

Balanced Fertiliser Usage



Recently The Daily Star organized a roundtable on "Balanced Fertilizer Usage" in cooperation with NAAFCO Pvt. Ltd. and with the strategic guidance of Katalyst, which is a project implemented by Swisscontact under the umbrella of the Ministry of Commerce, Bangladesh, co-funded by the UK Government, SDC, and Danida. Here we publish a summary of the discussion --

BALANCED fertilizer usage means application of all the deficient plant nutrients in sufficient amounts, appropriate forms and ratios while maintaining the presence of sufficient organic matter in soil. While presenting the keynote paper on the topic of discussion, Professor Dr. Md. Abdul Kader, Department of Agronomy, Bangladesh Agricultural University, highlighted these facts and also urged the importance of correction of inherent soil nutrient deficiencies, restoring soil fertility, reducing environmental pollution and increasing the yield and quality of crops. He also informed that there is a trend in Bangladesh of indiscriminate use of NPK in vegetables such as potato and yard-long bean. The amount of TSP and MoP used are far less than the recommended rates. Most of the farmers are not using any micronutrients in the soil. The usage of organic manures in the field is also insignificant. It happens that farmers neither follow fertilizer recommendation guide nor do soil test for identifying required amount of fertilizers. They generally use fertilizers based on their experience or follow the practice of neighbor farmers.

He further showed that we do not get adequate amount of fertilizers from our domestic sources. Domestic production of urea has declined substantially over the years. Therefore, a substantial amount of fertilizers, both macro and micronutrients have to be imported. However, due to the inefficient mechanism of distribution and market regulation, the country did not face any fertilizer crisis in the last few years. Farmers are also happy with the price of fertilizers. It was pointed out that there are complaints about adulteration of fertilizers. It mostly happens in non-urea fertilizers like TSP, SSP, gypsum etc. Mixed fertilizer (N-P-K-S) is very good in terms of balanced fertilization, which was widely accepted by the farmers during early 2000. But due to serious adulteration, it is now almost out of market, and farmers have lost interest in it.

In response to the keynote paper, M M Huda, Director, NAAFCO PVT LTD mentioned that agriculture is a neglected sector because it is not so glamorous and farmers' contribution to the nation is often ignored. He added that such regular roundtable initiative would provide the necessary advocacy support to the farmer community who are under-represented in policy making forums and are directly linked with the nation's food security.

Kbd. Chaitanya Kumar Das, Director, Field Services Wing, Department of Agriculture Extension (DAE) highlighted that DAE is in the process of developing an app in cooperation with Ahsania Mission through which a farmer can learn how much fertilizer he needs to use. Regarding adulteration, it was mentioned that mobile courts have achieved some success in preventing fertilizer adulteration however the government alone cannot eradicate this menace and needs to strengthen their cooperation with the private sector in this regard.

In addition, he mentioned that in developed countries there is cultivation of a single crop in a vast agriculture zone. That's why they get good result from using mixed fertilizers. But in our country a farmer cultivates various kinds of crops in a limited agriculture zone. So here the use of mixed fertilizer is not economically viable.

To produce organic fertilizer commercially regular source of organic raw materials is important. Urban waste

has been used for this purpose but it contains high amount of heavy metals.

Further discussions unfolded the fact that 50 percent of the land in Bangladesh suffers from deficiency in organic fertilizer. According to Md. Delwar Hossain Molla, CSO, SRDI, there are two reasons behind this poor condition. First, the concerned individuals do not know what amount of organic fertilizer needs to be applied in comparison with chemical fertilizer. To ensure the right amount of fertilizer, it is necessary to do the soil test of the land, which should be widely popularized in the

country. The second point is that organic fertilizers do not meet the necessary quality. If farmers can properly transform the existing supply of cow dung into vermicompost, its effectiveness will certainly rise. Farmers need to be made aware about these simple but effective solutions and support them with adequate training and technological facilities.

It was also highlighted that in the northern regions, there is a rising tendency of usage of organic fertilizers. It was also stressed that while providing data on fertilizer usage, SRDI needs to update their information regularly because fertility of soil changes continuously. Dr M Shahidul Islam, former DG, BARI, also advised that SRDI requires additional capacity building regarding this issue. They should be able to provide finding of any test in the shortest possible time and must ensure that no recommendation is provided without a soil test.

