Indian Journal of Weed Science (2023) **55**(4): 420–424
http://dx.doi.org/10.5958/0974-8164.2023.00076.X

RESEARCH ARTICLE

Efficacy of pre- and post-emergence herbicides in vegetable pea

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Received: 7 June 2023 | Revised: 6 November 2023 | Accepted: 7 November 2023

ABSTRACT

A field experiment was carried out at Research Farm of AICRP-Weed Management, Chatha, SKUAST-Jammu during the *Rabi* (winter) season of 2016-17 and 2017-18 to study the efficacy of different herbicides against weeds and their effect on growth and yield of vegetable peas. Results revealed that among the ready-mix herbicidal treatments, pendimethalin + imazethapyr at 1250 g/ha as pre-emergence produced less weed density (m^2) for both broad-leaved and grassy weeds during both the years. It was also found that the pendimethalin + imazethapyr at 1250 g/ha as pre-emergence significantly enhanced the growth attributes at 50 days after sowing compared to the other herbicidal applications. Pendimethalin + imazethapyr at 1250 g/ha as pre-emergence and pendimethalin + imazethapyr at 1000 g/ha as pre-emergence proved as effective weed management treatments and recorded significantly higher green pod yield, net returns, and benefit: cost ratio compared to other treatments.

Keywords: Herbicides, Pre-emergence, Post-emergence, Vegetable pea

INTRODUCTION

Vegetable pea (*Pisum sativum* L.) also known as Garden pea is an herbaceous annual belonging to Leguminosae family, originally from the Mediterranean region of Southern Europe and Western Asia, widely grown in India for its green seed pod. Pea is the third most important pulse crop at global level, after dry bean and chickpea and third most popular *Rabi* (winter) pulse of India after chickpea and lentil. Vegetable/garden/green pea is largely grown during the *Rabi* season in the states of Karnataka, Madhya Pradesh, Rajasthan, West Bengal, Punjab, Assam, Haryana, Uttar Pradesh, Uttarakhand, Himachal Pradesh, Bihar and Odisha. India contributes to around 7-10% of the world's total produce of dry pea. Vegetable pea is a highly nutritive crop with a high percentage of protein (22.5%), carbohydrate (62.1%), fat (1.8%), calcium (64 mg/ 100 g), and iron (4.8 mg/100 g) with moisture content around 11%.

One of the main obstacles to pea production worldwide is weeds. Weeds are well-adapted in crop fields due to various morphological (seed mimicry, phenotypic/vegetative mimicry) and phenological characteristics (discontinuous germination, quick growth, very short parental dependence to seedling independence, high seed production, large seed bank, chronological mimicry *etc*.). Due to the short life cycle, shallow root system, and sparse canopy, pea is considered a highly sensitive crop to the competition of weeds. Being a direct-seeded crop, pea has a longer critical period of weed interference (Medina 1995). In addition to reducing crop output by competing for moisture, nutrients, space and light, weeds can contaminate a pea crop by harbouring insects and fungi, which makes harvesting more challenging (Bithell 2004). It is also noticed that the variability in climatic conditions and soil types also influence the severity and diversity of weeds in crops. Hence, early season weed control is extremely important and a major emphasis on control should be made during this period.

Weeds have been reported to cause 81% loss in its yield (Singh *et al*. 1996). According to Bhyan *et al*. (2004), the critical period for crop-weed competition in pea ranged from 40 to 60 days after sowing. Manual weeding is effective but it is cumbersome, time consuming and uneconomical, while mechanical means generally lead to root injury (Casarini *et al*. 1996). However, the information on post-emergence herbicides to control weeds is very scanty. Many times, the extension workers and farmers of the state demand information on post-emergence herbicides especially when they fail to apply pre-emergence herbicides due to one or the other reasons. There are no integrated weed management strategies for peas that are location-specific (Ali *et al.* 2014). Most of the weeding is done by hand, which is labour-intensive,

