



# International Journal of Research in Agronomy

E-ISSN: 2618-0618

P-ISSN: 2618-060X

© Agronomy

[www.agronomyjournals.com](http://www.agronomyjournals.com)

2024; SP-7(10): 489-490

Received: 23-08-2024

Accepted: 26-09-2024

## Zine PS

M.Sc. Scholar, Department of Agronomy, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

## Sanap AB

Assistant Professor, Department of Agronomy, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

## Ghule KS

M.Sc. Scholar, Department of Agronomy, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

## Kumare NM

M.Sc. Scholar, Department of Agronomy, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

## Waghmare VD

M.Sc. Scholar, Department of Agronomy, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

## Corresponding Author:

### Zine PS

M.Sc. Scholar, Department of Agronomy, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

## Effect of herbicides on growth attributes of chickpea (*Cicer arietinum* L.)

Zine PS, Sanap AB, Ghule KS, Kumare NM and Waghmare VD

DOI: <https://doi.org/10.33545/2618060X.2024.v7.i10Sg.1830>

### Abstract

Present investigation entitled Effect of herbicides on growth Attributes of chickpea (*Cicer arietinum* L.) was carried out at Agriculture Research Station, Badnapur. situated at 409 m above mean sea level at 19°50 latitude and 47°53" longitudes with an altitude of 520 meters. The soil was clayey in texture, low in phosphorus moderate in available nitrogen and high in potassium and slightly alkaline in reaction The environmental conditions prevailed during experimental period was favourable for normal growth and maturity of chickpea crop.

Experimental results revealed that growth attributes viz., plant height, number of branches plant<sup>-1</sup>, Dry matter plant<sup>-1</sup>. was significantly influenced due to various weed management treatments. Weed free treatment and application of Pendimethalin 38.7% CS (1 kg/ha) + one hoeing at 30-35 DAS recorded significantly superior Growth of Chickpea plants Whereas, weed check recorded lowest growth attributes.

**Keywords:** Chickpea, herbicide, growth

### Introduction

Chickpea (*Cicer arietinum* L.) popularly known as "Gram" or "Bengal gram" is most important and premier pulse crop of India. Chickpea has been well recognized as a valuable source of protein particularly in the developing countries where majority of the population depends on the low-priced food for meeting its dietary requirements. Its magnitude of significance is more among Indians due to their reliance on vegetarian diets besides limited buying capacity of more than 200-250 million (27%) people living below the poverty line. like any other pulses, supplementation of chickpea with cereal based diets is considered one of the possible solutions to the problems associated with protein energy malnutrition (PEM). The daily availability of 14 gm chickpea is source of approximately 2.3% (56 K cal.) energy and 4.7% (2.7 gm) protein to Indian population besides being a major source of calcium and iron (10-12%).

Chickpea is the third most important grain legume in the world after dry beans and dry peas at global level. Its cultivation is mainly confined to Asia with 90% of the global area and production. Besides Asia, it is also grown in North and Central America, the Mediterranean region, the West Asia and North Africa (WANA) region and Eastern Africa Recently, the crop has expanded in new niches such as Australia and Canada.

Among the pulse, the chickpea is a first important *Rabi* pulse crop of the region. In 2016-2017 estimated area and production of Chickpea in India is 9.90 million ha and 9.12 million tone. The productivity is 969 kg /ha (2016-2017). In 2017-2018 estimated area and production of Chickpea in Maharashtra is 19.88 lakh ha and 18.81 lakh tone. In Maharashtra, highest chickpea crop is grown on 19.29 lakh ha with the highest production of 19.41 lakh tones (2016-2017). The productivity is also highest during 2016-2017 (1006 kg/ha). Percentage of area increased during this year as compared to previous year is 10.8% of India and 2.96% area in Maharashtra respectively. Maharashtra is having 14.69% contribution in the area with 13.74% production share of the nation (average of last ten years).

