



RESEARCH ARTICLE

Efficacy of pre-emergence application of diclosulam on weeds and crop productivity of soybean-mustard cropping system

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ABSTRACT

An experiment was conducted during *Kharif* seasons of 2020 and 2021 to test the bio-efficacy of diclosulam 84% WDG (diclosulam) for weed management in *Kharif* season soybean and its succeeding effect on mustard in *Rabi* season. The study was conducted at District Seed farm-C unit, Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Nadia, West Bengal. The soybean cultivar 'Pusa 16' (duration 110 days) was used. The pre-emergence application (PE) of diclosulam 38.7 g/ha was more effective in managing all predominant grasses, sedges and broad-leaved weeds than other tested herbicides, and recorded 34.81%, 77.1%, 51.9%, 19.2% and 53.79% more primary branches/plant, pods/plant, seeds/pod, test weight and seed yield than the weedy check. It was statistically at par with the hand weeding. Both physico-chemical and biological properties of post-harvest soil remained unaffected by herbicidal treatments. Diclosulam at varied dosages did not cause any adverse effect on germination, plant stand and yield of succeeding mustard. Thus, diclosulam 38.7 g/ha PE can be recommended for effective control of grasses, sedges and broadleaved weeds in soybean under soybean-mustard cropping system.

Keywords: Diclosulam, Mustard, Soybean, Weed management

INTRODUCTION

In West Bengal, soybean [*Glycine max* (L.) Merr.] is cultivated during *Kharif* season covering 235 hectares of land with an average productivity of 0.817 t/ha during 2022-23. However, soybean cultivated area has been declining over the last ten years from 543 ha in 2012-13 to 235 ha in 2022-23. Similarly, soybean production was also dwindled from 439 t in 2012-13 to 192 t in 2022-23. The soybean shares were only 0.05% and 0.04% of area and production of total pulses in West Bengal during 2022-23 (GoWB 2023). Hence, soybean cultivation needs scientific technological interventions for the improvement of soybean area, production and productivity.

Out of many biological constraints, weeds are the major one. Soybean normally grow very short and as a result weeds can easily smother the crop plants. Being a rainy season crop, soybean faces severe

weed competition during early stages of crop growth due to continuous infestation of grasses, sedges and broad-leaved weeds (Zion *et al.* 2025). Weeds compete directly with soybean for light, nutrients and moisture and exhibit allelopathy to reduce crop growth (Singh *et al.* 2009). Initial 45 days after sowing are the most critical for weed competition in soybean (Mishra *et al.* 2016). The yield loss of 10-100%, due to weeds, was reported depending on the weed intensity, nature, environmental condition and duration of weed competition (Rao and Chauhan 2015). Therefore, yield can be increased by keeping the soybean field weed-free during initial critical period.

Weeds and soybean crop emerge simultaneously in uplands during *Kharif* season; hence, the proper time and method of weed control are critical. A few herbicides like pre-emergence application (PE) of pendimethalin and post-emergence application (PoE) of imazethapyr, fluazifop-p-butyl and bentazone are being used to control weeds in *Kharif* soybean. However, repeated use of similar herbicides, in *Kharif* soybean, is not advisable as they have their own limitations. Pendimethalin and imazethapyr control primarily annual grass (Singh *et al.* 2009) and broad-leaved weeds only, fluazifop-p-butyl controls annual and perennial grasses only (Das and Samui 2024).

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Moreover, being a pulse crop soybean is sensitive to many herbicides. Hence, alternative herbicides needed to be identified for effective and broad-spectrum weed control, without phytotoxic effects in soybean.

Diclosulam, a novel herbicide class of triazolo pyrimidine sulphonamide was introduced to India, mainly to control weeds in soybean and groundnut. The efficacy of diclosulam for the control of broad-leaved weeds in a number of field crops (Bhattacharyya *et al.* 2012) and forestry applications (Singh *et al.* 2009) has already been established. Diclosulam can be applied preemergence but will not be effective until rainfall or irrigation has moved it into the soil where weed germination occurs (Grey *et al.* 2001). Its longevity in the soil makes diclosulam ideal for control of broad-leaved weeds in soybean (Bhattacharyya *et al.* 2012). But its use in study location has been limited due to its non-availability and hence, actual potentiality is still unknown in *Kharif* soybean cultivation. Furthermore, the dosage of diclosulam recommended for soybean cultivation may vary based on the moisture content and organic matter of the soil and factors that influence the adsorption of diclosulam. Thus, diclosulam efficacy to manage weeds in soybean under alluvial soil of West Bengal is yet to be studied. Hence, the present study was conducted with an objective to assess the efficacy of diclosulam in effectively managing complex weed flora of Soybean in Nadia, West Bengal.