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expensive and time-consuming. Pendimethalin, a broad-spectrum herbicide that is selective to pea (Kulshrestha *et al.* 2000) and effective against annual grassland weeds and a few broad-leaved weeds, is the principal pre-emergence herbicide used by large and commercial pea growers. Yet, because different weeds have different morphologies, physiologies and tolerances, merely pre-emergence spraying is insufficient to control them. A single herbicide used continuously may encourage weed resistance and shift. Therefore, new strategies should be adopted in order to control the menace caused by weeds. According to Eskin (2000), post-emergence herbicides were found to be more effective at controlling broad-leaved weeds than pre-emergence herbicides in suppressing grassy weeds that were already germinating. Mixing herbicides is a common practice in agriculture, to optimize farm management practices, widen the weed control spectrum, enhance application efficiency, and manage herbicide resistance. Also, the mixed herbicide applications have been found to improve broad-spectrum weed control, minimise weed shift and postpone resistance (Das *et al.* 2014). Therefore, herbicide mixture may be used as a prominent strategy for weed management. Considering these points, the present investigation was therefore, done with the objectives to study the efficacy of different herbicides against weeds and their effect on growth and yield of vegetable peas.

MATERIALS AND METHODS

The present field experiment was conducted during the *Rabi* season of 2016-17 and 2017-18 at Research Farm of AICRP-Weed Management, Chatha, SKUAST-Jammu in a randomized block design with three replications having fifteen treatments namely clodinafop 60 g/ha as PoE, pinoxaden 50 g/ha as PoE, pendimethalin at 1.0 kg/ha as PE, pendimethalin + imazethapyr at 800 g/ha as PE, pendimethalin + imazethapyr at 1000 g/ha as PE, pendimethalin + imazethapyr at 1250 g/ha as PE, imazethapyr at 70 g/ha as PE, imazethapyr at 60 g/ha at 2-4 leaf stage, imazethapyr at 70 g/ha at 2-4 leaf stage, imazethapyr 80 g/ha at 2-4 leaf stage, imazethapyr+ imazamox 60 g/ha at 2-4 leaf stage, imazethapyr+ imazamox 70 g/ha at 2-4 leaf stage, imazethapyr+ imazamox 80 g/ha at 2-4 leaf stage, weed free, and weedy check.

The experimental site was situated at 32.6529° N latitude and 74.8071° E longitude at an elevation of 332 meters above mean sea level. The soil of the experimental field was sandy clay loam in texture, slightly alkaline in reaction, low in organic carbon and available nitrogen but medium in phosphorus and potassium. The pea variety '*Arkel*' was sown on second week of October during the year 2016 and 2017 in a gross plot size of 4.6 x 3.2 m. All the herbicides were applied by using a knapsack sprayer fitted with flat-fan nozzle with spray volume of 500 liters /ha. Data on weed density and biomass were recorded at 25 and 50 days after sowing of crop by using 1x1 m quadrant. Phytotoxicity symptoms were recorded using visual score scale of 0-10 at 10 days after the application of herbicides. Growth and yield attributes and yield were recorded to draw the valuable inferences.

RESULTS AND DISCUSSION

Weed flora in the experiment field

Both broad-leaved and grassy weeds were found to be dominant in the experimental field. Among the broad-leaved weeds, the most dominant weed species found in experimental field during crop growth period were mainly *Vicia sativa, Anagallis arvensis, Melilotus indica* and *Medicago denticulata* and the grassy weeds were *Phalaris minor and Cynodon dactylon*. In general, the broad-leaved weeds were more dominant in experiment field compared to the grassy weeds.

Effect on weeds

During both the years, various weed control treatments considerably reduced the density of grassy and broad-leaved weeds when compared to weedy check. Weed management treatments had significant effect on weed density and weed biomass at 25 and 50 DAS (**Table 1** and **2**). Among the herbicidal treatments, lowest density and biomass of broad-leaved weeds were recorded in pendimethalin + imazethapyr 1250 g/ha as pre-emergence which was statistically at par with pendimethalin + imazethapyr 1000 g/ha as pre-emergence during both the years except weed density during 2017-18. Imazethapyr and pendimethalin are two classes of herbicides that have different mechanisms of action and are broad-spectrum and selective to pea (Wagner and Nadasy 2006, Kukharchik *et al.* 2013, Shalini and Singh 2014). Hajebi *et al.* (2016) also observed similar kind of trend when the applications of these herbicides were made in sequence, resulting in the reduce the weed population. Shalini and Singh (2014) also reported similar results with pendimethalin and imazethapyr. Among the post-emergence herbicides, imazethapyr 80 g/ha recorded lowest broad-leaved weed density and biomass as compared to other treatments. Different doses of imazethapyr + imazamox recorded almost statistically at par weed density and weed biomass (broad-leaved as well as grassy). Imazethapyr + imazamox and pinoxaden showed phytotoxicity (slightly yellowing of leaves) initially but that recovered 25 days after application. The lowest density and biomass of grassy weeds were recorded in pinoxaden 50 g/ha which was statistically at par with clodinafop propargyl 60 g/ha and significantly lower than other treatments. This showed that clodinafop propargyl and pinoxaden herbicides are grassy weed killer.