He reiterated that N-P-K-S is a balanced fertilizer. It was recommended after taking examples from developed countries. We can revise the formula incorporating changes in soil fertility. In today's world no country uses single fertilizer.

Md. Nazamul Hasan, PSO, SRDI said that he has seen in case of M-P-K-S that through subsidy adulteration can be reduced. If the original product is sold at lower price they will not go for adulteration. He informed that proper monitoring system for fertilizer import has been installed but there is no such monitoring for locally produced fertilizers. The Fertilizer Management Act 2006 has stringent provision against adulteration and this Act needs to be implemented.

The Country Director of Haychem (BD) Ltd., Mushfiqur Rahman highlighted that when it comes to imports, there is very little scope of adulteration. As far as ratio of Zink and Sulphar in Zink Sulphate, imported Zink Sulphate has better quality. The locally produced Zink Sulphate contains high amount of heavy metal. This type of adulteration badly deprives the farmers. That's why it is necessary to strengthen the monitoring system in place. In Bangladesh, excessive usage of Urea is common and ultimately attracts more pests, leading to an increase in costs. Hence it was highlighted that balanced fertilizer usage can also reduce pest attacks.

During the discussion, a critical issue was raised by Mir Emdad Ali, Host of Agricultural Programme

Petrochem Sonali Din, ATN Bangla, where he mentioned that there are several types of research being undertaken in various agricultural laboratories. However the findings of these researches are not reaching the farmers, leading to a communication gap between the farmers and researchers.

Dewan Siraj, Host, Mati o Manush, BTW also shared the same view regarding the existing gap between the

research finding in the lab and at the ground level. Dr Md. Abdul Mannan, Professor, Bangabandhu Sheikh Mujibur Rahman Agricultural University discussed about the four R for balanced fertilizer: right source of fertilizer, right rate, right time and right place. It was highlighted that taking the four key factors into consideration can ensure the balanced usage of fertilizer.

On the question of availability of raw materials for organic fertilizer, Yusuf Alam, Product Manager, ACI Fertilizer said that raw materials are not found everywhere which is why it becomes necessary to promote commercial organic fertilizers. He also stressed that the government should give subsidy in this regard. Debraj Agarwala, Annappurna Agro Service recommended that we should give highest priority to organic fertilizer. But since that is not the case, there is a rise in the usage of chemical fertilizer. Chemical fertilizer is also a major source of carbon emission. He informed that in India, they have various government programmes to subsidize organic fertilizer production projects both at the entrepreneur and farmers level. But in Bangladesh there is no such support. As a result a large amount of raw materials for organic fertilizers are wasted. He hoped that the authorities concerned would come forward in support of organic fertilizer.

According to Iftekhar Mahmud, Reporter, Prothom Alo, it is essential to monitor whether crop rotation and ecological zoning are working properly. Addressing these two issues can lead to the reduction of chemical fertilizer usage.

Moreover, the Host of Agricultural Programme Sabuj Bangla, GTV, Bayezid Moral advocated that there are teachers for agricultural department in the local level colleges, who can give suggestion to the farmers about the balanced usage of fertilizer.

A senior journalist specializing in agriculture reporting, Reaz Ahmed of The Daily Star was also present during the discussion. He presented the facts that in Bangladesh, cropping intensity is the highest in the world. It signifies how much soil mining Bangladesh is currently doing, which consequently brings forth the issue of balanced use of fertilizer. He also pointed out the issue of governance in fertilizer sector. Jessor's Noapara has been a problem for many years but no government could do anything about it. Adulteration is also going on in other places in the country. He suggested government should ensure that a farmer does not get cheated by buying adulterated fertilizer.

