

## Technology 5: Integrated Nutrient Management for Oilseeds

Results of more than 300 on-farm trials in 9 target districts across 7 states of the country on different rainfed oilseed based cropping systems at different agro-ecosystems, conducted over 3 years, clearly show that:

- (1) Application of recommended doses of fertilizers (RDF) can significantly boost up the yield of oilseed crops as well as net return over the existing practice of farmers on nutrient management. The yield increase varied from 0.48 q/ha in case of sunflower in Latur to 2.80 q/ha in case of groundnut in Ranchi (Table 1).
- (2) Introducing soil moisture conservation treatments resulted significant increase in yield and net return, particularly in sunflower in Latur, safflower in Parbhani and castor in Palem.
- (3) Integrated nutrient management involving different sources of organic manure has been found to maximize yield as well as income in different oilseed based cropping systems (Table 2). Application of FYM in soybean-chickpea system and in fallow-sunflower system; lime along with FYM in groundnut + pigeonpea intercropping system; green manuring in safflower, castor and mustard has been found beneficial in increasing yield as well as income over farmers practice as well as RDF.

Table 1: Economics of the cropping system

Cropping system	Additional return* due to RDF	Additional return* due to best INM
Soybean - Chickpea	3832	6121
Greengram - Safflower	601	3066
Fallow - Sunflower		
At Latur	403	2395
At Raichur	1993	3269
Groundnut + pigeonpea	11446	16669
Castor monocropping	954	1450
Fallow-Mustard	2543	4283
Maize-Raya	764	2594

\* With respect to farmers practice

**Table 2: The most beneficial INM recommendation for the cropping systems**

<b>Cropping systems</b>	<b>Most beneficial INM treatment</b>	<b>Additional return due to best INM (Rs) over farmers' practice</b>
Soybean – chickpea system	100% RDF + 2 t/ha FYM to soybean and 50% RDF to chickpea RDF of soybean:20 kg N, 25 kg P through Urea and SSP;RDF of chickpea: 30 kg N, 25 kg P/ha through Urea and SSP	6121
Green gram-safflower system	Incorporation of greengram stalk before sowing of safflower along with 75% RDF of safflower + Soil moisture conservation measure (Summer ploughing and inter-culture with blade hoe) RDF of safflower = 40 kg N : 20 kg P /ha	3066
Fallow – sunflower system at Latur	100% RDF+FYM @ 2 t/ha +Soil moisture conservation measure (Opening furrow after every 6 rows) RDF = 60 kg N: 40 kg P: 40 kg K /ha.	2395
Fallow – sunflower system at Raichur	100% RDF+FYM @ 2 t/ha +Soil moisture conservation measure (Opening furrow after every 2 rows) RDF = 60 kg N: 40 kg P: 40 kg K /ha.	3269
Castor monocropping	Cowpea incorporation after first picking and 75% RDF of castor RDF = 60 Kg N: 40 Kg P: 30 Kg K: 20 Kg S /ha	1450
Groundnut – pigeonpea intercropping system	100% RDF + lime @2 t/ha + FYM@2 t/ha + Soil-water conservation measure (furrows between groundnut and pigeonpea rows) RDF = 10 kg N: 20 kg P: 15 kg K /ha for both the crops.	16669
Fallow-mustard system	Green manuring with Sesbania and FYM @ 2 t/ha + 75% RDF RDF = 80 kg N: 40 kg P: 20 kg S /ha.	4283
Maize – Raya system	100% RDF + S @ 20 Kg/ha + Soil moisture conservation Measures (summer ploughing + maize residue application on surface) RDF = 80:40:0 Kg N:P:K /ha (maize); 37:20:0 Kg N:P:K/ha (raya)	2594

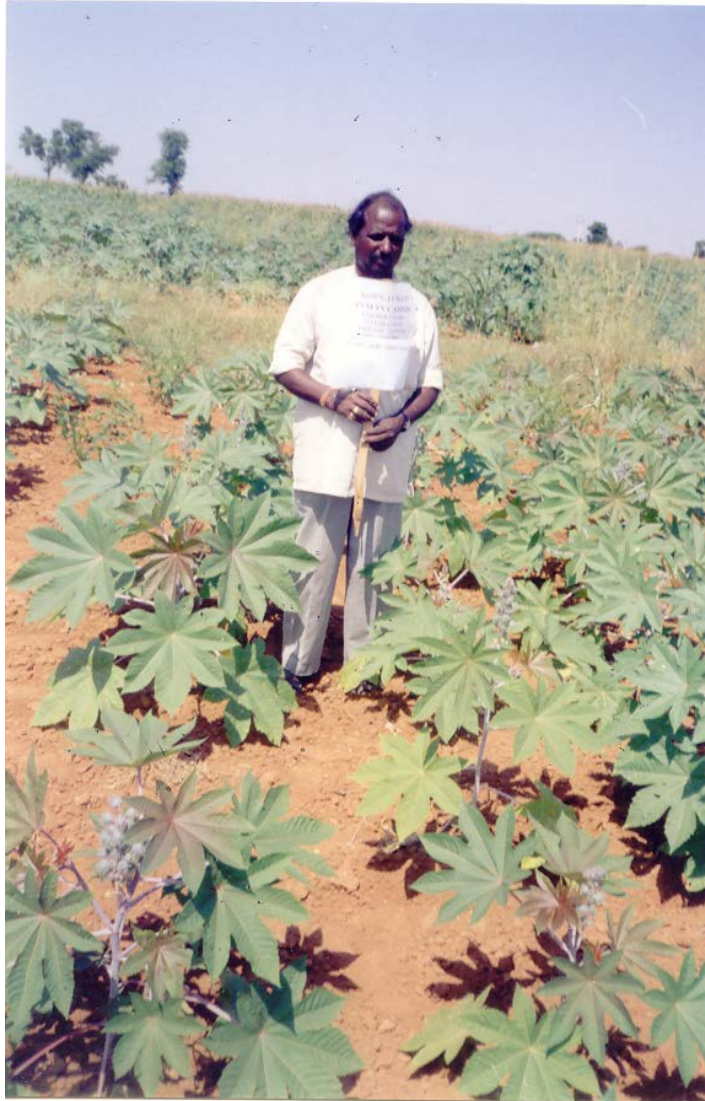
Village:Shakawadi Dt. Raichur



Farmers Practice

RDF

**Better crop growth and height of sunflower crop due to more application of fertilizer in RDF treatment at village Shakawadi (Raichur), Karnataka**