Effect on growth and yield attributes

Different weed management treatments had significant effect on growth and yield attributes as compared to weedy check (**Table 3**). Among the weed management treatments, all the weed management treatments recorded significantly higher plant height, plant dry matter, and number of nodules, number of pods, and number of seeds/pod for both 2016-17 and 2017-18 as compared to weedy check. Among the herbicidal treatments, pendimethalin + imazethapyr 1250 g/ha as pre-emergence recorded higher plant height (48.70 cm for 2016-17 and 51.77 cm for 2017-18), plant dry matter (2.72 g/m^2 for 2016-17 and 2.63 g/m^2 for 2017-18), number of nodules (17.57 for 2016-17 and 18.40 for 2017-18), number of pods (16.70 for 2016-17 and 18.50 for 2017-18) and number of seeds/pod (8.00 for 2016-17 and 8.20 for 2017-18). Pendimethalin + imazethapyr 1250 g/ha pre-emergence was at par with pendimethalin + imazethapyr at 1000 g/ha pre-emergence during both 2016-17 and 2017-18 crop growing years with respect to growth and yield attributes. Reduced weed density allowed crop canopies to expand horizontally across more branches and have greater leaf areas, which increased photosynthesis and the build-up of dry matter (Singh and Tripathi 2004, Wagner and Nadasy 2010, Bhullar

Table 1. Effect of different weed management practices on weed density in vegetable pea

Treatment	Weed density (m^2) at 25 DAS				Weed density (m^2) at 50 DAS			
	Broad-leaved weeds		Grassy weeds		Broad-leaved weeds		Grassy weeds	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
Clodinafop 60 g/ha at 2-4 LS	7.15 (50.3)	6.55 (41.9)	1.79 (2.3)	2.16 (3.7)	6.47 (41.0)	6.01 (35.2)	2.13 (3.7)	2.54 (5.5)
Pinoxaden 50 g/ha at 2-4 LS	7.23 (51.3)	6.64 (43.1)	1.73 (2.0)	2.06 (3.3)	6.71 (44.0)	6.07 (35.9)	1.93 (3.0)	2.47 (5.1)
Pendimethalin at 1.0 kg/ha as PE	5.07 (25.0)	3.95 (14.7)	3.37 (10.7)	3.6 (12.0)	4.60 (20.3)	3.05 (8.4)	3.39 (10.7)	3.85 (13.8)
Pendimethalin + imazethapyr at 800 g/ha as PE	4.11 (16.0)	3.68 (12.5)	3.20 (9.3)	3.14 (9.0)	3.63 (12.3)	2.55 (5.5)	3.10 (8.7)	3.43 (10.8)
Pendimethalin + imazethapyr at 1000 g/ha as PE	3.51 (11.3)	2.58 (5.6)	2.99 (8.0)	2.82 (7.0)	3.07 (9.0)	2.21 (3.9)	2.99 (8.0)	3.13 (8.8)
Pendimethalin + imazethapyr at 1250 g/ha as PE	3.05 (8.3)	1.90 (2.6)	2.94 (7.7)	2.76 (6.7)	2.70 (6.3)	1.75 (2.1)	2.69 (6.3)	3.00 (8.1)
Imazethapyr at 70 g/ha as PE	4.43 (18.7)	4.38 (18.2)	3.23 (9.7)	3.23 (9.7)	3.90 (14.3)	3.49 (11.2)	3.36 (10.3)	3.51 (11.4)
Imazethapyr at 60 g/ha at 2-4 LS	6.02 (35.3)	5.40 (28.3)	3.46 (11.0)	3.55 (11.7)	5.65 (31.0)	4.72 (21.4)	3.46 (11.0)	3.80 (13.5)
Imazethapyr at 70 g/ha at 2-4 LS	5.32 (27.3)	5.67 (31.3)	3.45 (11.0)	3.26 (9.7)	5.03 (24.3)	5.01 (24.3)	3.31 (10.0)	3.53 (11.4)
Imazethapyr 80 g /ha at 2-4 LS	5.09 (25.0)	4.71 (21.2)	3.36 (10.3)	3.31 (10.0)	4.64 (20.7)	3.91 (14.4)	3.21 (9.3)	3.57 (11.8)
Imazethapyr + imazamox 60 g/ha at 2-4 LS	5.69 (31.7)	5.64 (30.8)	3.29 (10.0)	3.19 (9.3)	5.37 (28.0)	4.91 (23.2)	3.17 (9.3)	3.46 (11.1)
Imazethapyr + imazamox 70 g/ha at 2-4 LS	5.78 (32.7)	6.27 (38.4)	3.26 (9.7)	3.26 (9.7)	5.50 (29.3)	5.68 (31.3)	3.26 (9.7)	3.52 (11.5)
Imazethapyr + imazamox 80 g/ha at 2-4 LS	5.60 (30.3)	6.41 (40.2)	3.30 (10.0)	3.10 (8.7)	5.28 (27.0)	5.87 (33.5)	3.36 (10.3)	3.37 (10.4)
Weed free	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
Weedy check	7.78 (59.7)	8.68 (74.4)	3.73 (13.0)	3.59 (12.0)	7.63 (57.3)	8.44 (70.3)	4.16 (16.3)	3.92 (14.4)
LSD (p=0.05)	0.70	0.51	1.47	0.59	0.65	0.53	0.63	0.40

