International Journal of Agriculture and Plant Science
www.agriculturejournal.in
Online ISSN: 2664-7664, Print ISSN: 2664-7656
Received: 17-06-2024, Accepted: 11-07-2024, Published: 03-08-2024
Volume 6, Issue 3, 2024, Page No. 25-27

Effects of the herbicide isopropopil amina glifosat 480 g/l on weeds, inventions and charges of *zea mays saccharata* L. with without tillage

Yayan Sumekar[1*], Rani Andriani Budi Kusumo[1], Wirman Santoso[2], Resti Fajarfika[2], Ardli Swardana[2]
[1] Faculty of Agriculture, Universitas Padjadjaran, Jl. R. Bandung-Sumedang, Jatinangor, Indonesia
[2] Faculty of Agriculture, Garut University, Garut, Indonesia

Abstract
The presence of weeds in corn crops can cause their growth to be disrupted and result in decreased yields. Weed control in soil-free systems can use herbicides that can inhibit growth and kill weeds. The purpose of this research is to find out the herbicide and dosage isopropyl amine glyphosate 4800 g/l that effectively controls the weeds of corn crops as well as has an effect on the growth and yield of sweet corn plants. The research has been conducted from March to May 2024. The study used a random group plan with 6 treatments and was repeated 4 times using the active herbicide isopropyl amine glyphosate 480 g/l at dosage. A = 1.5 l/ha; B = 2,0 l/h; C = 2.5 l/ho; D = 3.0 l/he; E = manual emission F = Perfect Soil Cultivation. The results of the study suggest that there is an influence of the dose of Isopropyl Amin Glyphosate 4800 g/l on the growth of weeds. Effective doses were found in the treatment of herbicides Isopropyl Amina Glifosate 480 g/l with doses of 2.0; 2.5; 3.0 l/ha suppressing the growth of weeds Alternanthera ficoidea, Ludwigia palustri, Asystasia gangetica, and Bidens pilosa. As well as giving the best effect on the growth with a dose of 3.0 l / ha, and providing the best impact on the yield of maize with a dosage of 2,0l /ha.

Keywords: Application, weeds, isopropylamine glyphosate 480 g/l, sweet corn

Introduction

Sweet maize is the most popular vegetable commodity in the United States and Canada. Consumption of sweet maize has also increased in Asia, Europe and Latin America as well as many other countries, including Indonesia. In the United States, this commodity is a symbol of summer. Sweet corn is also very popular as a fresh or processed vegetable. (Syukur, 2013) [19].

According to data from the Central Statistics Agency (2021), sugar corn production over the past five years has been fluctuating. In 2017 it was 1,741,257 tons, in 2018 it was 1,710,784 tonnes, in 2019 it was 1,960,424 tonnes, and in 2020 it is 1,965,444 tonnes and in 2021 it will be 1,724,398 tonnes. To date, corn production in Indonesia has not been able to meet national corn needs due to low land productivity. One of the causes of low corn production is the presence of weeds that interfere with corn crops (Fauzi, 2020) [6].

The crop is a plant that grows in an area that the farmer does not want, so that its presence can harm the main crop. One of the causes of low corn yields is the presence of weeds in the corn crops. The influence of weeds on plants can occur directly, competing for the elements of harvest, water, light and growing space. Weeds left uncontrolled on corn can reduce yields by 20-80%. (Bilman, 2011) [3].

TOT systems in land and water use can be preserved, energy, costs, and time can also be saved. In fact, the amount of labor needed could be suppressed and farmers' incomes increased. (Isnaini dan Hermawan, 1998) [8]. According to Craff's and Reynor (2001) [4], the increase in production costs is due to the high expenditure on weed control on crop crops. If control is not carried out, the harvest will be reduced by 18-60%. In an effort to reduce the cost of grass control and processing on corn land, it is now possible to use a land-free system (TOT) that can reduce the costs of production. The TOT crop system is a land processing system that allows soil surfaces without soil processing so that all plants on the surface of the soil remain intact, except the place of planting and irrigation. The cultivation system takes great care of managing the conservation of soil and water carefully, but still provides an optimal planting ground for crops. Implementation of such systems can have a positive impact on plants because with the presence of vegetables left on the surface of the soil can increase soil and water harvest and other positive effects (Utomo, 2012) [20]

Glyphosate is an active ingredient that belongs to the group of active substances of organophosphorus compounds. Glifosate has the following characteristics: has a very high solubility to water; but is insoluble to organic solvents; does not evaporate, works effectively on most wide leaf weeds; and grass weeds and is included in non-selective herbicides. (Hall *et al*, 2014) [7].