MATERIALS AND METHODS

The study was conducted during *Kharif* season soybean (2020 and 2021) and succeeding mustard crop in *Rabi* season at District Seed farm-C unit, Kalyani, Nadia, West Bengal under Bidhan Chandra Krishi Viswavidyalaya (situated at 22°58' N latitude, 88°25' E longitude and 9 m above mean sea level). Medium land (water stagnation never exceeds 30 cm) was chosen for the study. The soil was sandy clay loam (27.4% sand, 44.4% silt and 28.2% clay according to Hydrometer method) in texture and had the following key properties for the 0–30 cm layer: pH 7.35 (in 1:2.5::Soil:Water), electrical conductivity (EC) 0.25 dS/m (in 1:2.5::Soil:Water), organic carbon 0.50% (wet oxidation method), available N 182.1 kg/ha (Hot alkaline KMnO₄ Method), available P 78.3 kg/ha (0.5 M NaHCO₃ extract) and available K 193.2 kg/ha (Neutral N NH₄OAc extract). The study location had sub-humid and sub-tropical climate with an average annual rainfall of 1200 mm, 80% of which falls during rainy season (June to September) due to

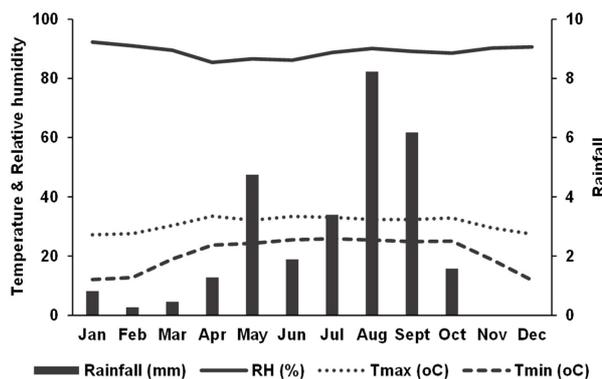


Figure 1. Monthly temperature, relative humidity and rainfall recorded at experimental site (average of 2-years data)

south-west monsoon. Weather data were logged at Automated Weather Station (AWS), Directorate of Research, BCKV, Kalyani, Nadia. Meteorological parameters, based on 2-years average, pertaining to the period of experimentation have been depicted in **Figure 1**. Average monthly maximum and minimum temperatures fluctuated between 27.22 and 33.47°C, and 11.85 and 25.84°C, respectively. Average relative humidity ranged from 85.40 to 92.29%. Total average rainfall was 28.856 mm; however, there was no rain in November and December months.

There were 8 treatments: diclosulam 22.01 g/ha, 3 days after seeding (DAS); diclosulam 25.95 g/ha, 3 DAS; diclosulam 32.50 g/ha, 3 DAS; diclosulam 22.01 g/ha, 3 DAS; diclosulam 25.96 g/ha, 3 DAS; imazethapyr + surfactant 100 g/ha MSO adjuvant 2 ml/L water, 10 DAS; hand weeding twice 20 and 40 DAS and untreated control (weedy check), Herbicides were sprayed by using 500 liters of water/ha.

A randomized complete block design (RCBD) with three replications was used. The soybean cultivar '*Pusa 16*' (duration 110 days) was sown during *Kharif* season on 5th July. Seeds were sown at a spacing of 45 cm × 5 cm in every single plot (4 m × 5 m). On maturity, the crop was harvested on 23rd October. All the recommended improved package of practices of soybean crop was followed in this experiment including the plant protection measures. All the test herbicides were sprayed at the given time using a water volume of 500-600 liters/ha with knapsack sprayer fitted with flat fan deflector nozzle. Weed free treatment was maintained by hand weeding at regular interval. After harvesting of soybean crop, mustard (cv. B-9/Binoy) was sown 5 kg/ha in the undisturbed field layout of trial plot with a spacing of 30 cm × 10 cm on 28th October. The crop was allowed to grow with recommended package of practices suitable for the region and was harvested on

