Effect of Different Organic Weed Management Practices on Growth of Maize (Zea Mays L.)

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Abstract: The field experiment was conducted during (Kharif) 2022 at Experiment farm of Agronomy Department, Shri Guru Ram Rai University, Dehradun. To study 'Effect of Organic Weed Management Practices on Growth of Maize (Zea mays L.)'. The experiment was laid out in a randomized block design with eight treatments and three replications. In the field experiment organic weed management practices Pre and Post emergence herbicides treatments viz.; (T1)Farners practices, (T2)Weedy check control, (T3)One hand weeding, (T4)Mechanical weeding, (T5)Weed mulch, (T6)Wheat straw mulch, (T7)Two hand weeding, (T8)Green leaf mulch. Results indicated that the (T1)Farmers practices + (T7)Two hand weeding+ (T6)Wheat straw mulch was found significantly superior over the rest of treatments in respect of growth.

INTRODUCTION

Maize, also known as corn, is a widely cultivated cereal grain and one of the most important stable crops in the world. It is native to the America and has been cultivated for thousands of years by indigenous civilization. Maize is characterized by its tall stalks, large ears, and kernels that can be yellow, white, or various shades of red and blue. Maize is versatile crop with various uses. It serves as a primary food sources for humans and animals, and its derivatives are used in a wide range of products, including livestock feed, cooking oil, starch, and industrial materials. The plants itself is often grown as a forage crop for livestock. In terms of agriculture significance, maize is a high-yielding and resilient crop that can be grown in a variety of climates and soils. It is well-suited for both small-scale farming systems, making it an essential crop for food security and economic development in any regions. The cultivation of maize involves several stages. Maize is a highly adaptable crop and can be grown in various climatic conditions, ranging from temperate to tropical regions. It is an annual plant that typically reaches heights of 1.5 to 3 meters (5 to 10 feet) and has long, narrow leaves. The plants produces both male and female flowers, with the ears of corn developing from the female flowers. The maize plant produces grains, commonly referred to as kernels, which are the edible part of the crop. These kernels come in various colors, including yellow, white, red, and blue, depending on the maize variety. Maize kernels are rich in carbohydrates, dietary fiber, and essential nutrients like vitamins A, vitamins C, and potassium. Maize is used for a wide range of purpose, including human consumption, livestock feed, and industrial applications. In many parts of the world, maize is a stable food and is consumed in various forms, such as whole kernels, ground into flour, or processed into cornmeal, corn oil, and corn starch. It is also an important ingredient in many food products, such as breakfast cereals, snacks, and beverages. In addition to its food uses, maize is utilized in the production of animal feed due to its high energy content. Livestock, such as poultry, cattle, and pigs, are commonly fed maize to meet their nutritional requirements. Furthermore, maize is a valuable source of raw material for various industries, pharmaceuticals, and the manufacturing of biodegradable plastics. Maize cultivation involves several agricultural practices, including land preparation, planting, fertilization, pest and weed control, and harvesting. Modern agricultural techniques, such as hybrid maize varieties, genetic engineering, and precision farming, have significantly increased maize yields and improved resistance to pest and diseases. The global production of maize has steadily increased over the years, with major maize producing countries including the United State, China, Brazil, Mexico, and Argentina. Maize plays a crucial role in food security and economic development, providing livelihoods for millions of farmers worldwide. Overall, maize is a versatile crop with immense importance in agriculture, food production, and various industries. Its widespread cultivation and utilization make it a significant contribution to global food security and economic growth. When its comes to organic weed management practices on maize (also known as corn), there are several strategies you can employ to controls weeds without

relaying on synthetic herbicides.. Remember, effective weed management in organic systems requires an integrated approach, combining multiple strategies to achieve the best results. Its important to understand the specific weed species present in your region and adapt your weed management practices accordingly. A wide spaced crop suffers from heavy weed infestation due to slow initial growth particularly during Kharif season. Weeds utilise a lot of growth factors, which aren't available to the crop. Some of the grassy weeds found in maize field *are Cyperus rotundus L., Cynodon dactylon, Commelina benghalensis, Amaranthus viridis, Denebra Arabica, Tridax procumbens L., Euphorbia hirta L., Parthenium hysterophorus L. and Celosia argentina* are among the deadly weeds of the world infest the maize field and thus, increase the cost of production, as hand weeding is not effective against these weeds.