The purpose of this study is to find out the effectiveness of the herbicide Isopropyl Amina Glifosate 480 g/l controlling the weeds of corn crops as well as having a good effect on the growth and yield of sweet corn (*Zea mays saccharate* L) and to know the dosage of the active ingredient herbiside isopropil amina Glyphosate is effective against the suppression of weeds and gives the best results for the growth of and the yields of sweet maize crops. (*Zea mays saccharate* L.).

Material and methods

The experiment was carried out in the experimental garden of the Faculty of Agriculture, University of Padjadjaran Jatinangor, Sumedang district, West Java in March to May 2024. The location of the experiment has an altitude of about ±820 meters above sea level. (mdpl). The tools used are semi-automatic back spray and T-set nozzles, measuring glasses, pipettes, analytical scales, ovens, writing tools and documentation tools. (Kamera). The materials used in this

test are paragon sweet corn seeds, urea fertilizer, KCL, TSP, and isopropyl amine glyphosate 480 g/l. This study used a random group scheme with 6 treatments used as follows:A = Isopropyl Amine Glyphosate 480 g/l at a dose of 1.5 l/ha,B = Isopropyl Amin Glifosate 480 g/l at a dosage of 2.0l/h,C = Isoprophyl Amina Glyophosate 480 g/h at a dosis of 2.5 l/he,D = ISopropyle Amine glyphosates 480 g/l with a dose Of 3,0 l/h and E = Manual Extrusion F= Perfect Soil Cultivation. Herbicide application is done 3 weeks after application.

Observed parameters of dry weights of weeds were observed at week 3 and 6 weeks after application, cultivation height of corn was observed on 1, 3, and 5 weeks after application with corn yield per hectare weighed with the clobot. The effects of treatment in this study were tested statistically with a scale analysis at 0.05, if there were differences in the scale of treatment then in the Advanced Trial with the Duncan Double Distance Trial at the level of 5%

Results and discussion

Dry weight observation

1. Total weed dry weight

This result means that the observation of the total dry weight of weeds presented in Table 1 on observation 3 MSA can be seen that the dry weight of weeds in the control is greater and significantly different from other treatments. In 3 and 6 weeks after application only a dose of 2.5 l/ha differed markedly from the control. So it can be said that the isopropyl herbicide Amina Glyphosate has not been effective in controlling total weeds. This is because the weeds produced are larger than manual and control weeding treatments.

Table 1: Total weed dry weight

Isopropyl amine glyphosate treatment 480 g/l	Dosage (l/ha)	weeks after application observations	
		3	6
A	1.5	1.69 b	6.19 b
B	2.0	1.67 b	6.42 b
C	2.5	0.85 a	3.42 a
D	3.0	1.44 b	4.19 b
E	Manual weeding	2.08 c	11.58 c
F	control	12.14 d	20.93 d

Remarks: The average value marked with the same letter in the same column shows no significant difference at the level of 5% according to the Duncan test.

The purpose of weed control on sweet corn plants is to reduce weed populations so that they do not compete with corn plants in competing for nutrients, sunlight, water, carbon dioxide, and growing space so that they do not suppress plant growth, the application of glyphosate herbicides on sweet corn plants is one of the chemical weed control techniques, this is strengthened by Umiyati and Widayat, (2017) [16] The scramble for nutrients occurs due to the growth of weeds around cultivated plants which causes losses both in quantity and quality due to competition and allelopathy The presence of weeds causes a decrease in plant growth.

2. Height of corn plants

Table 2 shows that the application of glyphosate herbicide at doses of 2.0 and 3.0 l/ha has the best effect on the high yield of corn plants, at that dose, the herbicide can work effectively in suppressing weed growth that causes corn plants to grow properly.