Weeds effect on growth, yield and quality of crop plants and reduce the soil fertility, available soil moisture and nutrients and also compete for space and sunlight with the crop plants. Weeds pose severe competition to chickpea crop under rainfed as well as irrigated conditions. Losses in seed yield due to weeds have been estimated 40-87% (Saxena *et al.* 1976, Ahlawat *et al.* 1981,

Yadav *et al.* 1983, Vaishya *et al.* 1999) [5, 1, 7, 6] in view of this present investigation was carried out to study performance of herbicides in chickpea,

### Material and Methods

The present field experiment was conducted during *Rabi* season of 2018-19 at the Experimental Farm of Agronomy at Agriculture Research Station, Badnapur, Jalna (Maharashtra), Vasantrao Naik Marathawada Krishi Vidyapeeth Parbhani. The initial soil sample analysis the experimental plot was clayey in texture, moderate in available nitrogen (180.36 kg ha<sup>-1</sup>), low in available phosphorus (14.36 kg ha<sup>-1</sup>), high in available potassium (460.59 kg ha<sup>-1</sup>). The soil was slightly alkaline in reaction (7.96 pH). The experiment was laid out in Randomized Block Design with three replications. The treatments were (T<sub>1</sub>) - Pendimethalin 30 EC (1.0 kg/ha) PE + one hoeing at 25-30 DAS, (T<sub>2</sub>) Pendimethalin 38.7 CS (1.0 kg/ha) PE, (T<sub>3</sub>) - Pendimethalin 38.7 CS (1.0 kg/ha) PE + one hoeing at 30-35 DAS, (T<sub>4</sub>) Fenoxypyr ethyl 9.3% w/w (60 g/ha) POE at 25-30 DAS, (T<sub>5</sub>) Pendimethalin 30EC + Imaze 2% (RM. 1.0 kg/ha) PE, (T<sub>6</sub>) Pendimethalin 30EC + Imaze 2% (RM. 1.0 kg/ha) PE+ one hoeing at 30-35 DAS, (T<sub>7</sub>) Pendimethalin 38.7 CS (1.0 Kg/ha) PE + Imazethapyr 2% (Tank mix 1.0 kg/ha), (T<sub>8</sub>) One

hoeing at 30-35 DAS, (T<sub>9</sub>) Weed Free (two hand weeding at 25-30 DAS and 30-35 DAS) and (T<sub>10</sub>) Weed check.

Sowing was done by dibbling. The gross and net plot size was 3.60 x 6.20 m and 3.0 x 5.8 m respectively. The recommended dose of fertilizer was 25:50:00 kg NPK ha<sup>-1</sup> applied as per treatments through Urea and SSP. Other cultural practices were done as per treatments. Statistical analysis of the data was carried out by using standard analysis of variance (Panse and Sukhatme 1967) [3].

### Results and Discussion

#### Effect of herbicides on growth of chickpea

The results regarding plant height, number of branches plant<sup>-1</sup> and total dry matter production plant<sup>-1</sup> of chickpea were presented in table 1. Weed free plot (T<sub>9</sub>) recorded significantly more plant height (44.80), however, it was at par with pendimethalin 38.7 CS @ 1 kg ha<sup>-1</sup> + one hoeing (T<sub>3</sub>), (T<sub>6</sub>) Pendimethalin 30 EC + Imaze 2% @ 1 kg ha<sup>-1</sup> + one hoeing at 30-35 DAS, (T<sub>1</sub>) Pendimethalin 30 EC @ 1 kg ha<sup>-1</sup> + one hoeing at 25DAS - 30DAS. The lowest plant height, number of branches plant<sup>-1</sup> and dry matter production plant<sup>-1</sup> were observed in (T<sub>10</sub>) weed check treatment. Similar results reported by Rathod P.S. *et al.* (2017) [4] Kaushik *et al.* (2014) [2].

