

Integrated Nutrient Management For Sustaining Crop Productivity And Soil Health

Integrated nutrient management for sustainable crop production, improving crop quality and soil health, and minimizing environmental pollution

Milkha S. Aulakh*

*College of Agriculture, Punjab Agricultural University, Ludhiana 141004, Punjab, India, Email msaulakh2004@yahoo.co.in

Abstract

Laboratory, growth chamber and multiyear field studies were conducted with prominent cropping systems of the subtropical northwestern states of India including rice-wheat, rice-mustard, rice-rapeseed, soybean-wheat, soybean-rapeseed, groundnut-wheat, and groundnut-sunflower by including legumes (moongbean, cowpea, sesbania, pigeon pea) to investigate the role of integrated nutrient management (INM) in harnessing economically-viable sustainable production, enhancing nutritive quality of the produce, improving soil health, and minimizing environmental pollution. Besides growing legumes and short-duration pulse crops in crop rotations, the effects of integrated use of organics (farmyard manure, piggy manure, poultry manure, green manures and crop residues) with chemical fertilizers, and impacts of long-term use of INM on enhancing crop productivity were studied. The results clearly demonstrated that INM enhances the yield potential of crops over and above achievable yield with recommended fertilizers, and results in better synchrony of crop N needs due to (a) slower mineralization of organics, (b) reduced N losses via denitrification and nitrate leaching, (c) enhanced nutrient use efficiency and recovery by crops, and (d) improvements in soil health and productivity, and hence could sustain high crop yields in various cropping systems ensuring long-term sustainability of the system.

Key Words

Food security, nutrient transformations, nitrate and P leaching, greenhouse gases, climate change.

Introduction

One of the most important challenges facing humanity today is to conserve/sustain natural resources, including soil and water, for increasing food production while protecting the environment. As the world population grows, stress on natural resources increases, making it difficult to maintain food security. Long-term food security requires a balance between increasing crop production, maintaining soil health and environmental sustainability. In India, effective nutrient management has played a major role in accomplishing the enormous increase in foodgrain production from 52 million tons in 1951-52 to 230 million tons during 2007-08. However, application of imbalanced and/or excessive nutrients led to declining nutrient-use efficiency making fertilizer consumption uneconomical and producing adverse effects on atmosphere (Aulakh and Adhya 2005) and groundwater quality (Aulakh *et al.* 2009) causing health hazards and climate change. On other hand, nutrient mining has occurred in many soils due to lack of affordable fertilizer sources and where fewer or no organic residues are returned to the soils.

Arid and semiarid subtropical soils of northwestern states of India, developed under harsh climate, are inherently poor in organic matter, fertility and water-holding capacity. In these soils, N, P and S deficiencies are principal yield-limiting factors for crop production. INM, which entails the maintenance/adjustment of soil fertility to an optimum level for crop productivity to obtain the maximum benefit from all possible sources of plant nutrients – organics as well as inorganics – in an integrated manner (Aulakh and Grant 2008), is an essential step to address the twin concerns of nutrient excess and nutrient depletion. INM is also important for marginal farmers who cannot afford to supply crop nutrients through costly chemical fertilizers. This paper summarizes the results of extensive research work carried out with dominant crop rotations of major field crops grown in the subtropical northwestern states of India to investigate the role of INM in harnessing economically-viable sustainable production of prominent cropping systems, enhancing nutritive quality of the produce, improving soil health, and minimizing environmental pollution.

Methods

The subtropical regions of northwestern states of India have summer and winter crop-growing seasons where summer is characterized by high temperature and rainfall (i.e. monsoons); the winter is often dry with low temperature, which is suitable for growing field crops under irrigated conditions. The application of organic manures and raising leguminous crops for green manure (GM) are generally followed in summer crops, as

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tillage and indiscriminate use of irrigation water led to serious soil health problems over the years. have established the benefits of integrated nutrient management (INM) involving use of organic and . sustain high productivity due to. Integrated Nutrient Management for Improving Soil Health and Crop . biological properties and sustaining the cotton productivity in rainfed. Buy Integrated Nutrient Management For Sustaining Crop Productivity And Soil Health on whataboutitaly.com ? FREE SHIPPING on qualified orders. Integrated Nutrient Management For Sustaining Crop Productivity And Soil Health (Hb) Subhash Chand. Soil Quality Affects Agricultural Productivity. 3. 2. Reclaiming Acidic They call for an Integrated Nutrient Management approach to the manage- ment of plant nutrients for . These changes in soil quality affect the health and producticity of the. Integrated nutrient management for sustainable crop production, improving crop quality and soil health, and minimizing environmental pollution. Milkha S. Integrated Nutrient Management For Sustaining Crop Productivity And Soil Health 1st Edition. Fri, 22 Jun GMT Integrated. Sustaining Productivity of Baby Corn Rice Cropping System and Soil Health through Integrated nutrient-management practices improved soil health. Almost . soil lies in good science-based nutrient management be used in an integrated fashion with mineral fertilizers As soils vary in fertility, few can sustain high crop yields indefinitely without application of nutrients. For In terms of effects on soil health, crop production or the environment, there is no conflict between mineral. INM system must take into account the effects of the previous crop on the in sustaining higher crop yields besides improving soil health (Kaushal,). Integrated Nutrient Management (INM) in a Sustainable RiceWheat status and soil health but has also shown greater potential in stabilizing crop yields over . INM system helps to restore and sustain crop productivity, and also assists in checking the compost vermicompost bio-fertilizers soil health crop productivity. Integrated Nutrient Management for Sustainable Crop Production in available P and available K content in soil after three years in potato-sunflower sequence. It thus embraces soil, nutrient, water, crop, and vegetation management water, crops and vegetation to improve and sustain soil fertility and land productivity and provide better quality feed and food, improving animal and human health. sustainable crop production, soil nutrient management and soil stability shall not in any manner lead to the degradation of human health, biodiversity and the problems related to integrated nutrient management were provided by FAO. Long term food security requires a balance between increasing crop production, maintaining soil health and environmental sustainability. maintaining soil health (Ramesh et al) but has low productivity. Adoption of integrated plant nutrient supply and management strategies for enhancing. The book "Integrated Nutrient Management for Sustaining crop Productivity and Soil Health" is a compilation of best integrated nutrient management strategies. best alternative for sustainable crop productivity while maintaining soil fertility Since cropping system serves as a component of INM for sustaining the productivity of the

bio-fertilizers for yield sustainability and improved soil health [8].

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