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# Influence of Integrated Weed Management Practices and Bio-Fertilizers an Economic Appraisal of *Kharif* Soybean [*Glycine max (L.) Merill*] in Southern Telangana

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**ABSTRACT**

A field experiment entitled "Influence of integrated weed management practices and bio-fertilizers an economic appraisal of *kharif* soybean [*Glycine max (L.) Merill*] in southern Telangana agro- climatic zone" was conducted at the Agricultural College farm, Rajendranagar. Hyderabad,Telangana State during 2014 and 2015. Hand weeding twice at 25 and 45 DAS was the most profitable treatment (Table 4.22). It accrued maximum net profit of Rs 58,574 $ha^{-1}$ and Rs 1.95 $Re^{-1}$ during 2014 and Rs 60,290 $ha^{-1}$ and Rs 2.08 $Re^{-1}$ during 2015 followed by application of pendimethalin @ 1.0 kg *a.i* $ha^{-1}$ hand weeding at 25 DAS fetched net returns of Rs 56,348 $ha^{-1}$ and Rs 2.00 $Re^{-1}$ during 2014 and Rs 57,965 $ha^{-1}$and Rs 2.14 $Re^{-1}$ during 2015, respectively with lower cost of cultivation of Rs 28,144, and 27,144 $ha^{-1}$. Among fertilizer treatments recommended fertilizer with Phosphorus and Potassium solubulizing bacteria (Rs.52,194 and Rs 2.31 $Re^{-1}$) and fertilizer with Phosphorus solubulizing bacteria (Rs. 51,349 and Rs 2.30 $Re^{-1}$) during first year and (Rs. 53,659 and Rs 2.38 $Re^{-1}$) and fertilizer with Phosphorus solubilizing bacteria (Rs. 52,363 and Rs 2.35 $Re^{-1}$) during second year, respectively.

Key words*: Bio-Fertilizers, Economic Appraisal , Integrated Weed Management Practices.*

Soybean [*Glycine max (L.) Merill*] is a miracle golden bean of the 20th century. It occupies third place among oilseed crops of Telangana State. It is a rich source of protein (40-42 %) and quality oil (20-22%). Protein is rich in valuable amino acid with 5% lycine. It also contains good amount of minerals, salts and vitamins. Weeding should be done during a short period of 3-4 weeks after sowing the crop. This will eliminate or minimize the crop-weed competition during the critical phase of 4-6weeks ( Gethe *et al.*,2011 and Peer *et al*.,2013) . Use of growth promoting rhizobacteria including phosphate and potassium solubulizing bacteria maintains biochemical, metabolic functions in plants and also maintains soil fertility and soil health but lower phosphorus use efficiency limits crop yield and economic returns. The post emergence treatment of herbicides were less expensive to cultivate but also less profitable. In events of labour scarcity, the integrated weed management is the most viable option. If labour availability is extremely difficult the combined application of pre-emergence herbicides and a post emergence herbicide will fetch him good returns The addition of bio-fertilizers with an meager addition expenditure will fetch good economic returns

## MATERIAL AND METHODS

A field experiment entitled "Influence of integrated weed management practices and bio-fertilizers on Economic Appraisal of *kharif* soybean [*Glycine max (L.) Merill*] in southern Telangana agro- climatic zone"was conducted at the Agricultural College Farm, Rajendranagar, hyderabad during 2014 and 2015. The soil was sandy loam in texture having 7.8 pH and EC 0.21 d S $m^{-1}$. It was very poor in nutrient status with 0.35% OC and 226 kg $ha^{-1}$ available N, available P was 18 kg $ha^{-1}$and available K was 236 kg $ha^{-1}$. The layout was a split plot design. The main treatments were : (W1) Pre-emergence application of pendimethalin @ 1.0 kg a.i $ha^{-1}$ followed by hand weeding 25 DAS, (W2) Pre emergence application of pendimethalin @1.0 kg a.i $ha^{-1}$ followed by post-emergence application of imazethapyr @ 100 g a.i $ha^{-1}$+ quizalofop-p-ethyl @ 50 g a.i $ha^{-1}$ 25DAS, (W3) Pre–emergence application of pendimethalin