Table 2. Effect of different weed management practices on weed biomass in vegetable pea

Treatment	Weed dry biomass (g/m^2) at 25 DAS				Weed dry biomass (g/m^2) at 50 DAS			
	Broad-leaved weeds		Grassy weeds		Broad-leaved weeds		Grassy weeds	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
Clodinafop 60 g/ha at 2-4 LS	8.17(66.0)	7.65(57.6)	1.93(2.8)	2.30(4.3)	11.12(123.0)	9.99(99.0)	3.31(10.0)	4.10(15.9)
Pinoxaden 50 g/ha at 2-4 LS	8.28(67.6)	7.89(61.3)	1.86(2.5)	2.25(4.1)	11.53(132.0)	10.09(100.9)	2.94(8.4)	3.96(14.7)
Pendimethalin at 1.0 kg/ha as PE	5.74(32.3)	4.67(20.8)	3.69(12.7)	3.89(14.2)	7.85(61.0)	4.98(24.0)	5.40(28.7)	6.49(41.2)
Pendimethalin + imazethapyr at 800 g/ha as PE	4.59(20.3)	4.30(17.6)	3.49(11.3)	3.46(11.2)	6.13(37.0)	4.04(15.4)	4.93(23.4)	5.67(31.2)
Pendimethalin + imazethapyr at 1000 g/ha as PE	3.89(14.4)	3.00(8.0)	3.24(9.6)	2.98(8.0)	4.85(23.9)	3.39(10.6)	4.37(21.6)	5.14(25.5)
Pendimethalin + imazethapyr at 1250 g/ha as PE	3.50(11.3)	2.15(3.7)	3.18(9.2)	3.00(8.1)	4.81(22.2)	2.58(5.7)	4.26(17.4)	4.93(23.3)
Imazethapyr at 70 g/ha as PE	5.02(24.3)	5.14(25.5)	3.51(11.6)	3.51(11.4)	6.65(43.7)	5.69(31.5)	4.15(18.7)	5.82(33.1)
Imazethapyr at 60 g/ha at 2-4 LS	4.73(25.6)	6.36(39.6)	3.67(12.5)	3.86(14.0)	9.61(91.3)	7.79(60.1)	5.56(30.0)	6.47(40.9)
Imazethapyr at 70 g/ha at 2-4 LS	6.13(36.7)	6.68(43.8)	3.76(13.2)	3.61(12.0)	8.57(72.7)	8.30(68.3)	5.29(27.0)	5.84(33.2)
Imazethapyr 80 g /ha at 2-4 LS	5.60(30.6)	5.53(29.7)	3.81(13.6)	3.60(12.0)	7.91(62.0)	6.42(40.3)	5.11(25.2)	6.04(35.6)
Imazethapyr + imazamox 60 g/ha at 2-4 LS	6.46(41.2)	6.63(42.9)	2.92(7.6)	3.47(11.2)	9.41(87.7)	8.12(65.1)	5.04(25.2)	5.73(32.3)
Imazethapyr + imazamox 70 g/ha at 2-4 LS	6.57(42.5)	7.41(54.0)	3.50(11.3)	3.53(11.5)	9.51(89.7)	9.43(87.9)	5.19(26.1)	5.84(33.2)
Imazethapyr + imazamox 80 g/ha at 2-4 LS	6.37(39.6)	7.58(56.6)	3.57(11.9)	3.40(10.6)	9.12(82.3)	9.75(94.2)	5.39(28.3)	5.57(30.3)
Weed free	1.0(0.0)	1.0(0.0)	1.00(0.0)	1.00(0.0)	1.00(0.0)	1.00(0.0)	1.00(0.0)	1.00(0.0)
Weedy check	9.19(83.7)	10.3(105.5)	4.12(16.0)	4.00(15.1)	13.93(178.3)	11.0(120.3)	6.49(41.3)	6.73(44.3)
LSD(p=0.05)	1.35	1.35	0.59	0.57	1.07	1.24	1.38	0.67