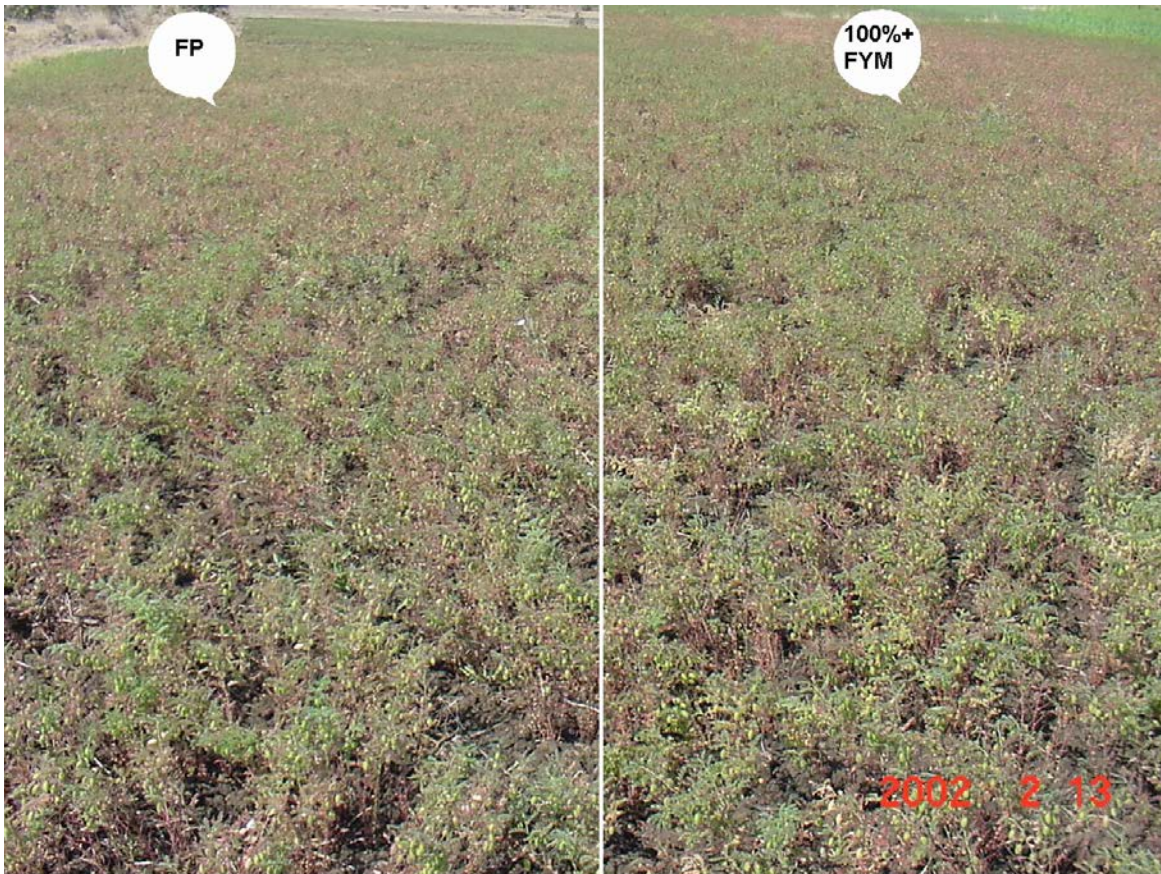
**Poor castor crop growth in farmers practice at Vattem village of Mehboobnagar district, A.P.**



**Better castor crop growth due to 75% cowpea incorporation (T4) at Vattem v**



**Vigorous mustard crop growth in best INM treatment plot at Bharatpur**



**Growth of chickpea in 100% RDF + FYM to soybean and 50% RDF to chickpea (T3) treatment in comparison to farmers' practice treatment (T1) Technology 5: Sulphur Management for Oilseed and Pulse Crops**

Sulphur (S) deficiency is widespread in areas under oilseeds and pulses. Visible symptoms of S deficiency in most of the oilseed and pulse crops appear on young foliage in the form of pale chlorotic leaves, thin slender stems, stunted growth, poor branching, and bushy appearance. On an average, 41 per cent Indian soils are deficient in S and it is widespread in coarse textured alluvial, red and laterite, leached acidic and hill soils and black clayey soils.

- Regular use of 40 kg S ha<sup>-1</sup> to soybean, groundnut, mustard, gobi sarson, raya, safflower, castor, and 20 kg S ha<sup>-1</sup> to sesame, linseed, niger was found optimum.
- Among pulses, chickpea, field pea, pigeon pea require 40 kg S ha<sup>-1</sup>, while lentil, green gram, black gram and cluster bean needs 20 kg S ha<sup>-1</sup> to produce optimum crop yield.
- Application of 20-40 kg S ha<sup>-1</sup> gave economic seed response of 204 to 640 kg ha<sup>-1</sup> in oilseed crops, and 176 to 592 kg ha<sup>-1</sup> in pulse crops amounting to Rs.9/- to 82/- benefit for each rupee spent on S.