Table 2: Tinggi tanaman

Isopropyl amine glyphosate treatment 480 g/l	Dosage (l/ha)	weeks after application observations		
		1	3	6
A	1.5	6.12 d	25.1 a	82.06 d
B	2.0	5.66 b	32.0 c	81.90 c
C	2.5	5.70 b	28.0 b	80.26 b
D	3.0	5.77 b	29.0 b	84.02 d
E	Manual weeding	5.33 b	26.3 a	77.68 a
F	control	4.93 a	25.1 a	72.58 a

Remarks: The average value marked with the same letter in the same column shows no significant difference at the level of 5% according to the Duncan test.

The application of glyphosate herbicide with a dose of 2.5 l/ha does not poison cultivated plants so that corn plants grow well, according to the question of Sukman and Yakup (2002) [14] in the research of Hafsah *et al,* (2019) [12] stated that glyphosate is an organic herbicide that is very easy to utilize by soil microorganisms so that it does not harm and can even support the environment that can make plant growth well. According to Daud and David (2008) [5], the dose of glyphosate herbicide that cannot harm plants in the dosage range of 2 – 4 l/ha, in addition to not harming plants, the dose can increase the growth of corn plants.

3. Corn Crop Yield

Competition between plants and weeds in obtaining nutrients, water and sunlight causes disruption of the photosynthesis process can result in plants becoming deficient in nutrients to produce good cobs This is in accordance with the opinion of Seriminawati (2005) in Yayan Sumekar and Widayat (2017) [16] good growth and supported by sufficient nutrient absorption resulting in photosynthes produced will increase and be stored in the storage network so that affect the development and growth of plant parts which will eventually increase crop yield

Table 3: Klobot cob weight

Isopropyl amine glyphosate treatment 480 g/l	Dosage (l/ha)	Cob WEIGHT
A	1.5	3.06 b
B	2.0	3.46 b
C	2.5	2.91 b
D	3.0	2.73 b
E	Manual weeding	3.24 b
F	control	1.96 a

Remarks: The average value marked with the same letter in the same column shows no significant difference at the level of 5% according to the Duncan test.

Table 3 shows that the treatment using the herbicide Isopropyl Amina Glyphosate with a dose of 1.5 to 3.0 l/ha has the highest corn yield compared to other treatments. This is because the dose of isopropyl amine glyphosate herbicide has been able to suppress the growth of weeds to the roots and plant tissues in the soil so that weeds cannot grow again. In addition to controlling weeds, this herbicide can also increase the nutrients of organic matter in the soil (Niswati *et al*,.1995) [11] in the research of Hafsah, *et al.* (2019) [12]. Good plant growth allows yields that are in line with their yield potential (Triyono 2010).

Conclusion

Based on the results of this experiment, it can be concluded that the herbicide with the active ingredient Isopropyl Amina Glyphosate 480 g/l is effective in controlling weeds on sweet corn plants with the TOT system and affects the growth and yield of sweet corn plants and the dose of herbicide with the active ingredient Isopropyl Amina Glyphosate 4800 g/l at a dose of 1.5 l/ha is effective and efficient in suppressing the growth of weeds *Alternanthera ficoidea, Ludwigia palustris, Aystasia gangetica, and Bidens pilosa* and can increase the growth and yield of sweet corn

