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Title: EFFICACY OF SEAWEED (*Kappaphycus alvarezii*) SAP ON GROWTH AND PRODUCTIVITY OF WHEAT

Publisher: Birsa Agricultural University, Kanke, Ranchi, Jharkhand

Language: en\_US

Type: Thesis

Pages: 366

Agrotags: null

Keywords: EFFICACY OF SEAWEED (*Kappaphycus alvarezii*) SAP ON GROWTH AND PRODUCTIVITY OF WHEAT

**Abstract:** Present plateau level of wheat productivity needs to be boost up to feed the ever-growing population of India through genetic enhancement as well as through innovative agronomic management practices. Use of seaweed sap to boost up the crop productivity is an innovative agronomic management option as it contain several nutrients and growth hormone, which promotes sustainable growth and yield of crops. Keeping these facts in view, field experiments were conducted at Birsa Agricultural University Farm, Ranchi (23o17”N latitude,85o10” E longitude and 625 m above mean sea level), Jharkhand, India, during Rabi season of 2013-15 on sandy-loam soil, moderately acidic (pH 5.5), low in organic carbon (30 g kg<sup>-1</sup>), available nitrogen (175.6 kg ha<sup>-1</sup>), high in available phosphorus (26.8 kg ha<sup>-1</sup>) and medium in available potassium (171.1 kg ha<sup>-1</sup>),sizable total microbes (68.8×10<sup>5</sup> g<sup>-1</sup>soil) and micronutrient (Fe:26.3; Cu:0.85; Mn:22.7 and Zn:0.75 ppm) within critical range, to find out the “Efficacy of seaweed (*Kappaphycus alvarezii*) sap on growth and productivity of wheat”. Experiments were laid out in randomized block design, replicated thrice, with 12 treatments consisting of 6 different concentration of K sap (0.0, 2.5, 5.0, 7.5, 10.0 and 15%) and two levels of fertilizer (50 and 100% recommended dose of fertilizer, 120:60:40 kg N:P2O5:K2Oha<sup>-1</sup>). Two set of experiments were conducted, one with spraying of seaweed sap, thrice at 25,45and 65 DAS, whereas in the second experiment seeds were soaked for overnight with different concentration of seaweed sap before sowing, followed by spraying with respective sap concentration. Wheat fertilized with 100% RDF, produced maximum grain (41.5 & 42.6 q ha<sup>-1</sup>) and straw yield (70.1 & 73.7 q ha<sup>-1</sup>),which were 25& 27 and 30& 21% higher than crop fertilized with 50% RDF, due to higher leaf area index, total tillers, chlorophyll content and dry matter, resulting into higher yield attributes like effective tillers (351.1 & 374.6 m<sup>-2</sup>),grains per spike (35.9 &37.0) and 1000 grain weight (44 & 44.2 g), and ultimately gave39 & 36% higher net return and 27 & 23% B:C ratio, in first and second experiment respectively. Even though, wheat raised with 100% RDF, remove higher N,P,K and micronutrient but able to maintain initial soil fertility status after two crop cycle. Spraying of 7.5% K sap alone or seed priming followed by spraying of 7.5% K sap produced maximum grain (40.9 & 41.9 q ha<sup>-1</sup>) and straw yield (69.6 & 74.6 q ha<sup>-1</sup>), which were 19 & 20 and 28 & 26 % respectively higher than spraying alone or seed priming followed by spraying of water, due to higher LAI, total tillers, chlorophyll content and dry matter, resulting into higher yield attributes like effective tillers (352.1 & 378.2 m<sup>-2</sup>),grains per spike (36.5 & 37.1) and 1000 grain weight (44.3 & 44.7g), which gave 26 & 26% higher net return and B:C ratio (10 & 11%) in first and second experiment respectively. Crop sprayed with 7.5% K sap alone or along with seed priming removed higher N, P, K and micronutrient, but able to maintain initial soil nutrient status after completion of 2 crop cycle. Wheat fertilized with 100% RDF and spraying alone or seed priming followed by spraying of 7.5% K sap produced maximum grain (45.4 & 47 q ha<sup>-1</sup>) and straw yield (78.7 & 82.5 q ha<sup>-1</sup>), which were 19 & 20% and 29 & 30% respectively higher than wheat fertilized with 100% RDF and where spraying alone or seed priming followed by spraying of water, due to higher leaf area index, crop growth rate, chlorophyll content and dry matter, resulting into higher yield attributes like effective tillers (388.5 & 416.6 m<sup>-2</sup>), grains per spike (39.8& 40.8) and 1000 grain weight (45.8 & 46.2g), which gave 27 & 28% higher net return ( ` 60354.9 ha<sup>-1</sup> and 63974.4 ha<sup>-1</sup>)in first and second experiment respectively. However maximum B:C ratio (1.85 and 1.96 in first and second experiment respectively) was recorded in the crop fertilized with 100% RDF along with 5% K sap, which had an edge over 7.5% K sap along with100% RDF. Wheat fertilized with 100% RDF and spraying alone or seed priming followed by spraying of 7.5% K sap improved available soil N (187.1 and 185kg ha<sup>-1</sup>) and P (29.2 and30.8kg ha<sup>-1</sup>), whereas available K depleted (164.7 & 162.7 kg ha<sup>-1</sup>) from its initial values in first and second experiment respectively, although crop removed higher N,P,K and micronutrient. Wheat should be fertilized with 100% RDF and sprayed with 7.5% K sap for maximum productivity, whereas for maximum profitability 5% K sap should be used. Application of 7.5% K sap along with 50% RDF can compensates the 50% fertilizer requirement of the crop. Seed priming followed by spraying of 7.5% K sap along with 100%RDF can further boost up the productivity of wheat by 4%.

**Description:** EFFICACY OF SEAWEED (*Kappaphycus alvarezii*) SAP ON GROWTH AND PRODUCTIVITY OF WHEAT

**Subject:** Agronomy

**Theme:** EFFICACY OF SEAWEED (*Kappaphycus alvarezii*) SAP ON GROWTH AND PRODUCTIVITY OF WHEAT

These Type: Ph.D

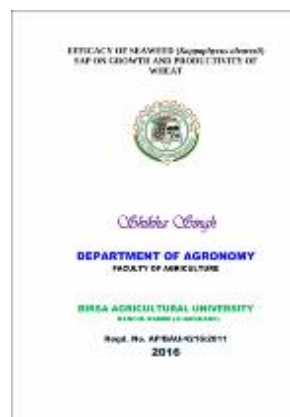
Issue Date: 2016

Appears in Thesis (/handle/1/93550)

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