**Table 1:** Effect of different herbicides on growth characteristics of Chickpea

Treatments	Height plant <sup>-1</sup>	Branches plant <sup>-1</sup>	Dry matter plant <sup>-1</sup> (g)	No. of pods plant <sup>-1</sup>
T <sub>1</sub> - Pendimethalin 30 EC (1.0 kg/ha) PE+ one hoeing at 25-30 DAS	42	7.72	25.3	57.2
T <sub>2</sub> - Pendimethalin 38.7 CS (1.0 kg/ha) PE	39.23	7.4	24.83	55.23
T <sub>3</sub> - Pendimethalin 38.7 CS (1.0 kg/ha) PE + one hoeing at 30-35 DAS	44	8.30	26.53	59.07
T <sub>4</sub> - Fenoxypyr ethyl 9.3% w/w (60 g/ha) POE at 25- 30 DAS	37.43	6.87	23.25	53.03
T <sub>5</sub> - Pendimethalin 30 EC + Imaze 2% (RM.1.0 kg/ha) PE	38.03	7.13	24.37	54.20
T <sub>6</sub> - Pendimethalin 30 EC + Imaze 2% (RM.1.0 kg/ha) PE+ one hoeing at 30-35 DAS.	42.39	7.99	25.33	58.06
T <sub>7</sub> - Pendimethalin 38.7 CS (1.0 kg/ha) PE + Imazethapyr 2% (Tank mix 1.0 kg/ha).	39.64	7.60	25	56
T <sub>8</sub> - One hoeing at 30-35 DAS.	33.70	6.73	22.87	52.87
T <sub>9</sub> - Weed free (Two hand weeding at 25-30 DAS and 30- 35 DAS)	44.80	8.60	28.50	60
T <sub>10</sub> - Weed check	30.56	6.63	20.76	36.58
SE ± m	2.20	0.37	1.17	2.63
C.D. at 5%	6.53	1.10	3.49	7.80
General Mean	39.18	7.50	24.68	54.23

### Conclusion

The study on the impact of herbicides on chickpea growth revealed that weed management significantly influences the plant's height, number of branches, and dry matter production. Among the treatments, the weed-free plot (T<sub>9</sub>) showed the best performance, with the highest plant growth, which was statistically at par with Pendimethalin-based treatments combined with hoeing. On the other hand, unchecked weed growth (T<sub>10</sub>) resulted in the lowest growth parameters. This indicates that effective weed control, particularly through the use of Pendimethalin with hoeing or hand weeding, can substantially enhance chickpea growth and productivity.

### References

- Ahluwalia IPS, Singh A, Saraf CS. Effects of winter legumes on the nitrogen economy and productivity of succeeding cereals. *Experimental Agriculture*. 1981;17:57-62.
- Kaushik SS, Rai AK, Sirothia P, Sharma AK, Shukla AK. Growth yield and economics of rainfed chickpea as influenced by integrated weed management. *Indian Journal of Natural Products and Resources*. 2014;5(3):282-285.
- Panse VG, Sukhatme PV. *Statistical methods for*

agricultural workers. New Delhi: Indian Council of Agricultural Research; c1967. p. 187-197.

- Rathod PS, Patil DH, Dodamani BM. Integrated weed management in chickpea (*Cicer arietinum* L.) under rainfed conditions of Karnataka, India. *Legume Research*. 2017;40(3):580-585.
- Saxena MC, Subramaniyam KK, Yadav DS. Chemical and mechanical control of weeds in gram. *Pantnagar Journal of Research*. 1976;1:112-116.
- Vaishya RD, Rai OP, Singh SS. Weed control in chickpea with pre-emergence herbicides in eastern Uttar Pradesh. *Indian Journal of Pulses Research*. 1999;12(2):197-200.
- Yadav SK, Singh SP, Bhan VM. Weed control in chickpea. *Tropical Pest Management*. 1983;29:297-298.