et al. 2015). Similar improvement in production through reduction in weed interference by the pendimethalin+ imazethapyr treatment was reported in dwarf field pea (Shalini and Singh 2014).

Effect on green pod yield

Different weed management treatments registered significant increase in green pod yield compared to weedy check (**Table 4**). Among the weed management treatments, pendimethalin + imazethapyr 1250 g/ha as pre-emergence recorded highest green pod yield (7.37 t/ha for 2016-17 and 7.53 t/ha for 2017-18), which was statistically at par with pendimethalin + imazethapyr 1000 or 800 g/ha as pre-emergence and imazethapyr 70 g/ha as PE during both 2016-17 and 2017-18 crop growing years with respect to green pod yield. It also resulted in 44 to 57% for 2016-17 and 41 to 54% for 2017-18 increase in green pod yield over rest herbicidal weed management treatments. Pendimethalin + imazethapyr 1000 g/ha as pre-emergence was found second best weed management treatment among various weed management treatments in influencing green pod yield. Similar increases in yield through reduction in weed interference by the pendimethalin + imazethapyr 1250 g/ha as pre-emergence treatment was reported in field pea (Shalini and Singh 2014) and chilli (Hajebi *et al.* 2016). The effect might have accentuated from weeds prevention The continuous growth of weeds in the weedy check decreased pea yield by 62.09% in comparison to weed free. The same observations on the effects of pendimethalin fb one hand weeding on yield characteristics and yield were made by Mawalia *et al.* (2017).

Effect on economics

Among the herbicidal weed management treatments, pendimethalin + imazethapyr 1250 g/ha as pre-emergence recorded highest net returns followed by pendimethalin + imazethapyr 1000 g/ha as pre-

Table 3. Effect of different weed management practices on growth and yield attributes in vegetable pea