5th January. The mustard crop received no herbicidal treatments for weed control and the residual effect of herbicidal treatments adopted for preceding soybean crop was assessed. The population of weeds (weed density) was recorded species-wise at 30 days after sowing (DAS), 45 DAS and 60 DAS. A quadrat of 1 m × 1 m size was placed randomly at five spots in each plot and the weeds from that area were counted and expressed as weed density (no./m²). Predominant weeds belonging to three categories (grasses, sedges and broad-leaved weeds) obtained in population at the respective days were labeled properly. The labeled samples were then sun dried for 24 hours and then oven-dried at 70°C for 72 hours. The dry weight of weeds (weed biomass) was then recorded species-wise separately.

Weed control efficiency is expressed as the percentage of control of weeds over unweeded control on dry weight basis by using the following formula.

$$WCE = \frac{DWC - DWT}{DWC} \times 100$$

Where, DWC = Weed biomass in untreated control plot; DWT = Weed biomass in treated plot with herbicide

The data on grain yield and haulm yield were recorded for soybean. Both grain and haulm yield of soybean was recorded plot-wise after threshing and then converted in t/ha.

Observation on follow-up crop *i.e.*, mustard raised in undisturbed layout of trial plot, was recorded

with respect to previously applied different doses of diclosulam at 26.2, 30.9 and 38.7 g/ha along with market standard samples. The observations on crop emergence, plant stand, yield and symptoms of phytotoxicity were recorded at 15 DAS, 30 DAS and at harvest. Finally, grain yields were recorded at harvest.

As wide variation existed in number of weeds, data were transformed through square-root $\sqrt{x+0.5}$ method before statistical analysis. All the collected data were analyzed statistically by the method of analysis of variance (ANOVA) as per the procedure outlined for randomized complete block design (Gomez and Gomez 1984). Statistical significance was tested by P-value at 0.05 level of probability and critical difference (CD) was worked out wherever the effects were significant.

RESULTS AND DISCUSSION

Effect on weeds

Broad-leaved weeds: *Euphorbia geniculata*, *Digera arvensis*, *Commelina benghalensis*, and *Acalypha indica*, as well as grassy weeds like *Echinochloa colona* and the sedge *Cyperus rotundus* were found to be infesting soybean. The hand weeding twice was the most effective treatment in terms of weed density reduction at 30, 45 and 60 DAS (**Table 2**). Diclosulam 38.7 g/ha was the most effective at controlling weeds and reducing weed density and biomass (**Table 2**) with higher weed control efficiency (**Table 3**), among all herbicide treatments

Table 1. Density of grasses, sedges and broad-leaved weeds (no./m²) in soybean field as affected by treatments during Kharif season (pooled data of 2 years)