@1.0 kg a.i ha$^{-1}$ followed by post-emergence application of odyssey i.e. imazethapyr + imazamox@ 70 g a.i ha$^{-1}$ at 25 DAS, (W4) Hand weeding at 25 and 45 DAS and (W5) un-weeded check. The sub plot treatments comprising of (F1) Recommended dose of fertilizers @ 30:60:40 kg ha$^{-1}$ NPK, (F2) RDF+ seed treatment with rhizobium @ 250g10kg$^{-1}$seed, (F3) RDF+seed treatment with rhizobium @ 250g10kg$^{-1}$ seed + phosphate solubilizing bacteria @ 5 kg ha$^{-1}$ , (F4) RDF + seed treatment with rhizobium @ 250 g10 kg$^{-1}$ seed + phosphate solubilizing bacteria @ 5 kg ha$^{-1}$ + potassium solubilising bacteria@ 5kg ha$^{-1}$. Recommended fertilizer dose of 30:60:40 kg ha$^{-1}$ NPK was calculated for the dimensions of each sub plot and applied at the time of sowing in the form of urea. Single super phosphate and muriate of potash. Seed rate was @ 63 kg ha$^{-1}$. The bio fertilizers- *brady rhizobium japonica* and phosphate solubilising bacteria were mixed as per the treatment in jaggery solution prepared @ 250 g for 10 kg seed. The seed was thoroughly mixed with the solution and shade dried. The potassium solubilising bacteria were applied @ 5 kg ha$^{-1}$ after mixing with FYM. The seeds were dibbled at the rate of two per hill 10 cm apart in 30cm interval. The crop was sown on 10$^{th}$ July in 2014 and 18 $^{th}$ June in 2015.

## RESULTS AND DISCUSSIONS

The results obtained in the field experiment entitled"Influence of integrated weed management practices and biofertilizers on chlorophyll content of *kharif* soybean [*Glycine max (L.) Merill*] in southern Telangana agro- climatic zone". Hand weeding twice at 25 and 45 DAS was the most profitable treatment (Table 4.22 ) It accrued maximum net profit of Rs 58,574 ha$^{-1}$ and Rs1.95

Table. Economics as Influenced by weed management treatments and bio-fertilizers during 2014 and 2015.

| Treatment | 2014 | | | | 2015 | | | |
|---|---|---|---|---|---|---|---|---|
| | Cost of Cultivation Rs ha$^{-1}$ | Gross returnsRs ha$^{-1}$ | Net returns | | Cost of Cultivation Rs ha$^{-1}$ | Gross returns Rs ha$^{-1}$ | Net returns | |
| | | | Rs ha$^{-1}$ | Rs Re$^{-1}$ | | | Rs ha$^{-1}$ | Rs Re$^{-1}$ |
| W1:PE Pendimethalin @ 1kg *a.i* ha$^{-1}$ fb Hand weeding at 25DAS | 28144 | 84492 | 56348 | 2.00 | 27144 | 85109 | 57965 | 2.14 |
| W2:PE Pendimethalin @ 1kg *a.i* ha$^{-1}$fb PoE Imazethapyr @100g *a.i* ha$^{-1}$ +Quizalofop- P-ethyl @ 50g *a.i* ha$^{-1}$ 25DAS | 27809 | 72400 | 44591 | 1.60 | 27809 | 74219 | 46410 | 1.67 |
| W3:PE Pendimethalin @ 1kg *a.i* ha$^{-1}$fb PoE Imazethapyr + Imazamox @70 g *a.i* ha$^{-1}$25 DAS | 26502 | 72855 | 46353 | 1.75 | 26502 | 74223 | 47721 | 1.80 |
| W4:Hand weeding at 25 and 45 DAS | 29994 | 88568 | 58574 | 1.95 | 28994 | 89284 | 60290 | 2.08 |
| W5: Unweeded check | 20744 | 42680 | 21936 | 1.06 | 20744 | 43287 | 22543 | 1.09 |
| F1:Fertilizers @ 30:60:40 kg ha$^{-1}$ N:$P_2O_5$:$K_2O$ | 21994 | 69064 | 47070 | 2.14 | 21994 | 70087 | 48093 | 2.19 |
| F2:F1 + Rhizobium @ 250g10 kg$^{-1}$ seed | 22069 | 71261 | 49192 | 2.23 | 22069 | 71870 | 49801 | 2.26 |
| F3:F2 + Phosphate solubilising bacteria @ 5 kg ha$^{-1}$ | 22319 | 73668 | 51349 | 2.30 | 22319 | 74682 | 52363 | 2.35 |
| F4:F3+ Potassium solubilising bacteria @ 5 kg ha$^{-1}$ | 22569 | 74763 | 52194 | 2.31 | 22569 | 76228 | 53659 | 2.38 |

