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Impact assessment of balance does of fertilizer in wheat crop

¹Anant Kumar, ²Rashmee Yadav, ³Brij Vikas, ⁴Ankur Jha and ⁵Indra Pal Singh

¹Senior Scientist and Head, Krishi Vigyan Kendra, Gwari, Auraiya, Krishi Vigyan Kendra, Kasganj, Uttar Pradesh, India

²SMS, Department of Home Science, Krishi Vigyan Kendra, Gwari, Auraiya, Krishi Vigyan Kendra, Kasganj, Uttar Pradesh, India

³SMS, Department of Animal Science, Krishi Vigyan Kendra, Gwari, Auraiya, Krishi Vigyan Kendra, Kasganj, Uttar Pradesh, India

⁴Program Assistance, Department of Agriculture, Krishi Vigyan Kendra, Gwari, Auraiya, Krishi Vigyan Kendra, Kasganj, Uttar Pradesh, India

⁵SMS, Department of Horticulture, Krishi Vigyan Kendra, Gwari, Auraiya, Krishi Vigyan Kendra, Kasganj, Uttar Pradesh, India

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Corresponding Author: Anant Kumar

Abstract

Reducing the effect of heavy doses of nitrogenous fertilizer through use of slow-release N fertilizer. Krishi Vigyan Kendra, Auraiya, Uttar Pradesh conducted an On-Farm Trial on Wheat crop at to reduce the heavy doses of nitrogenous fertilizer (Urea) by use of Neem coated urea fertilizer it has been coated Urea (1 Basal+ split doses), there is an increase in net return from Rs. 44039 (Farmers Practice) to Rs. 611141 (Demonstration) due to increase in grain yield from 47.48 Q/ha to 58.6 Q/ha. The B:C Ratio of 2:51:1.0 has been observed in the On Farm Trial plot. To increase crop profitability, enhance food security and save the money in the central Plain region enabling approaches are needed to effectively communicate the benefits of balanced nutrient use practices to farmers. Unbalanced fertilizer use (both over-dose and under-dose) is commonly reported, and is a major cause of yield gaps and food insecurity especially where agriculture is based on small holder farms for example, estimated average yield losses because of K-omission were around 0.62, 0.72 and 0.70 t ha⁻¹ for Paddy, Wheat and Maize, respectively in farmers' fields in India. The application of balanced nutrient can increase yield of Mustard by 50%, Potato by 34–38% and rice by 17–23% compared with farmers' yield in Bangladesh. On the other hand, overuse of nutrients relative to crop requirements, especially N and P, causes low nutrient use efficiency, and negative environmental impacts such as increased greenhouse gas (GHG) emission and groundwater contamination. Still, it remains unclear how closely farmers in the EGP follow recommended fertilizer rates especially under diverse rice-based cropping patterns.

The intensification of cropping and increase use of modern varieties have been supported by increased use of fertilizers over the last two decades in the EGP. Government-endorsed fertilizer recommendations aim to provide best fertilizer use guidelines for profitable yields on farms. But government-endorsed fertilizer recommendations often failed to achieve their goal. Moreover, the complexity of using the recommended fertilizer dose is another challenge for farmers. For example, chemical fertilizers like di-ammonium phosphate (DAP—N & P), triple superphosphate (TSP-P & S), magnesium sulfate (MgSO₄-Mg & S) provide more than one nutrient element to the crop field. Furthermore, organic materials (cow-dung, poultry litter, vermicompost, crop residue etc.) have variable nutrient composition which is often not accounted for in calculations.

Keywords: Nitrogenous fertilizer, unbalanced fertilizer use etc.

Introduction

In wheat crop, only 40 to 50% of the recommended amount of fertilizers is used as nitrogen fertilizer. While 120 kg nitrogen is required by scientists for the use of nitrogen in wheat crop but farmers ignorantly just use nitrogen fertilizer in the field in the form of urea at the rate of 180 to 200 kg/hectare. Due to which the growth of the crop becomes very high, there is a lot of disease and pest attack in the crop. At the same time, it costs the farmers a lot to produce the wheat crop. Most importantly, the Government of India provides information to the farmers about soil health. The card has been made available. The main objective of providing soil health card is that the farmers should use

chemical fertilizers in their fields only on the basis of soil health card, because not using chemical fertilizers as per the soil health card will affect the soil health. It has a huge impact due to which the crop yield is decreasing and even the cost is increasing every year and the crop production is decreasing. Farmers use only 20 to 25% of the nitrogen fertilizer they apply to their fields. The remaining 75 to 80 percent of nitrogen is lost, either it leaks into the ground along with water or gets released into the atmosphere due to excessive heat in the sun, causing huge losses to the farmer. Similarly, Auraiya Apart from the district, chemical fertilizers are being used extensively in other districts also, due to which a problem is arising at the national level that

the allocation of fertilizer as well as other fertilizers to the concerned district is based on the quantity recommended by the government. Whereas due to the farmers applying twice the recommended quantity, chemical fertilizers are not available at the time of crop production, due to which the problem of black marketing arises and the farmers are not provided the same at the right time and at the right price by

the government. Keeping in mind that chemical fertilizers are not being made available, a familiar test was organized on this subject by Krishi Vigyan Kendra Auraiya for using balanced quantity of nitrogen fertilizers in wheat crop. Five people from this village were selected for field testing in Dakhnai village Tash Khana Chhala of Auraiya district.