Treatment	<i>Echinochloa colona</i>		<i>Cyperus rotundus</i>		<i>Euphorbia geniculata</i>		<i>Digera arvensis</i>		<i>Commelina benghalensis</i>		<i>Acalypha indica</i>		Total	
	30	60	30	60	30	60	30	60	30	60	30	60	30	60
	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS
Diclosulam 22.01 g/ha, 3 DAS	1.72** (2.45*)	2.35** (5.04*)	1.57 (1.96)	2.18 (4.25)	1.47 (1.65)	2.48 (5.65)	1.35 (1.32)	2.60 (6.25)	1.12 (0.75)	2.47 (5.62)	1.17 (0.86)	2.27 (4.66)	8.40 (8.99)	14.35 (31.47)
Diclosulam 25.95 g/ha, 3 DAS	1.55 (1.89)	2.13 (4.05)	1.23 (1.01)	2.00 (3.52)	1.40 (1.44)	2.27 (4.66)	1.24 (1.04)	2.18 (4.26)	1.07 (0.64)	2.15 (4.11)	1.10 (0.72)	2.09 (3.86)	7.59 (6.74)	12.82 (24.46)
Diclosulam 32.50 g/ha, 3 DAS	1.23 (1.01)	1.86 (2.96)	1.06 (0.62)	1.58 (2.01)	1.16 (0.85)	1.88 (3.02)	1.12 (0.75)	1.90 (3.11)	1.00 (0.51)	1.78 (2.66)	1.02 (0.55)	1.87 (3.01)	6.57 (4.29)	10.87 (16.77)
Diclosulam 22.01 g/ha, 3 DAS	2.60 (6.25)	3.28 (10.26)	1.90 (3.12)	3.15 (9.44)	1.75 (2.56)	3.03 (8.69)	1.72 (2.45)	3.17 (9.56)	1.87 (2.99)	3.18 (9.60)	1.58 (1.99)	2.83 (7.52)	11.42 (19.36)	18.64 (55.07)
Diclosulam 25.96 g/ha, 3 DAS	2.51 (5.82)	3.08 (8.99)	1.78 (2.66)	2.95 (8.20)	1.62 (2.11)	2.75 (7.06)	1.48 (1.69)	2.99 (8.45)	1.70 (2.40)	2.83 (7.52)	1.42 (1.52)	2.59 (6.23)	10.51 (16.20)	17.19 (46.45)
Imazethapyr + surfactant 100 g/ha, 10 DAS	2.13 (4.05)	3.10 (9.14)	2.07 (3.78)	2.91 (7.99)	1.86 (2.96)	3.11 (9.15)	1.58 (1.99)	2.76 (7.14)	1.76 (2.59)	3.02 (8.65)	1.68 (2.33)	2.82 (7.48)	11.08 (17.7)	17.72 (49.55)
Hand weeding twice 20 and 40 DAS	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)	0.00 (0.71)
Untreated control (weedy check)	5.74 (32.44)	7.50 (55.68)	3.15 (9.42)	4.02 (15.69)	2.80 (7.33)	3.98 (15.32)	2.99 (8.42)	3.82 (14.12)	2.84 (7.55)	3.75 (13.55)	2.65 (6.53)	3.81 (14.05)	20.17 (71.69)	26.88 (128.41)
LSD (p=0.05)	0.27	0.25	0.15	0.37	0.21	0.35	0.10	0.26	0.06	0.34	0.07	0.20	0.86	1.77

*Data in the parentheses are original values; **Square root transformed value of $\sqrt{x+0.5}$ was used for statistical analysis; DAS, days after sowing

as reported earlier by Singh *et al.* (2009); Musa *et al.* 2022. Next effective treatments were diclosulam 30.9 and 26.2 g/ha. Diclosulam 30.9 g/ha was found to be superior than imazethapyr + surfactant 100 g/ha in reducing weed density and biomass. Significantly higher weed biomass was recorded with un-weeded check. The broad-spectrum efficacy of diclosulam was attributed to its ability to suppress weed growth across different taxonomic groups (Sridhar *et al.* 2021). Reddy (2000) reported that diclosulam either as pre-plant incorporation (PPI) or pre-emergence application (PE) effectively controlled key broad-leaved weeds and some grasses, resulting in higher soybean yields.

Effect on soybean yield attributes and yield

Diclosulam 38.7 g/ha recorded 34.81%, 77.1%, 51.9% and 19.2% more primary branches/plant, pods/plant, seeds/pod and test weight than the weedy check and recorded higher yield attributes than other

treatments (Table 4). Next best was diclosulam 30.9 g/ha. Better vegetative and reproductive growth of crop under diclosulam 32.50 g/ha, 3 DAS treatment might have achieved due to better weed control (Musa *et al.* 2022, Das and Samui 2024). The yield attributes of soybean crop were drastically reduced in the weedy check plots due to severe weed competition confirming Rao *et al.* (2000). Compared to the unweeded control, all weed management methods considerably enhanced seed and haulm yield (Table 4). Diclosulam 38.7 g/ha provided statistically greater yield than other treatments followed by diclosulam 30.9 g/ha. When compared to the weedy check, the soybean seed yield has increased by 53.79% and 37.24% with diclosulam 38.7 g/ha and 30.9 g/ha respectively. In contrast, lowest seed yield of soybean was observed in weedy check plots because of heavy weed infestation vis-à-vis severe crop-weed competition and huge exploitation of growth factors by the weeds.