$Re^{-1}$ in 2014. The profit was Rs 60,290 $ha^{-1}$ and Rs 2.08 $Re^{-1}$ during 2015.The cost of cultivation was Rs 29,994 $ha^{-1}$during 2014 and 28,994 $ha^{-1}$ during 2015. The integrated weed management by the pre-emergence application of pendimethalin @ 1.0 kg *a.i* $ha^{-1}$ followed by hand weeding at 25 DAS also fetched almost similar profit of Rs 56,348 $ha^{-1}$ and Rs 2.00 $Re^{-1}$ during 2014. The profit was Rs 57,965 $ha^{-1}$ and Rs 2.14 $Re^{-1}$ during 2015. The expenditure was Rs 28,144 $ha^{-1}$ during 2014 and 27,144 $ha^{-1}$ during 2015. The post emergence treatment of herbicides were less expensive to cultivate but also less profitable. In events of labour scarcity, the integrated weed management is the most viable option. If labour availability is extremely difficult the combined application of pre-emergence pendimethalin @1.0 kg *a.i* $ha^{-1}$ and post emergence application of odyssey @ 70 g *a.i*
$ha^{-1}$ 25 DAS fetched net returns of Rs 46,353 $ha^{-1}$ and Rs 1.75 Re-$^{1}$ during 2014.The profit was Rs 47,721 $ha^{-1}$and Rs 1.80 $Re^{-1}$ with low expenditure of Rs 26,502 $ha^{-1}$ during both the years. Still this is twice the profit of Rs 21,936 during 2014 and 22,543 $ha^{-1}$ during 2015 from the un-weeded crop. High profit $ha^{-1}$ and $Re^{-1}$ investment were recorded by different weed control treatments in several studies in the past (Chauhan *et al*., 2002; ).

The addition of bio-fertilizers with an addition expenditure of Rs 575 $ha^{-1}$ fetched net profit of Rs 52,194 $ha^{-1}$ over the application of fertilizers in 2014.The net profit $Re^{-1}$ also increased from 2.14 to 2.31. In consonance to this trend, the bacterial inoculation of these N P K releasing materials increased the net profit from Rs 48,093 to Rs 53,659 $ha^{-1}$ and from Rs 2.19 to 2.38 $Re^{-1}$ during 2015. Considering additional income of Rs 5,124 $ha^{-1}$ during 2014 and Rs 5,566 $ha^{-1}$ during 2015 by the expedition of addition of these organic cultures worth Rs 575 $ha^{-1}$ farmer get high returns. Singh (2007) observed that the cultivation expenses were less due to recommended dose of fertilizer application while maximum net returns were realized by the inoculation of *Rhizobium* and *Pseudomonas* with 5 t $ha^{-1}$ FYM and fertilizer application to soybean.

## LITERATURE CITED

**Chauhan V S, Bhargava M K and Jain V K 2002** *Effect of herbicides on weeds and soybean (Glycine max(L.) Merril). Indian Journal of Weed Science,* 34 (3&4) : 213-216.

**Peer F A, Badrul Hassan, Lone B A, Sameera Qayoom, Latief Ahmad, Khanday B A and Purshotam Singh 2013** *Effect of weed control methods on yield and yield attributes of Singh and Gurdeep Soybean. African Journal of Agricultural Research,* 8(48): 6135-6141.

**Gethe R M, Dingre S K, Pawar D D and Sonawane S V 2011** *Effect of weed management on soybean (Glycine max (L.) Merrill) .Bioinfolet,* 8 (3): 278-279.

**Singh G 2007** *Integrated weed management in soybean (Glycinemax). Indian Journal of Agricultural Sciences,* 77**:** 675-676.

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