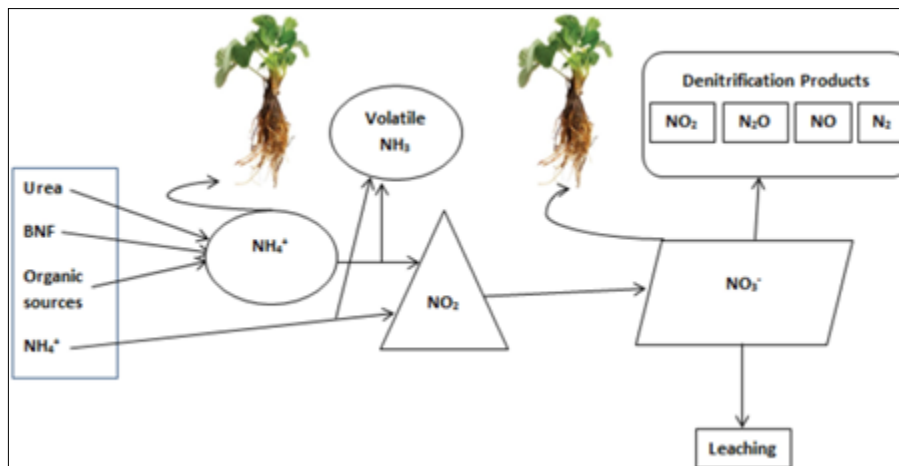


Fig 1: Fate of nitrogen in agriculture and environment: agronomic, eco-physiological and molecular approaches to improve nitrogen use efficiency

Other chemical fertilizers have a very important contribution in the wheat crop. Because nitrogen fertilizer is used in highest quantity in wheat crop, after that phosphatic fertilizer, potash and scheduled nutrients are used in very less quantity. Not applying fertilizer to the crop in balanced quantity reduces the yield. Farmers use DAP which contains 46% phosphorus and 18% nitrogen. Out of the 46% amount of phosphorus, only 15 to 20% are able to utilize it. The remaining quantity is lying unused in the ground. To utilize it, Azactobacter is used which makes the unused chemical fertilizer soluble and makes it available to the plant.

Materials and Methods

Problems of Wheat crops low yield due to imbalance dose of Nitrogenous fertilizer in different village of Auraiya, Uttar Pradesh.

The study shows that Low yield due to imbalance use of nitrogenous fertilizer in wheat crop Location of the study: two village were studied namely- Dakhanai and Purva Sattu block Achhalda District Auraiya, Uttar Pradesh. In through Krishi Vigyan Kendra Auraiya, in village 05 farmers were selected for Low yield due to imbalance use of nitrogenous fertilizer from district Auraiya UP India

Results and Discussion

Table 1: Effect of imbalance use of nitrogenous fertilizer in wheat crop

Technology Option	No. of trials	Yield (t/ha)	B:C Ratio
Farmers Practice (Basal-DAP) T2 split dose of urea doses)+2% foliar spray	05	47.84	2:13
Urea Broad casting (Basal-2split		55.72	2:39
Neem Coated urea (Basal+2splrt doses)+ 2 of foliar spray		58.06	2:51

Conclusion

Nitrogen fertilization is one of the most commonly used practice to increase crop yields throughout the world because of abundant availability of N fertilizers and their great effectiveness to increase yields compared with other organic fertilizers, such as manure and compost. Excessive application of N fertilizers in the last several decades, however, has resulted in undesirable consequences of soil and environmental degradations, such as soil acidification, N leaching to the groundwater, and greenhouse gas (N_2O) emissions. Crop yields have declined in places where soil acidification is high due to unavailability of major nutrients and basic cations and toxic effect of acidic cations. Other disadvantages of excessive N fertilization include increased cost of fertilization, reduced N-use efficiency, and negative impact on human and livestock health. To reduce excessive N fertilization, composited soil sample to a depth of 60 cm should be conducted for $\text{NO}_3\text{-N}$ test prior to crop planting and N fertilization rate be adjusted by deducting soil $\text{NO}_3\text{-N}$ content from the desirable N rate.

References

1. Franzluebbers AJ. Integrated crop-livestock systems in the southeastern USA. *Agron J.* 2007;99:361-372.
2. Herrero M, Thornton PK, Notenbaert AM, Wood S, Masangi S, Freeman HA, *et al.* Smart investments in sustainable food productions: Revisiting mixed crop-livestock systems. *Science.* 2010;327:822-825.
3. Eickhout B, Bouwman AP, van Zeijts H. The role of nitrogen in world food production and environmental sustainability. *Agric Ecosyst Environ.* 2006;116:4-14.
4. Ross SM, Izaurralde RC, Janzen HH, Robertson JA, McGill WB. The nitrogen balance of three long-term agroecosystems on a boreal soil in western Canada. *Agric Ecosyst Environ.* 2008;127:241-250.
5. Varvel GE, Peterson TA. Residual soil nitrogen as

- affected by continuous cropping, two-year, and four-year crop rotations. *Agron J.* 1990;82:958-962.
6. Schepers JS, Mosier AR. Accounting for nitrogen in nonequilibrium soil-crop systems. In: Follett RF, editor. *Managing Nitrogen for Groundwater Quality and Farm Profitability*. Madison, WI: Soil Science Society of America; c1991. pp. 125-137.
 7. Lenssen AW, Johnson GD, Carlson GR. Cropping sequence and tillage system influence annual crop production and water use in semiarid Montana. *Field Crops Res.* 2007;100:32-43.