Table 2. Biomass of grasses, sedges and broad-leaved weeds (g/m²) in soybean as affected by treatments during Kharif season (pooled data of 2 years)

Treatment	<i>Echinochloa colona</i>		<i>Cyperus rotundus</i>		<i>Euphorbia geniculata</i>		<i>Digera arvensis</i>		<i>Commelina benghalensis</i>		<i>Acalypha indica</i>		Total	
	30	60	30	60	30	60	30	60	30	60	30	60	30	60
	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS
Diclosulam 22.01 g/ha, 3 DAS	4.56	8.55	3.01	7.26	3.16	8.66	2.99	7.56	3.55	10.20	3.22	8.15	20.49	50.38
Diclosulam 25.95 g/ha, 3 DAS	3.24	6.59	2.46	5.68	2.88	6.96	2.45	6.23	3.01	8.01	2.88	7.01	16.92	40.48
Diclosulam 32.50 g/ha, 3 DAS	1.42	4.26	1.99	4.06	1.89	4.03	1.64	3.96	1.48	5.03	1.76	4.56	10.18	25.90
Diclosulam 22.01 g/ha, 3 DAS	8.22	12.46	3.05	8.96	4.01	11.26	4.50	9.56	4.96	13.26	2.96	9.10	27.70	64.60
Diclosulam 25.96 g/ha, 3 DAS	7.86	11.86	3.01	7.66	3.99	10.69	4.10	9.00	4.22	12.01	2.86	9.00	26.01	60.22
Imazethapyr + surfactant 100 g/ha, 10 DAS	8.46	12.30	3.60	10.69	4.15	10.68	3.99	8.69	5.01	11.36	3.77	11.24	28.98	64.96
Hand weeding twice 20 and 40 DAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Untreated control (weedy check)	28.46	35.80	12.25	20.15	15.02	22.36	18.01	24.01	16.42	25.23	11.40	15.63	101.56	143.18
LSD (p=0.05)	1.78	1.96	0.45	1.46	0.88	2.01	0.72	1.28	0.85	2.00	0.95	1.85	5.63	10.56

DAS, days after sowing

Table 3. Weed control efficiency (%) against grasses, sedges and broad-leaved weeds in soybean as affected by treatments during Kharif season (pooled data of 2 years)

Treatment	<i>Echinochloa colona</i>		<i>Cyperus rotundus</i>		<i>Euphorbia geniculata</i>		<i>Digera arvensis</i>		<i>Commelina benghalensis</i>		<i>Acalypha indica</i>		Total	
	30	60	30	60	30	60	30	60	30	60	30	60	30	60
	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS	DAS
Diclosulam 22.01 g/ha, 3 DAS	83.98	76.12	75.43	63.97	78.96	61.27	83.40	68.51	78.38	59.57	71.75	47.86	79.82	64.81
Diclosulam 25.95 g/ha, 3 DAS	88.62	81.59	79.92	71.81	80.83	68.87	86.40	74.05	81.67	68.25	74.74	55.15	83.34	71.73
Diclosulam 32.50 g/ha, 3 DAS	95.01	88.10	83.76	79.85	87.42	81.98	90.89	83.51	90.99	80.06	84.56	70.83	89.98	81.91
Diclosulam 22.01 g/ha, 3 DAS	71.12	65.20	75.10	55.53	73.30	49.64	75.01	60.18	69.79	47.44	74.04	41.78	72.73	54.88
Diclosulam 25.96 g/ha, 3 DAS	72.38	66.87	75.43	61.99	73.44	52.19	77.23	62.52	74.30	52.40	74.91	42.42	74.39	57.94
Imazethapyr + surfactant 100 g/ha, 10 DAS	70.27	65.64	70.61	46.95	72.37	52.24	77.85	63.81	69.49	54.97	66.93	28.09	71.47	54.63
Hand weeding twice 20 and 40 DAS	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Untreated control (weedy check)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DAS, days after sowing

Table 4. Yield attributes and yield of *Kharif* soybean and mustard in succession as affected by treatments tested in soybean (pooled data of 2 years)

Treatment	Soybean						Seedling Emergence (%) at 15 DAS	Mustard			Seed yield (kg /ha)
	Yield attributes				Yield (t/ha)			Plant stand (nos./m ²)			
	Primary branches / plant	Pods/ plant	Seeds/ pod	Test weight (g)	Seed	Haulm		15 DAS	30 DAS	Harvest	
Diclosulam 22.01 g/ha, 3 DAS	3.31	55	2.40	131	1.71	3.61	100	33	32	32	760
Diclosulam 25.95 g/ha, 3 DAS	3.43	58	2.65	136	1.99	3.91	100	33	33	33	801
Diclosulam 32.50 g/ha, 3 DAS	3.64	62	3.19	143	2.23	4.30	100	33	33	33	945
Diclosulam 22.01 g/ha, 3 DAS	3.30	56	2.41	132	1.50	3.40	100	33	31	31	690
Diclosulam 25.96 g/ha, 3 DAS	3.41	57	2.51	135	1.60	3.45	100	33	32	31	750
Imazethapyr + surfactant 100 g/ha, 10 DAS	3.39	57	2.45	139	1.85	3.70	100	33	33	33	807
Hand weeding twice 20 and 40 DAS	3.72	64	3.24	145	2.35	4.35	100	33	33	33	970
Untreated control (weedy check)	2.70	35	2.10	120	1.45	2.90	100	33	32	31	490
LSD (p=0.05)	0.09	2.10	0.06	2.12	0.14	0.07	-	-	-	-	27.00