Food production is a function of crop yield, number of crops per year, and cultivated area. A sustainable food production implies that available resources are used as efficiently and equitably as possible, resources in this respect meaning:

Natural resource - the availability of suitable agricultural land, fresh water, nutrients and energy

Technology - genetic improvements of crops and animals, plant protection, irrigation, machinery and equipment, access to cheap and reliable transport

Knowledge - its generation, maintenance, transfer and adaptation into agricultural management practices

To keep food production at levels matching population growth, assuming no increase of productive land by leasing or colonization, the future challenges will be to increase yield per unit, maintain soil productivity, better resource management, eg water-use efficiency, breeding new crop varieties, increasing research and farmer advisory services, all in the backdrop of climate change. The keystone is balanced soil and plant nutrition.

The writer is Director, NAAFCO (PVT) LTD

RECOMMENDATIONS

1. The present policy of fertilizer marketing and distribution is working satisfactorily under highly regulated Government control, and this policy should be continued.
2. The price of micronutrients is high. There should be some incentives or subsidy to encourage farmers to use micronutrients fertilizer.
3. To check fertilizer adulteration, strong monitoring system needs to be implemented for imported non-urea fertilizers (TSP, DAP and MoP). Strong action should be taken against persons or companies involved in fertilizer adulteration.
4. Farmers need to be motivated for balanced usage of fertilizers through training, field demonstration and motivational programmes. Media should be involved more in awareness building in this regard. The facilities for testing soil fertility through SRDI should be strengthened and it should be made available to the farmers locally. Soil mini-labs should be established in each Upazilla. We should encourage our farmers to prepare and use organic manures like cow dung, compost, poultry manure, vermin-compost, green manure etc.

Balanced fertilization: Food for thought

M. M. HUDA

"AND he gave it for his opinion, that whosoever could make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more for his country, than the whole race of politicians put together."

-- Gulliver's Travels, JONATHAN SWIFT

"Upon this handful of soil our survival depends.

Husband it and it will grow our food, our fuel and our shelter and surround us with beauty.

Abuse it and the soil will collapse and die taking man with it."

--VEDAS

Plants form complex organic matter from carbon dioxide in the air, energy from sunlight, and water and nutrients taken from the soil. Balanced nutrition is one of key components of sustainable agriculture. Fourteen elements are indispensable for plant nutrition and divided into 3 subgroups: macro or primary nutrients, nitrogen (N), phosphorus (P), potassium (K); major or secondary nutrients, calcium (Ca), magnesium (Mg), sulphur (S);

micronutrients or trace elements, eight other elements.

Focusing on the three major elements, a crude analogy can be drawn with human nutrition. Just as how we need to consume carbohydrates, proteins and fats in certain ratios ie too much carbohydrate or protein or fat results in imbalance, likewise the plant must uptake N, P, K in balance. These 3 primary elements are the usual crop yield-limiting factors, although given our geology there are also widespread sulphur and zinc deficiencies. Crops need all the nutrients in sufficient amounts, although an excess of some of the elements may be toxic to plant. Crop yield will be limited by whichever nutrient is least available eg if K is only 50% present, then yield will be limited to 50% regardless of all other nutrients being 100% available. This is a simplistic expression of the 'law of the minimum'

Nutrients come from soil reserves, animal manure, green manure and plant residues, biological nitrogen fixation through soil bacteria, irrigation water and aerial deposition, and mineral fertilizers.

Soil health is not just about the import and export of nutrients, the organic matter levels have to be maintained with soil structure and humus content. This allows a healthy environment for soil organisms, optimises nutrient

and water-holding capacities, and provides important buffering against sudden changes in soil acidity. The science of soil is incredibly complex with the interactions between nutrients, water, air, and organic content, still not fully understood.

What we do know is the first step to ensuring crop yields is to follow the 'law of the minimum' with respect to the primary elements and then figure the next limiting factors through trial, research and observation. Without balanced fertilization, farming becomes inefficient and valuable resources such as labour, water, nutrients, power/fuel are literally thrown away and long term soil health undermined. Proper plant nutrition also ensures a quality produce which may give better farmer incomes and also better diets to consumers. Healthier plants are less susceptible to diseases which may lower the need for plant protection products.

Since 1971, the population of Bangladesh has doubled and food production has matched this both quantitatively and qualitatively too, with a greater variety of food items. There also has been tremendous growth in production of animal protein through the poultry and fishery sectors. All feed for animals and food for humans originate from plants.

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