

**Khet Bachao Abhiyan Series: ICAR RCER, Patna**  
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**No-19: Balanced Fertilization: Key to Success of "Save Farms Campaign"**

**Holistic approach for soil health, crop productivity and farmer prosperity:** India is an agrarian country where continuous growth in agricultural production is essential to ensure food and nutritional security for its growing population. Over past few decades, chemical fertilizers have played significant role in increasing crop productivity. However, excessive & imbalanced use of fertilizers has adversely affected soil health, environmental sustainability, and long-term productivity of agricultural lands. In this context, "Save the Farms Campaign" aims to preserve soil fertility, sustain crop productivity and ensure the long-term viability of farming systems. Balanced fertilization is one of the most important pillars for achieving these objectives.

**What is Balanced Fertilization?**

Balanced fertilization refers to application of all essential plant nutrients in right proportion (dose), at right time, and through right method using right sources (inorganic/organic) according to crop requirements and soil fertility status. It includes proper use of major nutrients such as N, P, K, as well as secondary and micronutrients like S, Zn, B, Fe, and others. The objective is not only to maximize crop yields but also to maintain the soil fertility and ecological balance over long-term.

**Problem of imbalanced/excessive fertilizer use:** In many parts of the country, farmers rely heavily on urea while often neglecting phosphorus, potash, micronutrients and organic manure application. This practice has led to several challenges:

- Nutrient imbalance in soils
- Reduced nutrient use efficiency of crops
- Increased cost of cultivation and reduced profitability
- Decline in soil organic carbon content
  - Poor soil physico-chemical and biological properties.
  - Increased incidence of pests and diseases
  - Groundwater contamination and environmental pollution
  - Gradual decline in soil productivity and sustainability

**Importance of balanced fertilization in save farms campaign:** Primary objective of Save Farms Campaign is to maintain healthy soils, conserve natural resources (soil and water), and improve farmers' livelihoods. Balanced fertilization contributes to these goals in several ways.

**1. Soil health improvement:** Soil is not merely a medium for crop growth; it is a living resource. Balanced fertilization helps maintain physical, chemical, and biological properties

of soil. It improves soil structure, water-holding capacity, microbial activity and nutrient availability.

**2. Enhanced fertilizer use efficiency:** When all nutrients are available in balanced proportion, plants can utilize applied fertilizers more efficiently. This results in higher yields with lower nutrient losses and better returns on fertilizer investments.

**3. Better crop yield & quality:** Balanced nutrient management promotes healthy crop growth, better grain filling, improved quality attributes, enhanced market value of agricultural produce.

**4. Reduced production costs & increased profitability:** Soil test-based fertilizer application avoids unnecessary nutrient application, reduces input costs, and improves net farm income.

**5. Environmental Protection:** Excessive nitrogen application often leads to nitrate leaching, greenhouse gas emissions, and environmental degradation. Balanced fertilization minimizes these risks and promotes climate-smart agriculture.

**6. Promote one health concept:** A healthy soil is basis for a healthy crops, and animal, leading to healthy environment and human well-being.

### **Key principles of balanced fertilization**

**Soil test-based nutrient management:** Every farmer should have soil tested at least once in every 2–3 years. Fertilizer recommendations based on the soil health cards (SHC) ensure efficient nutrient management and improves crop response.

**Integrated Nutrient Management (INM):** Balanced fertilization should integrate chemical fertilizers with organic sources such as farmyard manure (FYM), compost, vermicompost, green manure, crop residues, and biofertilizers. This approach improves soil health, enhances nutrient availability and sustains long term productivity of soil.

**Inclusion of micronutrients:** Deficiencies of zinc, sulphur, boron, and iron are increasingly reported across many agricultural regions. Their application is essential to achieve optimum crop yields and maintain soil fertility.

**Balanced Fertilization in rice–wheat cropping system:** Rice–wheat system is one of most dominant cropping systems in Eastern India. Continuous reliance on urea-based fertilization has resulted in deficiencies of potassium, sulphur, and zinc in many soils. Therefore, farmers should:

- Apply recommended doses of N, P, and K fertilizers.
- Use zinc sulphate and sulphur-containing fertilizers wherever required.
- Incorporate crop residues back into the soil (don't burn).
- Promote the use of biofertilizers and organic manures.
- Use neem-coated urea to improve nitrogen use efficiency.

### **Key Messages for Farmers**

- Apply fertilizers based on soil test recommendations.
- Do not depend solely on single fertilizer say urea for crop nutrition.
- Use micronutrients along with NPK fertilizers when required.
- Integrate organic and inorganic nutrient sources.

- Avoid burning crop residues; recycle them into the soil.
- Follow the correct sources, timing, proportion and method of fertilizer application.
- Regularly utilize Soil Health Card recommendations.

## **Conclusion**

Balanced fertilization is not merely a means of achieving better crop yields; it is a cornerstone of the soil health conservation, environmental protection, and farmers' prosperity. Success of "Save the Farms Campaign" depends on the adoption of soil test-based balanced and integrated nutrient management practices by farmers. Healthy soils are foundation of sustainable agriculture, improved productivity and long-term food security. Therefore, transforming the message "Save Farms, Save Soil, Adopt Balanced Fertilization" into a nationwide movement is warranted for securing the future of Indian agriculture.

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