

## Proper INM enhances kachri yield

Under hot arid agroclimate where soil is low in organic matter and available plant nutrients are of great importance in increasing yield by the balanced plant nutrients supply. The combined application of 50% recommended dose of NPK (40 kg N + 20 kg of  $P_2O_5$  + 20  $K_2O$ ) along with 15 t/ha FYM (in channel or in line where seed is grown) give higher yield (113.08 q/ha). Besides more yield, this combination also showed increasing efficiency, net return and B:C ratio. At this proportion inorganic sources maintained the availability of nutrients at a rate at which crop did not suffer stress. At the same time organic sources maintained the balance nutrition to crop for a longer duration. This proportion also favoured mineralization of organic source at desirable rate to maintain supply of nutrients to kachri crop.

To achieve nutrition and income security for people, particularly in hot arid region of north-western parts of Rajasthan, suitable crop-plant species from vegetables are of vital importance. The native crops like kachri support livelihood in the hostile situations, where vegetable crop diversification is not much feasible. However, limited attention was paid for its nutrient management and other crop production aspects. Kachri requires hot and dry climate and a long growing season preferably with warmer days for cultivation both in rainy and summer season crop. The high temperature and dryness conditions are beneficial for crop, fruit maturity and quality and are also best for dehydration of kachri fruits.

### INM in Kachri

Fertilizers constitute 18-22% costs of cultivation in kachri. Fertilizer costs are rising every year. Therefore, it is important to maximize use of locally available organic nutrient sources to maintain soil

fertility and productivity. The use of inorganic fertilizer in conjunction with organic manures is essential for getting sustainable and profitable yield of kachri. Since, application of inorganic fertilizers alone could not sustain soil fertility and productivity under cropping sequences, the only way to realize the potential yield of crops on sustained basis is through use of various sources of nutrients in integrated manner to make the system productivity profitable.

Nutrients requirement of kachri differ with soil, climate, cultivar and growth period. Nutrients use efficiency is low in kachri in hot arid region. So, there is a need to apply nutrient management techniques. Integrated nutrient management (INM) implies most efficient use and management of organic and inorganic sources of nutrients to attain higher levels of kachri productivity along with maintaining the fertility of soil in arid region.

Kachari variety, AHK-119, was sown with hand plough at spacing 2 m × 50 cm row-to-row and plant-

**Table 1.** Effect of organic and inorganic source of nutrient on yield of kachri

Treatment	Yield (q/ha)	Average weight of fruit (g)	Dry matter (%)	Dry matter yield (q/ha)
Control	68.71	26.13	8.16	5.60
100% (I)	87.89	34.06	8.69	7.64
75% (I)+7.5 t/ha FYM	104.00	36.25	8.79	9.15
50%(I)+ 15 t/ha FYM	113.08	38.78	9.81	11.09
25%(I)+ 22.5 t/ha FYM	93.27	37.00	9.98	9.31
30 t/ha FYM	91.19	34.78	8.99	8.19
SEm±	4.86	1.98	0.4	0.46
CD at (5%)	14.88	6.03	1.29	1.44





INM under sprinkler irrigation at farmer's field



INM in Kachri under drip irrigation

to-plant distance. The recommended dose of fertilizer was 80 kg N+40 kg of  $P_2O_5$  +40  $K_2O$  /ha, was applied and  $P_2O_5$  and 40  $K_2O$  was given as basal dose through single superphosphate and muriate of potash. Nitrogen dose was applied in three splits, i.e. one-third at sowing, one-third at 25 DAS and the rest one-third 50 DAS from fertilizers and FYM was applied as per treatment in furrows (channel technology) at the sowing time.

#### Yield with INM

The yield of *kachri* increased as compared to the control (Table 1). Integration of organic and inorganic sources at equal proportion (application of 50% NPK from inorganic fertilizers and 15 t/ha FYM) gave highest *kachri* yield (113.08 q/ha) which was significantly higher than all other treatments. The increase in total yield was 28.66% over recommended NPK through fertilizers. Application of 100% NPK through FYM also increased yield significantly by 32.71% compared to the control. This treatment gave only 5.12% more fruit yield as compared to recommended dose of fertilizers. Other treatments 25, 75 or 100% of NPK were applied

through organic sources were better than the control but inferior to 50% replacement and *at par* with other treatments. In dry matter yield (q/ha), dry matter yield, average weight of fruit (kg) and fruit yield was same trend as observed in yield.

Table 2. Net return with benefit : cost ratio

Treatment	Yield (q/ha)	Cost of cultivation	Gross return (₹/ha)	Net return (₹)	Benefit:Cost ratio
Control	68.71	33,000	137,429	104,429	3.16
100% (I)	87.89	37,073	175,770	138,697	3.74
75% (I)+7.5 t/ha FYM	104.00	37,255	208,008	170,753	4.58
50% (I)+ 15 t/ha FYM	113.08	37,437	226,152	188,715	5.04
25% (I)+ 22.5 t/ha FYM	93.27	37,618	186,533	148,914	3.96
30 t/ha FYM	91.19	37,800	182,377	144,577	3.83

I = NPK applied through fertilizers



Kachri 119



Intercropping in Kachri





**Kachri yield**

### Yield

Maximum per cent yield response was observed where 50% (I) + 15 t/ha FYM was applied (64.57%), followed by 75% (I) + 7.5 t/ha FYM (54.37%) as compared to the control. This may be due to more partitioning of dry matter to *kachri* as a result of balance nutrition in the treatment receiving FYM application.

The net return from *kachri* followed similar trend (Table 2) as that of fruit yield with highest values of ₹1,88,715/ha was observed in 75% inorganic NPK + 15 t/ha FYM treatment, followed by 75% NPK+ 7.5 t/

ha FYM (₹170,753/ha) and 25% inorganic NPK along with 22.5 t/ha FYM (₹148,914/ha). FYM application gave net return of ₹144,577/ha as compared to control (₹ 104,429/ha). The benefit: cost ratio was highest in treatment receiving 50% inorganic NPK + 15 t/ha FYM (5.04), followed by 75% NPK+ 7.5 t/ha FYM treatments (4.58), whereas control gave the lowest B:C ratio (3.16).

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– Editor

