



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(1): 1192-1193
Received: 25-11-2018
Accepted: 27-12-2018

Anuj Roshan Toppo
Indira Gandhi Krishi
Vishwavidyalaya, Raipur
Chhattisgarh, India

Dogendra Kumar Sahu
Sam Higginbottom University of
Agriculture, Technology and
Sciences, Allahabad, Uttar
Pradesh, India

Ravi Ranjan Sahu
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

Radhika Bai
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

Punam Lal Kerketta
Department of Soil Science and
Agricultural Chemistry, Indira
Gandhi Krishi Vishwavidyalaya,
Raipur, Chhattisgarh, India

Smita Bala Barik
Department of Horticulture,
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

Effect of integrated weed management on biological properties of soil, crop growth and productivity of soybean

Anuj Roshan Toppo, Dogendra Kumar Sahu, Ravi Ranjan Sahu, Radhika Bai, Punam Lal Kerketta and Smita Bala Barik

Abstract

A Field experiment was conducted during *kharif* season of 2010 at Research cum Instructional farm, IGKV, Raipur (C.G.) to know the effect of district weed management practices growth, productivity of soil. Result reveals that hand weeding twice at 20 and 40 DAS was equally effective with wheel hoeing to productivity of soybean. Rhizobial population was also found comparable in hand weeding and wheel hoeing at 50 DAS.

Keywords: Rhizobium, yield, soybean, hoe

Introduction

The present investigation entitled “Effect of integrated weed management on biological properties of soil, crop growth and productivity of Soybean” was carried out during *kharif* season of 2010 at the Research cum Instructional Farm, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.). The soil of experimental field was clayey in texture, low in nitrogen, Medium in phosphorus and high in potassium contents with neutral in pH.

The experiment was laid in randomized block design with three replications. The treatment comprised of thirteen integrated weed management practices, viz., T₁- quizalofop ethyl 10 EC @ 37.5 g ha⁻¹, T₂- chlorimuron ethyl 25 WP @ 9 g ha⁻¹, T₃- chlorimuron ethyl 25 WP @ 9 g ha⁻¹ + surfactant @ 0.2%, T₄- quizalofop ethyl 10 EC @ 37.5 g ha⁻¹ + chlorimuron ethyl 25 WP @ 9 g ha⁻¹, T₅- quizalofop ethyl 10 EC @ 37.5 g ha⁻¹ + chlorimuron ethyl 25 WP @ 9 g ha⁻¹ + surfactant @ 0.2%, T₆- quizalofop ethyl 10 EC @ 37.5 g ha⁻¹ + chlorimuron ethyl 25 WP @ 9 g ha⁻¹ + surfactant @ 0.2% fb HW at 35 DAS, T₇- imazethapyr 10 SL @ 100 g ha⁻¹, T₈- imazethapyr 10 SL @ 100 g ha⁻¹ + chlorimuron ethyl 25 WP @ 9 g ha⁻¹, T₉- imazethapyr 10 SL @ 100 g ha⁻¹ fb HW at 35 DAS, T₁₀- imazethapyr 10 SL @ 100 g ha⁻¹ fb hoeing (by wheel hoe) at 35 DAS, T₁₁- hoeing twice (by wheel hoe) at 15 DAS and 35 DAS, T₁₂- farmer's practice (hand weeding twice) at 20 DAS and 40 DAS, T₁₃- control (weedy check). Soybean variety ‘JS-335’ was sown as a test crop on July 06th, 2010. Sowing was done with a seed-rate of 75 kg ha⁻¹ at a spacing of 30 x 10 cm. the crop was harvested on October 27th, 2010.

The number of nodules, dry weight of nodules and rhizobial population were maximum under hoeing twice (by wheel hoe) at 15 DAS and 35 DAS (T₁₁) followed by farmer's practices (hand weeding twice) at 20 DAS and 40 DAS (T₁₂), imazethapyr 10 SL @ 100 g ha⁻¹ fb hoeing (by wheel hoe) at 35 DAS (T₁₀), imazethapyr 10 SL @ 100 g ha⁻¹ fb HW at 35 DAS (T₉), imazethapyr 10 SL @ 100 g ha⁻¹ (T₇) and quizalofop ethyl 10 EC @ 37.5 g ha⁻¹ (T₁). They did not find phytotoxicity effect on the vegetative growth of soybean.

The treatment farmer's practice (hand weeding twice) at 20 DAS and 40 DAS (T₁₂) was observed significantly highest seed yield (21.13 q ha⁻¹) as compared to others, but it was at par to hoeing twice (by wheel hoe) at 15 DAS and 35 DAS (T₁₁), imazethapyr 10 SL @ 100 g ha⁻¹ fb hoeing (by wheel hoe) at 35 DAS (T₁₀), imazethapyr 10 SL @ 100 g ha⁻¹ fb HW at 35 DAS (T₉) and quizalofop ethyl 10 EC @ 37.5 g ha⁻¹ + chlorimuron ethyl 25 WP @ 9 g ha⁻¹ + surfactant @ 0.2% fb HW at 35 DAS (T₆).

