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**AK Jha**  
Jawaharlal Nehru Krishi  
Vishwavidyalaya, Jabalpur,  
Madhya Pradesh, India

**Suneeta Pandey**  
Jawaharlal Nehru Krishi  
Vishwavidyalaya, Jabalpur,  
Madhya Pradesh, India

**Dinesh Pandey**  
Barrister Thakur  
Chhedilal College of Agriculture  
& Research Station Bilaspur,  
Chhattisgarh, India

**RK Meshram**  
College of Agriculture,  
Pawarkheda, Madhya Pradesh,  
India

**Corresponding Author:**  
**AK Jha**  
Jawaharlal Nehru Krishi  
Vishwavidyalaya, Jabalpur,  
Madhya Pradesh, India

## Effect of fertilizer management with growth regulator on growth and yield of wheat

**AK Jha, Suneeta Pandey, Dinesh Pandey and RK Meshram**

### Abstract

The present investigation was conducted with the aim to know the effect of fertilizer management and plant growth regulators on the yield and yield attributes of the wheat cultivar GW-366. The present study was conducted at Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) in the split plot design the treatments consist of four nutrient management, absolute control, RDF (Recommended dose of fertilizer) 150:60:40, 150% RDF.(225:90:60), 150% RDF+15 t FYM /ha- in main plots and four plant growth regulators, control- two sprays of water (400 lit water /ha) at first node and flag leaf stages. two spray of Chlormequat chloride (CCC) (Lihocin @ 0.2% (800 ml ha-1) of commercial product dose at first node (Around 45 DAS) and flag leaf (Around 80 DAS) using 400 lit water. two sprays of Tebuconazole (Folicur 430 SC) @ 0.1% at (400 ml ha-1) First Node and Flag leaf with 400 lit water ha. two spray combined application of Lihocin + Folicur in sub-plots. The highest yield was recorded under the treatment 150% RDF+FYM (49.00 q/ha) as compared to all other treatments.

**Keywords:** Fertilizer, management, regulator, wheat

### Introduction

Wheat (*Triticum aestivum* L.) is the second most significant cereal in India following rice, contributing substantially to the national food security by providing more than 50% of the calories to the people who mainly depend on it. For the last several years, India is the second largest producer of wheat in the world next to China. According to USDA, wheat production of India was estimated 80.71 million tones. The use of growth regulators with retardant properties is one of the important factors of grain production intensification. At present and in the future, growth regulators will become increasingly important not only for increasing the resistance of plants to lodging, but also for purposeful management of physiological metabolic processes for crop formation Zeevaart 2010 and Zeevaart 2015 <sup>[1, 2]</sup>. Currently, significant progress is being observed in understanding the mechanism of action of the components of the hormonal regulation system, in the interaction of genetic and hormonal regulation of plant development. The emergence of new tools, such as synthetic growth regulators that interrupt the biosynthesis of individual hormones, combined with the use of plants that carry a mutation in the pathway of hormone biosynthesis or the transmission of a hormonal signal, has determined strategic achievements in the field of genetic control of plant development. Thus, having studied the nature of phytohormones-plant growth inhibitors, scientists hastened to synthesize artificial analogues Salygin *et al.* 2019 <sup>[3]</sup>. This experiment was conducted to maximize wheat yield using enhanced fertilisation coupled with crop growth regulators i.e. Chlormequat chloride (Lihocin) and Tebuconazole (Folicur 430 SC).

### Materials and Methods

Field experiment was conducted at Research Farm AICRP on Wheat Department of Plant Breeding and Genetics, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) during Rabi season, 2017-18. The topography of the field in experimental area was fairly uniform. All facilities including irrigation water were adequately available on the research farm to carry out the field experiment. texture with 236.8 kg/ ha available N (Subbaih and Asija, 1956), 20.10 kg/ha available P (Olsen *et al.*, 1954), 272.3kg/ha available K (Jackson, 1967) 0.62% organic carbon and soil pH of 7.3 (1:2.5 soil and water ratio). This trial was conducted in split plot design. The experiment consisted of 12 treatments Control, RDF, 150% RDF and 150%+ RDF in main plot and application of Control-Water spray, two spray of 0.2% Chlormequat chloride, two spray of 0.1% Tebuconazole and two spray of Chlormequat chloride (Lihocin) and Tebuconazole (Folicur 430 SC) in sub plot. The treatment were replicated three times.

All the data for wheat were pooled statistically and then data were statistically analysed using OPSTAT statistical program.

## Result and Discussion

### Yield attributes

Application of growth retardants reduced plant height drastically as compared to control. Minimum plant height was observed under two sprays of Lihocin (82.88 cm) followed by two sprays of Lihocin+Folicur (82.99 cm). According to Voronov *et al.* 2022 [4], the latest data, retardants do not inhibit the growth of all shoots on the plant, but only the central one, thereby ensuring the formation of an aligned productive stem in the future. But in addition to the above, retardants have a significant impact on numerous indicators of the physiological and biochemical vital activity of plants, in particular on the processes of photosynthesis.