MATERIALS AND METHODS

A field experiment entitled "EFFECT OF DIFFERENT ORGANIC WEED MANAGEMENT PRACTICES ON MAIZE " was conducted during summer (Kharif) season of 2021-22 at Agricultural Research Farm, Department of Agronomy, Shri Guru Ram Rai University , Dehradun, Uttarakhand (India), situated in the northwestern part of the state in the foothills of himalayas . The Agricultural Research Farm of Shri Guru Ram Rai University is situated at about 5 kilometre distance from Dehradun railway station in the South-East direction. The geographical situation of the farm lies in the North-Gangetic Alluvial plain at 250 18' North latitudes, 830 03' East longitude and at an altitude of 128.93 meters above the mean sea level. The said field of experiment was represented ideal spatial unit corresponding to textural make up and fertility status and well connected with irrigation channel for timely use. The Dehradun lies on 674m above sea level. In Dehradun, the climate is warm and temperate. The rain in Dehradun falls mostly in the winter, with relatively little rain in the summer. This climate is considered to be Csa according to the Köppen-Geiger climate classification. In Dehradun, the average annual temperature is 21.8 °C | 71.2 °F. About 1896 mm | 74.6 inch of precipitation falls annually.The climate of Dehradun is humid subtropical. It varies greatly from tropical to severe cold depending upon the altitude of the area. The city is hilly, temperature variations due to difference in elevation are considerable. In the hilly regions, the summer is pleasant. In general, the rainfall situation during the experimental period was not satisfactory. About a week before sowing, no rain was received which permit the use of pre-sowing irrigation to mustard. The actual rainfall during the period of investigation in the cropping year 2019-20 was only 22.1 mm. The dry spell prevailed in the mid vegetative growth periods. Light showers were received in the 48th and 1st Julian weeks. The weekly mean maximum and minimum temperature during the experimentation ranges from 14.20C to 28.00C and 4.80C to 19.30C, respectively. The maximum temperature 25.00C was recorded in the month of November, whereas the minimum temperature 6.80C was observed in the month of January. Prior to laying out experiment in the field, random soil samples from 0-15 cm soil depth were drawn to evaluate the initial fertilit y status of the soil of the experimental field. The recommended mustard variety "DHS-42" was selected in the present study. It is a hybrid variety of maize. The duration of the variety is about 70 days. It is a variety of Pro Agro Seed Co. Pvt. L.td. Its gives higher yield as compare to other varieties of maize in one plant it can produce 15 corns as I observed in my Research. Considering the nature of factors under study and the convenience of agricultural operation and efficiency, the experiment was laid out in Randomized Block Design (RBD) comprised of eight treatments combination along with three replications. Each replication was divided into twenty- four equal plots and the treatments were randomly allocated within them. (T1)Farners practices, (T2)Weedy check control, (T3)One hand weeding, (T4)Mechanical weeding, (T5)Weed mulch, (T6)Wheat straw mulch, (T7)Two hand weeding, (T8)Green leaf mulch

RESULTS AND DISCUSSION

The results as well as discussion of the various treatments have been presented under following heads:

Effect of weed on growth

Growth characters like mean plant height (cm), number of functional leaves, and dry matter accumulation (g) per plant of maize showed a significantly for different treatments are tabulated in Table 1. Treatment (T6) Wheat straw mulch and (T7) Two hand weeding produced more plant height than other treatment. This is might be due to the fact

that weeds suppressed the vegetative growth of plants by the competition between crop and weeds for soil moisture, plant nutrients, solar radiation and space during active growth period.The mean number of functional leaves per plant directly indicates the behavioral adaption. Treatment (T6) Wheat straw mulch and (T7) Two hand weeding proved superior over all the treatments in producing more functional leaves plant-1. This might be due to good availability of moisture. Treatment Treatment (T6) Wheat straw mulch and (T7) Two hand weeding recorded more dry matter accumulation than other treatment in maize.

Table: 1 Effect of weed management practices on growth parameters of maize

Treatment	Plant height(cm)	No. of functional leaves plant-1	Leaf area (dm2) plant-1	Dry matter (g) plant-
Farmers practiced	297.7	8.11	1.67	242.5
Weedy check (Control)	210.6	8.03	2.01	235.5
One hand weeding	230.5	8.64	1.75	257.8
Mechanical weeding	250.8	9.26	1.89	277.8
Weed mulch	238.6	9.52	1.97	286.8
Wheat straw mulch	318.7	9.08	1.84	269.2
Two hand weeding	312.6	9.76	1.62	295.8
Green leaf mulch	298.5	8.28	2.05	287.8
SEm±	4.58	0.34	0.05	6.25
CD (P=0.05)	10.5	0.89	0.15	18.6

CONCLUSION

This experiment illustrated that maize growth parameters, were significantly influenced by the various treatments of weed management practices. The combination of chemical plus cultural treatment (T6) Wheat straw mulch and (T7) Two hand weeding had recorded higher plant growth characters than rest of treatments. On the basis of single year experiment results, it can be concluded that has significant positive effect on growth characters of maize crop as compared to rest of the treatments.

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