References

1. Badan Pusat Statistik (BPS). Produksi Jagung Menurut Provinsi (ton), 2021, 1993-2015. https://www.bps.go.id. Diakses pada tanggal 4 januari 2024.
2. Bangun P, dan H Pane. Pengendalian gulma pada budidaya jagung.Pusat Penelitian dan Pengembangan Tanaman Pangan. Bogor, 2012.
3. Bilman. Analisis Pertumbuhan Tanaman Jagung (Zea mays L.), Pergeseran Komposisi Gulma pada Beberapa Jarak Tanam, 2011.
4. Craff R, dan Reynor KN. Weed Kontrol Atext Book and Manual econd Edition. Me. Grow-Nill Book Company Indonesia. New York. Toronto London, 2001.
5. Daud dan David. Uji Efikasi Herbisida Glifosat Pada Sistem Tanpa olah tanah Terhadap Tanaman Jagung. Prosiding seminar Ilmiah Komisariat daerah. Sulawesi selatan, 2008.
6. Fauzi OF. Kemampuan Kompetisi Beberapa Varietas Tanaman Jagung Manis (Zea mays var.saccharata) Terhadap Gulma. Skripsi. Universitas Muhammadiyah Purwokerto, 2020.
7. Hall L, Beckie H, dan Wolf TM. How Herbisida Work Biology to Application. Alberta Agriculture and Rural Development, Canada. 129 hlm, 2014.
8. Isnaini S, dan W, Hermawan. Budidaya Padi Sawah dengan Sistem Tanpa olah tanah di Kedaloman, Talang Padang, Lampung. 1998. Prosiding Seminar Nasional. Budidaya Pertanian Olah Tanah Konservasi Padang 24-25 Maret 2998, 1998.
9. Mukarromah L, Sembodo DR, dan Sugiatno S. Efikasi Herbisida Glifosat Terhadap Gulma Di Lahan Tanaman Kelapa Sawit (Elaeis guineensis Jacq.) Belum Menghasilkan. Jurnal Agrotek Tropika, 2014, 2(3).
10. Ngawit IK, Fauzi T, dan Muliani K. Keanekaragaman Gulma Berdaun Lebar dan Prediksi Kehilangan Hasil Tanaman Kedelai (Glycine max L. Merrill.) Akibat Kompetisinya di Lahan Kering. Jurnal Ilmiah Mahasiswa Agrokomplek,2023:2(2):266-275.
11. Niswati A, SG Nugroho, dan M Utomo. Pengaruh aplikasi herbisida glifosat terus menerus selama lima belas musim dalam praktek tanpa olah tanah terhadap populasi mikrobia tanah.Prosiding Seminar Nasional V BDP OTK, 1995, 140–148.
12. Bandar Lampung, Dalam Hafsah S, Hasanuddin Vonna M. Respon Tanaman Jagung Terhadap Beberapa Metode Pengendalian Gulma di Lahan Tanpa Olah Tanah. Jurnal Agrista, 2019, 23(1).
13. Putri AA. Pengaruh Ekstrak Umbi Talas (Colocasia esculenta L) sebagai Bioherbisida terhadap Perkecambahan dan Pertumbuhan Gulma Asystasia gangetica. Skripsi. Universitas Lampung, 2022.
14. Sukman Y, dan Yakup. Gulma dan teknik pengendalian. PT. Raja Grafindo Persada. Jakarta, 2002.
15. Dalam Hafsah S, Hasanuddin Vonna M. Respon Tanaman Jagung Terhadap Beberapa Metode Pengendalian Gulma di Lahan Tanpa Olah Tanah. Jurnal Agrista, 2019, 23(1).
16. Sumekar Y, dan Widayat DRDD. Pengaruh Herbisida Atrazine+ Nicosulfuron Terhadap Pengendalian Gulma Dan Hasil Tanaman Jagung (Zea Mays L.) The Impact Of Atrazine+ Nicosulfuron Herbicide On Weed Control And Corn (Zea mays L) Yield, 2017.
17. Sumekar Y, Widayat D, dan Aprillia I. Efektivitas herbisida paraquat diklorida 140 g/l terhadap penekanan gulma, pertumbuhan, dan hasil jagung (Zea mays L). Agrivet: Jurnal Ilmu-Ilmu Pertanian Dan Peternakan (Journal of Agricultural Sciences and Veteriner), 2021, 9(1).
18. Susanto U. Efikasi Herbisida Parakuat Diklorida Terhadap Pertumbuhan Gulma Dan Tanaman Serta Hasil Tanaman Jagung (Zea mays) Pada Sistem Tanpa olah tanah (TOT), 2023.
19. Syukur M, Azis Rifianto SP. Jagung manis. Penebar Swadaya Grup, 2013.
20. Utomo M. Tanpa Olah Tanah: Teknologi Pengelolaan Lahan Kering. Lembaga Penelitian Universitas Lampung, Lampung. Hlm, 2012, 32–33.