**Yield:** Grain, straw and biomass yield increased significantly with increasing nitrogen levels. The highest yield was recorded under the treatment 150% RDF+FYM (49.00 q/ha) as

compared to all other treatments. Application of crop growth regulators alone or in combination, significantly improved the productivity compared to control treatment. The increased grain, straw and biomass yield might be due to the improvement in growth and yield attributing characters and higher photosynthetic activity. The treatments having two sprays of Lihocin or two sprays of Folicur were statistically at par whereas the treatment where two sprays of Lihocin+Folicur (42.81 q/ha) were applied, the yield improved was statistically higher than all other treatments. The observations were in conformity with the findings of Singh *et al.* 2018 [5], and Kapari *et al.* 2020 [6].

### Economics

The results revealed that different fertilizer management practices and use of growth regulators has significant effect on net return and B:C ratio. Cost of cultivation was maximum in the treatment with application of 150% RDF with growth regulator spray but the net return was maximum with application 150% RDF with growth regulator spray.

**Table 1:** Effect of different treatments on growth and yield attributes characters in wheat

	Plant ht.	Earhead/ sq.m.	Grains/ Earhead	1000 wt	Grain yield kg/ha	Straw yield kg/ha
<b>Fertilizers Management</b>						
Absolute control	66.18	277	33.73	32.63	3043	5769
RDF (Rec.dose of fert)	82.74	271	37.91	35.54	3637	6400
150% RDF	88.15	266	42.97	36.92	4224	6987
150% RDF + 15 t/ha FYM	92.76	267	47.69	38.80	4934	7354
CD at 5%	5.67	12.45	1.23	0.34	123	156
<b>Growth regulators</b>						
Control-Water spray	79.84	267	39.13	34.80	3709	6433
Two spray of Lihocin	82.02	271	40.68	35.32	3896	6598
Two spray of Folicur	83.01	276	40.73	36.77	4039	6799
Two spray of Lihocin+ Folicur	84.96	282	41.76	36.99	4194	6983
CD at 5%	3.44	8.65	1.22	0.88	155	199

**Table 2:** Effect of different treatment on economics

	Cost of Cultivation Rs/ha	GMRs Rs/ha	NMRs Rs /ha	B:C ratio
<b>Fertilizer Management</b>				
Absolute control	22896	66946	44050	2.92
RDF (Rec.dose of fert)	26758	80014	53256	2.99
150% RDF	27865	92928	65063	3.33
150% RDF + 15 t/ha FYM	29865	108548	78683	3.63
CD at 5%	1654	3467	1567	0.06
<b>Growth regulators</b>				
Control-Water spray	22987	81598	59611	3.41
Two spray of Lihocin	24786	85712	60926	3.46
Two spray of Folicur	24899	88858	63959	3.57
Two spray of Lihocin+ Folicur	25433	92268	66835	3.63
CD at 5%	1678	3267	1698	0.65

## References

- Voronov SI, Vlasova OI, Shtyrkhunov VD, Govorkova SB, Savinov EV. The effect of growth regulators with retardant properties on the growth and development of winter wheat IOP Conf. Series: Earth and Environmental Science, 2021, 843.
- Zeevaart JAD, Gage DA, Cleerman RA. Recent studies of the metabolism of abscisic acid *Plant Growth Substances* (Berlin, Heidelberg: Springer-Verlag), 2010, 233-240.
- Zeevaart JAD, Rock CD, Fantouzzo F, Heath TG, Gage DA. Metabolism of abscisic acid and its physiological implications *Abscisic Acid: Physiology and Biochemistry* (Oxford, UK: BIOS Scientific), 2015, 39-52.
- Salygin AN, Vlasenko MV, Kulik AK, Pleskachev Yu N. Modeling of ecosystem dynamics. Nonlinearity and synergetics IOP Conf. Series. Earth and Environmental Science. 2019;341:012103
- Singh VK, Brahma SD, Mishra RP, Shukla AK, Timsina J, Upadhyay PK, *et al.* Yields, Soil Health and Farm Profits under a Rice-Wheat System: Long-Term Effect of Fertilizers and Organic Manures Applied Alone and in Combination. *Agronomy*. 2018;9(1):1-22.
- Kapri Manisha, Kesarwani Amit K, Kumara Rajeew, Tripathi Ajay Kumar. Impact of Growth Regulators and Precision Nitrogen Management Techniques on Growth Parameters of Wheat *International Journal of Tropical Agriculture*. 2022;38(4). ISSN: 0254-8755