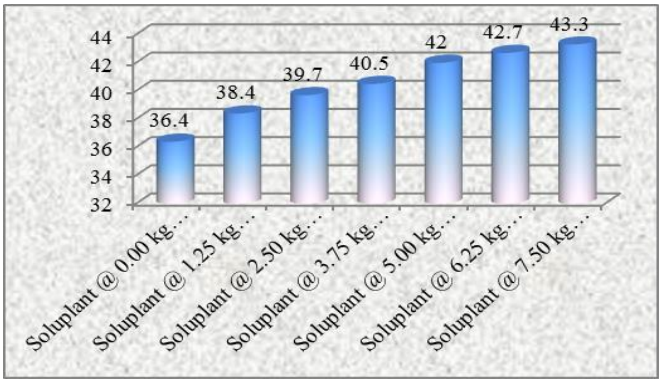

Figure 3.Foliar application of soluplant fertilizer for Thousand Grain Weight

Biological yield (kg ha^{-1})

The record of natural yield uncovered huge raise with foliage bolstering of soluplant fertilizer produced highest biological yield (9242.3 kg ha^{-1}), closely followed by foliar application of Soluplant @ 6.25 kg ha^{-1} and Soluplant @ 5.0 kg ha^{-1} with 8776.7 and 8614.3 kg ha^{-1} biological yield. The biological yield diminished to 8776.7, 8614.3, 8373.2, 8173.2 and 7997.9 kg ha^{-1}) when product was treated with Soluplant 3.75 kg ha^{-1}, Soluplant 2.5 kg ha^{-1} and Soluplant @ 1.25 kg ha^{-1}, respectively. However, none the less biological yield (7718.8 kg ha^{-1}) was recorded in Soluplant @ 0.00 kg ha^{-1} (control). Moreover, the overall final results suggested that though numerical maximal biological yield was saved in Soluplant @ 7.5 kg ha^{-1} but statistically the differences among Soluplant @ 7.5 kg ha^{-1}, Soluplant @ 6.25 kg ha^{-1} and Soluplant @ 5.0 kg ha^{-1} were non-significant. The results are confirmed by Sadana [12]. reported increased waterless matter production with Mn application., Soleimani [10] Similarly finished up the record increment in natural yield for foliage nourishing of (Zn). The result recorded by Torun and Grewal [13.14] who reported expanded dry matter generation for use of micronutrients over control.

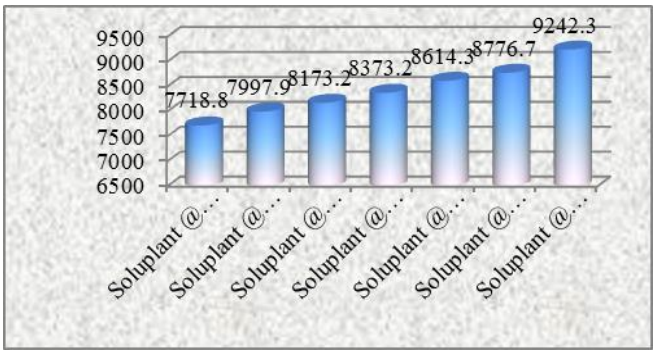

Figure 4: **Foliar application of soluplant fertilizer fo Biological Yield (kg ha^{-1})**

Grain yield (kg ha^{-1})

Grain yield is complex trait. The data on grain yield indicated significant increase for foliar application soluplant fertilizer over control treatments. The mean grain yields of the treatments during cropping seasons 2015-16 are presented in Fig. 4. Maximum grain yield was recorded with Soluplant @ 7.50 kg ha^{-1} (4760.0kg ha^{-1}) which almost showed high yield with foliage utilization of Soluplant @ 6.25 kg ha^{-1}and Soluplant @ 5.0 kg ha^{-1}Soluplant with 4484.1 and 4760.0 kg ha^{-1} grain yield. The grain yield reduced to 4484.1, 4293.8, 4160.4, 4043.7 and 3034.6 kg ha^{-1} when the application of then the supplement with Soluplant @ 3.75 kg ha^{-1}, Soluplant @ 2.5 kg ha^{-1} and Soluplant @ 1.25 kg ha^{-1}, individually. Nonetheless, least grain yield (3629.3 kg ha^{-1}) was recorded withSoluplant @ 0.00 kg ha^{-1} (control). In addition, the general results proposed that highest grain yield was recorded with Soluplant @ 7.5 kg ha^{-1} but statistically the differences among Soluplant @ 7.5 kg ha^{-1} Soluplant @ 6.25 kg ha^{-1} and Soluplant @ 5.0 kg ha^{-1} were non-significant.. Hence, foliar application of Soluplant @ 5.0 kg ha^{-1} was found economical for obtaining optimum grain yield of wheat variety. Sharar and Asghar [15.16] also revealed that grain yield of oat harvests extended with associated of NPK integrated. These recorded were incurred with the results by Chaudry [17] who expressed that boron application alongside basal measurements of NPK fundamentally expanded the wheat yield. Uddin [18].likewise acquired half yield increment by the application micronutrients of Kumar [19].

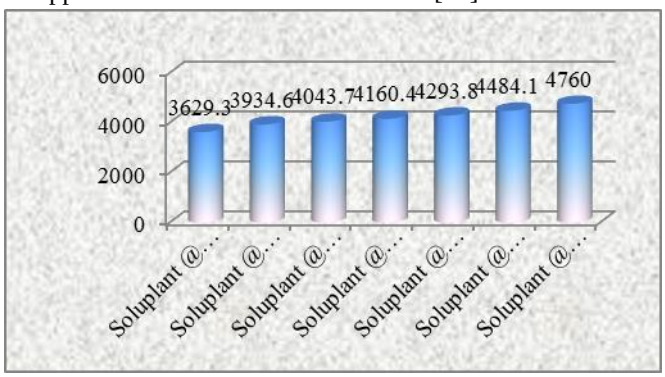

Figure 5.**Foliar application of soluplant fertilizer for Grain Yield (Kg ha^{-1})**

CONCLUSION

It is concluded that at different levels the overall application of Soluplant fertilizer exerted positive and significant affect on growth and yield associated with wheat variety Benazir. Foliar application of Soluplant @ 5.00 kg ha^{-1} proved to be most suitable treatment for obtaining optimum yield due to having non-significant (LSD.0.05) statistical differences with Soluplant @ 7.50 kg ha^{-1} and Soluplant @ 6.25 kg ha^{-1}.

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