Treatment	Plant height at 50 DAS (cm)		Plant dry matter at 50 DAS (g/m^2)		No. of nodules/ plant at 50 DAS		No. of pods/plant		No. of seeds/pod	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
Clodinafop 60 g/ha at 2-4 LS	39.97	43.70	2.53	2.75	14.97	15.77	12.43	14.23	6.77	7.00
Pinoxaden 50 g/ha at 2-4 LS	38.87	42.17	2.52	2.78	14.90	15.67	11.77	13.53	6.60	6.83
Pendimethalin at 1.0 kg/ha as PE	45.40	48.80	2.62	2.79	16.33	17.10	14.43	16.27	7.43	7.67
Pendimethalin + imazethapyr at 800 g/ha as PE	46.00	48.23	2.68	2.74	16.52	17.32	15.43	15.87	7.53	7.80
Pendimethalin + imazethapyr at 1000 g/ha as PE	47.83	51.23	2.70	2.70	16.73	17.60	16.06	17.80	7.60	7.90
Pendimethalin + imazethapyr at 1250 g/ha as PE	48.70	51.77	2.72	2.63	17.57	18.40	16.70	18.50	8.00	8.20
Imazethapyr at 70 g/ha as PE	45.63	49.03	2.66	2.66	16.13	16.93	14.63	16.40	7.33	7.53
Imazethapyr at 60 g/ha at 2-4 LS	43.83	47.17	2.61	2.65	15.88	16.68	11.83	13.67	7.23	7.43
Imazethapyr at 70 g/ha at 2-4 LS	45.33	45.27	2.56	2.66	15.53	16.33	13.73	15.53	7.07	7.27
Imazethapyr 80 g /ha at 2-4 LS	45.40	48.80	2.58	2.63	15.83	16.63	14.20	16.00	7.20	7.40
Imazethapyr + imazamox 60 g/ha at 2-4 LS	44.03	47.43	2.57	2.92	15.46	16.26	14.03	15.83	7.03	7.23
Imazethapyr + imazamox 70 g/ha at 2-4 LS	44.30	47.70	2.58	2.12	15.63	16.43	12.30	14.10	6.97	7.17
Imazethapyr + imazamox 80 g/ha at 2-4 LS	40.83	43.80	2.55	2.55	14.10	14.90	12.17	13.97	6.80	7.00
Weed free	51.13	54.30	2.81	2.81	19.23	20.37	17.77	19.57	8.77	9.13
Weedy check	32.07	35.47	2.18	2.18	12.97	13.77	9.27	11.10	5.27	5.50
LSD (p=0.05)	3.86	3.91	0.09	0.12	1.92	1.91	2.42	2.11	0.92	0.76

Table 4. Effect of different weed management practices on green pod yield in vegetable pea

Treatment	Green pod yield (t/ha)		Net returns (x10^3 ₹/ha)		B: C ratio	
	2016-17	2017-18	2016-17	2017-18	2016-17	2017-18
Clodinafop 60 g/ha at 2-4 LS	6.86	6.93	95.83	91.26	2.32	1.93
Pinoxaden 50 g/ha at 2-4 LS	6.75	6.90	92.72	89.48	2.18	1.84
Pendimethalin at 1.0 kg/ha as PE	7.07	7.18	99.19	95.21	2.34	1.96
Pendimethalin + imazethapyr at 800 g/ha as PE	7.16	7.20	99.70	95.46	2.35	1.96
Pendimethalin + imazethapyr at 1000 g/ha as PE	7.28	7.47	102.88	100.40	2.41	2.10
Pendimethalin + imazethapyr at 1250 g/ha as PE	7.37	7.53	104.01	101.03	2.40	2.00
Imazethapyr at 70 g/ha as PE	7.10	7.13	101.27	94.50	2.41	1.96
Imazethapyr at 60 g/ha at 2-4 LS	6.88	7.03	95.94	92.70	2.29	1.93
Imazethapyr at 70 g/ha at 2-4 LS	7.03	7.07	98.74	93.30	2.35	1.93
Imazethapyr 80 g /ha at 2-4 LS	7.08	7.10	99.48	93.38	2.36	1.92
Imazethapyr + imazamox 60 g/ha at 2-4 LS	6.93	7.09	96.43	93.46	2.28	1.93
Imazethapyr + imazamox 70 g/ha at 2-4 LS	6.90	6.99	95.62	91.18	2.25	1.87
Imazethapyr + imazamox 80 g/ha at 2-4 LS	6.87	6.94	94.62	89.92	2.21	1.83
Weed free	7.57	7.79	95.34	83.42	1.73	1.15
Weedy check	4.67	4.89	53.12	51.42	1.31	1.10
LSD (p=0.05)	0.44	0.41				

emergence. However, highest benefit cost ratio was attended in pendimethalin + imazethapyr 1000 g/ha as pre-emergence followed by pendimethalin + imazethapyr 1250 g/ha as pre-emergence and imazethapyr at 70 g/ha pre-emergence (**Table 4**). This might be due to the better management of weeds by these herbicides than other herbicidal treatments.

Based on two-year study, it was concluded that pendimethalin + imazethapyr 1000 g/ha as pre-emergence found economically suitable for weed management option in vegetable pea in Jammu area of India.

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