DAS, Days after sowing

Table 5. Soil (0-15 cm) physico-chemical properties and status of soil micro-flora after *Kharif* soybean harvest as affected by treatments (pooled data of 2 years)

Treatment	Physico-chemical properties						Soil micro-flora (cfu × 10 ⁶ /g of soil)		
	pH	EC (dS/m)	OC (%)	Av. N (kg/ha)	Av. P (kg/ha)	Av. K (kg/ha)	Bacteria	Fungi	Actinomycetes
Diclosulam 22.01 g/ha, 3 DAS	7.32	0.21	0.51	88.51	75.33	199.52	74.52	24.51	21.45
Diclosulam 25.95 g/ha, 3 DAS	7.12	0.24	0.55	85.02	72.24	194.25	76.82	26.33	22.59
Diclosulam 32.50 g/ha, 3 DAS	7.44	0.25	0.54	91.24	74.01	195.63	85.42	30.56	24.51
Diclosulam 22.01 g/ha, 3 DAS	7.32	0.29	0.60	88.21	72.12	201.45	73.26	24.00	20.12
Diclosulam 25.96 g/ha, 3 DAS	7.40	0.31	0.53	84.56	70.14	200.53	66.85	23.14	21.38
Imazethapyr + surfactant 100 g/ha, 10 DAS	7.51	0.24	0.59	90.50	70.34	194.22	68.77	20.15	20.20
Hand weeding twice 20 and 40 DAS	7.49	0.30	0.52	85.46	74.55	191.25	75.96	29.56	23.56
Untreated control (weedy check)	7.27	0.28	0.55	86.21	71.42	196.28	62.38	20.77	21.44
LSD (p=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS

DAS, Days after sowing; NS, Non-significant

Effect on physico-chemical properties and microbial population of soil

The physico-chemical properties of soil like pH, EC and organic carbon were not significantly influenced by the herbicidal treatments compared to initial status of soil (Table 5). Available soil N (91.24 kg/ha), P (75.33 kg/ha) and K status (201.45 kg/ha) in post-harvest soil was increased with diclosulam 38.7 g/ha, diclosulam 26.2 g/ha and diclosulam 26.2 g/ha compared to initial status. Total micro flora population has increased with diclosulam 38.7 g/ha (Table 5). Total bacterial, fungal and actinomycetes population was changed from 74.86 cfu × 10⁶/g (initial) to 85.42 cfu × 10⁶/g (final), 24.59 cfu × 10⁶/g (initial) to 30.56 cfu × 10⁶/g (final) and 22.43 cfu × 10⁶/g (initial) to 24.51 cfu × 10⁶/g (final) respectively as microorganisms engaged in the process of herbicide breakdown which released carbon-rich substrates that boost the number of soil microorganisms (Das and Samui 2024).

Effect on emergence, plant stand and yield of succeeding mustard crop

The emergence percent of mustard crop was not affected due to different herbicidal treatments applied in the preceding *Kharif* soybean (Table 4). On the other hand, the herbicidal treatments applied in soybean resulted in significant improvements/ variations in seed yield of succeeding crop mustard (Table 4). The treatments that were effective in soybean also recorded the highest mustard seed yield. Diclosulam 38.7 g/ha PE applied in soybean has recorded significantly higher mustard seed yield which was 92.9% higher yield over untreated control (weedy check), due to its longer persistence in soil with slight residual effects on weeds in the succeeding mustard crop.

Conclusion

Diclosulam 38.7 g/ha PE can be recommended for effective control of grasses, sedges and broad-leaved weeds in *Kharif* soybean cultivation in alluvial soil of West Bengal.

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