Enhancement in the productivity of maize (Zea mays L) through integrated balanced nutrient management in Banswara district

Ranjeet Singh, Teekam Singh and R.L. Soni

Krishi Vigyan Kendra, MPUAT, Banswara (Rajasthan)

ABSTRACT

The rabi maize productivity is low in Banswara district of Rajasthan. Farmer’s of the Banswara district are not completely following the package and practices viz., fertilizer management in rabi maize. To convince the farmer’s of the area about the use of balanced nutrition to crops, on farm testing at farmer’s field of integrated nutrient management on the productivity of maize was conducted for two consecutive years 2007-08 and 2008-09 in village Jantoda and Khandadera. The grain yield was increased with the tune of more than 50 per cent with the application of integrated nutrient over the existing farmer’s practice of nutrient management. The B:C ratio of INM was found higher (1.32) as compared to farmer’s practice of nutrient management (1.01).

Key words: Grain yield integrated balanced nutrient management, B:C ratio.

Banswara is the tribal dominated district of Rajasthan. The socio economic condition of the farmers does not permit them to adopt any new technology there by resulting in low yield of crops which is one of the major reason responsible for low productivity of maize due to lack of supply of balance nutrition to the crop even though soil is low to medium in its inherent fertility. Therefore, a need was to initiate on farm testing at farmer’s field to study the effect of integrated application of nutrients in balanced proportion on the productivity of rabi maize to convince the farmers for adoption of the integrated balance nutrient management in rabi maize for enhancing its productivity.

MATERIALS AND METHODS

On Farm Trials were conducted for two consecutive year 2007-08 and 2008-9 during rabi season in village Jantoda and Khandadera in Banswara district of Rajasthan which comes under the southern sub hummid plain Zone IV B of Rajasthan. The soil of the studied area was clay with pH values ranging from 6.9 to 7.6, low in organic carbon, available phosphorus and medium to high in available potassium. The trials were consisted with three treatments viz:

- **T₁** - Farmers practice (110:60:0 kg N, P₂O₅ and K₂O/ha)
- **T₂** - General recommended doses of fertilizers (150:60:0 Kg N, P₂O₅ and K₂O/ha) with FYM 5 t/ha + use of bio fertilizers and
- **T₃** - Integrated balanced nutrient management based on soil test value (150:60:30 Kg N, P₂O₅ and K₂O/ha) with vermicompost @ 5 t/ha + use of bio fertilizer) were tested in a randomized block design with 4 replications. Each trial at farmer's field was considered as a replication accommodating all the three treatments. Every year the crop was sown in the month of November. Treatment consisting of FYM, vermicompost and inorganic fertilizers, entire FYM, vermicompost, P₂O₅ and K₂O and 33% N were applied at the sowing time and remaining nitrogen was applied in two splited doses, 33% N was top dressed at knee high stage and rest 33% N was top dressed at silking stage of the crop in the field. The seed was also treated with Azospirillum and PSB culture at the sowing time.
RESULTS AND DISCUSSION

Grain yield of rabi maize was influenced by the balanced application of nutrients treatments in both the years. The grain yield increased from 13.42 to 18.74 q/ha in 2007-08 and 35.31 to 44.41 q/ha in 2008-09 with application of general recommend dose of fertilizers (Table 1) over farmer’s practice of nutrient management. The increase in grain yield was in the order of 39.64 per cent in 2007-08 and 25.79 per cent in 2008-09. Use of integrated balanced nutrients on soil test basis increases the grain yield with tune of 22.28 q/ha in 2007-08 and 51.23 q/ha in 2008-09 which were significantly higher than application of general recommended doses of fertilizers. These results are in close conformity with earlier findings of Sahoo and Panda (2000) & Desai et al (2009). The B:C ratio followed the same trends that of grain yield. The highest B:C ratio 1.32 was obtained with integrated balanced nutrient management based on soil test value. Superiority of T3 treatment over T2 and T1 was obviously due to availability of NPK in balanced proportion which helps in better growth and development which ultimately leads to higher yield.

Results of this on farm testing indicated that in the Banswara district of Rajasthan (Zone IV B), farmers should apply 150 KgN, 60 kg. P2O5 and 30 Kg K2O/ha with vermicompost @5t/ha and use bio fertilizers in order to improve productivity of rabi maize and there by making maize cultivation quite remunerative in the region. This on farm testing trial was conducted at farmer’s field with the aim of learning by doing. All operations from sowing to harvesting was done by farmers themselves in collaboration with scientists. Other farmers of the village saw the experiment and appreciated the results of integrated balanced nutrient management over recommended doses of fertilizers and farmers existing practice of nutrient management.

Table 1. Effect of integrated balanced nutrient management on yield and net profit of maize in farmer’s field

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Grain yield (q/ha)</th>
<th>Net return (Rs./ha)</th>
<th>B:C ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007-08*</td>
<td>2008-09</td>
<td>Average</td>
</tr>
<tr>
<td>T1 - Farmer’s practice (110:60:0 Kg N, P2O5 and K2O/ha)</td>
<td>13.42</td>
<td>35.31</td>
<td>24.36</td>
</tr>
<tr>
<td>T2 - General recommended doses of fertilizers (150:60:0 Kg N, P2O5 and K2O/ha) with FYM 5 t/ha + use of bio fertilizers</td>
<td>18.74</td>
<td>44.41</td>
<td>31.57</td>
</tr>
<tr>
<td>T3 - Integrated balanced nutrient management based on soil test value (150:60:30 Kg N, P2O5 and K2O/ha) with vermicompost @5 t/ha + use of bio fertilizers</td>
<td>22.28</td>
<td>51.23</td>
<td>36.75</td>
</tr>
</tbody>
</table>

*Low yield due to abbrent weather condition especially low temperature during growth period of the crop.
References
