Research Article

Effect of Bio Herbal Growth Promoter on Growth and Yield of Wheat Grown under Organic Management

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Abstract

A field experiment was conducted during rabi season of 2015-16 in clay loam soil of Instructional Farm, Rajasthan College of Agriculture, MPUAT, Udaipur to study the effect of Go Bhu Sampada on growth and yield of Wheat grown under organic management. Application of Go Bhu Sampada at 15 g/litre water resulted in the maximum number of tillers/plant (358.81), test weight (41.49) and grain (26.23 q/ha) and straw yield (62.53 q/ha) of wheat in comparison to 5, 10, 20 g/litre water and control (only water spray). It remained at par with 20 g Go Bhu Sampada/litre water in respect of plant height and test weight. Application of Go Bhu Sampada 15 g/litre water increased the grain yield of wheat by 11.09, 7.89, 9.29 and 16.06 per cent over 5, 10, 20 g Go Bhu Sampada/litre water and control (only water spray), respectively.

Keywords: Go Bhu Sampada, growth, seed yield, wheat

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Introduction

Wheat (*Triticum aestivum*) is one of the prehistoric crops which provides major energy requirement of human diet across the world. Wheat is the second most important cereal in India after rice contributing substantially to the national food security by providing more than 50 per cent of the calories to the people who mainly depend on it. According to FAO estimate, world would require 840 m t of wheat by the year 2050. The production of wheat grain in the year 2013-14 was estimated to be 95.91 m t from acreage of 31.19 m ha at a yield level of 3075 kg ha^{-1}. During this period, Rajasthan accounted for about 9.01 per cent of the national area and 9.3 per cent of production with average productivity of 3175 kg ha^{-1} [3]. The estimated national production for 2014-15 however, has shown a decline and is anticipated to be about 88.94 m t [1]. During the past three decades, intensive agriculture involving exhaustive high yielding varieties has led to heavy withdrawal of nutrients from the soil. The productivity of a crop is controlled by many factors of which the mineral nutrition especially of nitrogen is by and large. The most important factor is that the heavy and imbalanced use of chemical fertilizer has led to think about the use of organic manures in intensively growing areas for sustainable production system [2]. Therefore, to sustain the land and to achieve production potential of crops, judicious use of organic manures and their scientific management is important [3]. Wheat yield can be increased by supplementing the nutrient requirement of wheat with additional application of growth regulating/enhancing products. A number of options need to be studied in this direction. The study of effect of Go Bhu Sampada on growth and yield of wheat is one such an option which had been evaluated during *Rabi*, 2015-16.

Materials and Methods

The experiment was conducted during during rabi season of 2015-16 at Instructional Farm, Rajasthan College of Agriculture, MPUAT, Udaipur, Rajasthan, India. The site is situated at south-eastern part of Rajasthan at an altitude of 579.5 m above mean sea level, at 24º35' N latitude and 73°42' E longitude. The soil was clay loam with pH 8.2. The soil was low in available nitrogen (251.27 kg/ha), medium in available phosphorus (19.89 kg/ha) and high in available potassium (369.53 kg/ha). The experiment consisted of 5 doses and 3 stage of application with three replications and with total 15 treatments. The net plot size was kept 12 m^2 (5.0 m × 2.4 m). Three sprays as foliar application of Go Bhu Sampada were given on 5th January (3 WAS), 27th January (6 WAS) and 17th February (9WAS) during 2015. Knapsack sprayer with flat fan nozzle was used for foliar spray. Water 500 lit/ha was used for foliar spray. The wheat cv. 'C 306' was sown manually by keeping the row and plant distance of 22.5cmx 10cm. The C 306 is a wheat variety suitable for timely sown and rainfed conditions. The variety normally takes 136-140 days to mature. The grains of "C 306" are hard & bold having golden yellow colour. On maturity, the plants of the variety attain a height of 110-120 cm. The variety is very good for chapati making. Protein content in seed is 11-12

percent.The details of physical & chemical parameters of Go Bhu Sampadaare given in **Table 1**.

Table 1 Composition in Go BhuSampada

Physical Parameters	
Colour	Brownis yellow coloured liquid
Odour	Stringent fermented smell
Bulk density	1.04
Moisture	86.2
pH	7.09
Extracts	
Acetica acid residue	2.50 %
Ricinuscommunus extract	0.46 %
Allium cepa extract	0.23 %
Ocimumbasillicum extract	0.20 %
Ambellaribes extract	0.10 %
Achyranthusaspera extract	0.40 %
Starch powder	10.00 %
Received from funding agency	

Results and Discussion

Effect of Go Bhu Sampada on Plant height

Application of go bhu sampada 15 g/litre water recorded the maximum plant height of wheat (102.14 cm) and 13.40 per cent increase overcontrol (only water spray). However, it was found statistically at par with 5, 10 and 20 g/litre water, respectively. Application of go bhu sampada at different stages of wheat significantly influenced the plant height of wheat at harvest. Application of Go bhu sampada at 9 WAS significantly increased plant height over 3 & 6 WAS by 9.24 and 5.69 per cent, respectively (**Table 2**).