Correspondence

Anuj Roshan Toppo
Indira Gandhi Krishi
Vishwavidyalaya, Raipur,
Chhattisgarh, India

Table 1:No. of nodules plant⁻¹, Dry weight of nodules (mg plant⁻¹), Rhizobial population(x 10⁵ cfu g⁻¹ soil) and Seed yield of soybean as affected by integrated weed management practices

	Integrated weed management practices	Dose (a.i. ha ⁻¹)	Time of applica- tion	No. of nodules plant ⁻¹	Dry weight of nodules (mg plant ⁻¹)	Rhizobial population (x 10 ⁵ cfu g ⁻¹ soil)	Seed yield (q ha ⁻¹)
				60 DAS	60 DAS	50 DAS	
T ₁	Quizalofop ethyl 10 EC	37.5g	15 DAS	62.53	118.83	24.3	14.40
T ₂	Chlorimuron ethyl 25 WP	9g	15 DAS	54.13	115.62	22.2	10.30
T ₃	Chlorimuron ethyl 25 WP + Surfactant	9g + 0.2%	15 DAS	52.75	113.38	20.9	10.53
T ₄	Quizalofop ethyl 10 EC + Chlorimuron ethyl 25 WP	37.5g + 9g	15 DAS	51.29	112.36	20.0	15.25
T ₅	Quizalofop ethyl 10 EC + Chlorimuron ethyl 25 WP + Surfactant	37.5g + 9g + 0.2%	15 DAS	50.03	107.75	19.2	15.42
T ₆	Quizalofop ethyl 10 EC + Chlorimuron ethyl 25 WP + Surfactant fb HW	37.5g + 9g + 0.2%	15 DAS fb 35 DAS	50.60	108.29	19.4	17.66
T ₇	Imazethapyr 10 SL	100g	15 DAS	61.76	126.69	24.8	16.56
T ₈	Imazethapyr 10 SL + Chlorimuron ethyl 25 WP	100g + 9g	15 DAS	52.93	117.36	21.4	16.76
T ₉	Imazethapyr 10 SL fb HW	100g	15 DAS fb 35 DAS	63.05	127.82	25.1	19.88
T ₁₀	Imazethapyr 10 SL fb Hoeing (by wheel hoe)	100g	15 DAS fb 35 DAS	66.42	128.58	25.3	19.56
T ₁₁	Hoeing (by wheel hoe)	-	15 DAS and 35 DAS	71.33	138.42	27.6	20.81
T ₁₂	Farmer's practice(hand weeding twice)	-	20 DAS and 40 DAS	68.83	136.63	27.2	21.13
T ₁₃	Control (Weedy check)	-	-	45.65	103.46	19.0	9.15
	SEm±			4.56	6.74	1.1	1.1
	CD (P=0.05)			13.31	19.66	3.3	3.3

Conclusion

The present study has been conducted for one season; hence definite conclusion could not be drawn. However, on the basis of results obtained, it can be concluded that application of farmer's practice (hand weeding twice) at 20 and 40 DAS (T₁₂) and hoeing (by wheel hoe) found comparable to each other and proved better in respect of attaining the higher growth, yield, maximum rhizobial population and nodulation of *Kharif* soybean under *Vertisols* condition of Chhattisgarh plain as compared to other integrated weed management practices.

References

1. Dhane JB, Jawale SM, Shaikh AA, Dalavi ND, Dalavi PN. Effect of integrated weed management on yield and economics of soybean (*Glycine max* L. Merrill). Journal of Maharashtra Agricultural University. 2009; 34(2):141-143.
2. Niewiadomska A, Klama J. Pesticide side effect on the symbiotic efficiency and nitrogenase activity of *Rhizobiaceae* bacteria family. Polish Journal of Microbiology. 2005; 54(1):43-48.
3. Raman R, Kuppuswamy G, Krishnamoorthy R. Response of weed management practices on the growth and yield of *urdbean* (*Vigna mungo* Hepper). Legume Research. 2005; 28(2):122-124.
4. Sawicka A, Selwet M. Effect of Active Ingredients on *Rhizobium* and *Bradyrhizobium* Legume Dinitrogen Fixation. Polish Journal of Environmental Studies. 1998; 7(5):317-320.
5. Yadav VK, Sankpal VY, Shaikh AA, Bachkar SR. Effect of integrated weed management on yield and economics of soybean (*Glycine max* L. Merrill). Journal of Maharashtra agricultural Universities. 2009; 34(1):025-027.