Table 2 Effect of Go Bhu Samada on plant population, growth parameters, yield attributes and yields of Wheat

Treatments		**Plant population (Lac/ha)**	**Plant height at harvest (cm)**	**No. of tillers/ plant**	**Test weight (g)**	**Grain yield (q/ha)**	**Straw yield (q/ha)**
A. Doses							
D_1	Go Bhu Sampada @ 5g/Litre water	4.5	99.84	353.96	38.99	23.61	55.07
D_2	Go Bhu Sampada @ 10g/ Litre water	4.5	101.84	356.62	39.78	24.31	58.02
D_3	Go Bhu Sampada @ 15g/ Litre water	4.4	102.14	358.81	41.49	26.23	62.53
D_4	Go Bhu Sampada @ 20g/ Litre water	4.5	101.96	338.93	41.38	24.00	51.63
D_0	Control (only water spray)	4.6	90.07	332.49	38.57	22.60	43.67
	SEm±	0.1	2.22	3.73	0.43	0.60	1.77
	C.D.5%	NS	6.44	10.81	1.24	1.73	5.13
B. Stage of application							
S_1	3 WAS	4.5	95.17	338.44	39.48	22.07	50.65
S_2	6 WAS	4.5	98.37	350.50	39.94	24.61	52.89
S_3	9 WAS	4.5	103.97	355.54	40.70	25.77	59.02
	SEm±	0.0	1.72	2.89	0.33	0.46	1.37
	C.D.5%	NS	4.99	8.37	0.96	1.34	3.97

Effect of Go Bhu Sampada on yield attributes and yield

Number of tillers/plant

Go bhu sampada applied at the rate 5, 10 and 15 g/litre water were found equally efficient with regards to effect on tillers/plant in wheat. Application of go bhu sampada at the rate 15 g/litre significantly increased the number of

tillers/plant over 20 g/litre water and control (only water spray) by 5.87 and 7.92 per cent, respectively. Among different stage of applications the maximum number of tillers/plant were noticed when go bhu sampada was applied at 9 week after sowing over 3 and 6 week after sowing (Table 2). It was significantly superior over the application of go bhu sampada at 3 WAS and was at par with application of go bhu sampada at 6 WAS.

Preparation of Go BhuSampada solution

Spray of Go BhuSampada in wheat

No. of tillers in wheat with or without spray of Go BhuSampada

View of experimental crop (wheat)

Wheat sprayed with Go BhuSampada

Wheat view with only water spray

Test weight

Application of go bhu sampada at the rate 15 g/litre water (41.49 g) significantly enhanced test weight of wheat over 5, 10 g go bhu sampada/litre water and only water spray by 6.41,4.30 and 7.57 per cent, respectively and it was statistically at par with application of 20 g go bhu sampada/litre water (41.38 g).The maximum test weight (40.70 g) of wheat was recorded with the application of go bhu sampada at 9 week after sowing of wheat which was

significantly higher by 3.09 per cent over control (only water spray). It was at par with the application of go bhu sampada at 6 WAS in wheat (Table 2).

Grain yield

The application of go bhu sampada at 15 g/litre water significantly increased the grain yield (26.23 q/ha) of wheat by 11.09, 7.89, 9.29 and 16.06 per cent over 5, 10, 20 g go bhu sampada/litre water and control (only water spray), respectively.Among the different stages of application, application of go bhu sampada at 9 week after sowing of wheat recorded significantly higher grain yield of wheat over the application of go bhusampadaat 3 week after sowing during crop periodand it was statistically at par with application of go bhusampada at 6 week after sowing (Table 2).

Straw yield

The maximum straw yield of wheat was registered by applying go bhu sampada at the rate 15 g/litre water. The highest straw yield (59.02 q/ha) was recorded with the application of go bhu sampada at the rate 15 g/litre water which was significantly higher by 13.5, 7.77, 20.53, 43.19 per cent over 5, 10, 20 g go bhusampada/litre water and control (only water spray), respectively.Among different stages of GBS revealed that application of go bhusampada at 9 week after sowing recorded significantly higher straw yield of wheat over the application of Go bhu sampada at 3 week after sowing and 6 week after sowing (Table 2).

Discussion

Plant height, yield attributes, grain & straw yield of wheat showed significant response to dose and stage of application of go bhu samapada in wheat. Go bhu sampada contains various ingredients of cow urine& herbal extract with nutrients & alkaloids prepared on the basis of existing indigenous knowledge which might result into better photosynthesis, removal of stress from plant and facilitating availability of nutrients & water to plants. [3-5]. Cows urine is suggested for improving general health of plants due to anti-infective & growth promoting bio-active molecules and hence it is bioavailability enhancer [6-9]. The herbal extracts used in go bhu sampada like basil, embeliaribes, garlic, castor and latjeera (Achyranthus) constitute a rich sources of bioactive molecules [9-11].

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