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Effect of Ametryn Herbicide and Soil Organic Matter Content on Weed Growth, Herbicide Persistence, and Yield of Sweet Corn (*Zea mays*)

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Abstract: This study examines the impact of weeds on sweet corn, where weeds compete for essential elements, such as nutrients, water, sunlight, and space for growth. In general, the use of herbicides is meant to suppress weed growth. Soil organic matter is important for plant growth and affects herbicide persistence. This study aimed to explore the interaction between ametryn herbicide and soil organic matter content and its impacts on weed growth, herbicide persistence, and sweet corn yield. The experiment was initiated in 2022 at the Experimental Station of the Faculty of Agriculture, Padjadjaran University, Indonesia, using a Split-Plot Design in a Randomized Complete Block Design (RCBD), with three replicates. The experiments consisted of three levels of organic matter, i.e., low, medium, and high, and six levels of ametryn herbicide at 0.0 (control), 0.5, 1.0, 1.5, 2.0, and 2.5 kg a.i./ha. The results indicated that the apparent interaction between ametryn herbicide doses of 1.5, 2.0, and 2.5 kg a.i./ha and the three levels of the organic matter content totally suppressed weed growth. However, the effects of the interaction between ametryn herbicide and organic matter content on the herbicide persistence and the sweet corn yield were not obvious. Ametryn yielded excellent positive results on sweet corn yield. Bioassay analysis showed that the lowest persistence of ametryn herbicide was in line with the highest content of organic matter.

Keywords: bioassay; chemical weeding; nutrient competition; straw compost; weed suppression

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1. Introduction

Maize is an important food source with significant economic value, second only to rice as a source of carbohydrates and proteins [1]. Apart from being a food ingredient, sweet corn (*Zea mays* L.) is also used for animal feed and raw material for the feed industry [2]. In Indonesia, most of the demand for sweet corn is as raw materials for animal feed (55%), food raw materials (30%), and raw materials for other industries and seeds (15%) [3]. The popularity of sweet corn in Indonesia is due to its high nutritional contents, high economical value in the market, as well as its relatively rapid production period [4]. Limited production of sweet corn in Indonesia has resulted in the country's steady import of the commodity. According to the data from Central Bureau of Statistics [5], the sweet corn imports in Indonesia in 2018 reached 517.5 thousand tons, increasing by 42.46% to 737.2 thousand tons in 2019.

One of the reasons for the decline in sweet corn productivity in Indonesia and the dependence on imports is the weed problem in sweet corn fields. Weeds can cause a yield decrease as they compete for resources, such as growing space, water, and sunlight, with the sweet corn plants [6]. If the weeds are not controlled properly, the productivity of sweet corn will be disrupted [7], whereby losses can be as high as 10–20% [8]. Chemical weeding using herbicides [9] has been a common practice in agriculture. Use of the herbicides must be performed appropriately, including the dose, type, target, quality, time of application, and method of application [10]. In addition, continuous use of herbicides should be avoided because it can increase herbicide residues in the soil, which will in turn affect soil fertility and crop productivity. An effective herbicide is ametryn-based products. They are systemic and selective for controlling weeds in a number of crops, such as sugar cane, pineapple, banana, corn, and potatoes [11]. Ametryn herbicides are active in the soil for 11 to 110 days [12]. They belong to the triazine class, which ranks first in the world herbicide market because of their broad spectrum and low price [13]. Consistent overuse of ametryn, however, may contaminate soil and affect crop production and food safety [14].

Herbicide persistence—the period in which a herbicide maintains its activity in the soil—is influenced by many factors, including soil organic matter, volatilization, photodecomposition, adsorption, leaching, degradation by microbes, and uptake by plants [15,16]. Ametryn shows greater persistence in the soil at 70 days after application [17]. Organic matter can improve soil physical, chemical, and biological properties [18]. Unfortunately, its content in agricultural land in Indonesia is generally low [19]. Organic materials, such as rice straw compost, can also help increase the soil organic matter content, improve the accessibility of essential nutrients to plants, and retain water in the soil [20]. In addition, organic matter can also increase microbial abundance in the soil, as measured by soil respiration [21]. The higher the organic matter content, the more energy sources available for soil organisms, so their activity increases [22]. In addition to organic matter, the activity of soil microorganisms is also influenced by moisture, aeration, and energy sources [23]. However, addition of organic matter may reduce herbicide residue and its activity in the soil [24,25], and thus the herbicide dose must be increased. The reported research was conducted to investigate the interaction between ametryn herbicide and soil organic matter content and its effects on weed growth, herbicide persistence, and sweet corn yield.

2. Materials and Methods

2.1. Land Preparation

The field experiment took place at the Experimental Station of the Faculty of Agriculture, Padjadjaran University, Bandung, Indonesia, at an elevation of approximately 660 m above sea level with Inseptisol soil classification. This experiment was established in October 2022. In this study, the materials used included sweet corn seeds of the Paragon variety and organic matter from straw compost that had been allowed to stand for one month. Land preparation was carried out manually using a hoe to loosen the soil. As many as 54 plots each of 3×4 m^2 were established. Drainage canals were constructed between the plots. Organic fertilizer, in the form of straw compost that had been allowed to stand for approximately one month, was applied to the plots at a set dose of the respective treatments. At the trial establishment, weed coverage of the experimental plots was still low (less than 10%). The dominant weeds in the experimental area were *Cynodon dactylon*, *Ageratum conyzoides*, *Elephanthopus scaber*, and *Bidens pilosa*. Figure 1 shows a general view of the weed coverage of the treatment plots in the experimental field five weeks after application (WAA).

2.2. Application of Herbicides and Organic Materials

The investigation used a two-factor Split-Plot Design in a Randomized Complete Block Design (RCBD), replicated three times. The main plot treatments included three levels of organic matter content in the form of rice straw compost, i.e., low (no organic matter was added, B1), medium (4.2 kg/plot of organic matter was added, B2), and high (12 kg/plot of organic matter was added, B3). Based on the results of the soil laboratory analysis, the C-organic content of the plots in the experimental field was classified as low (1.97%), medium (2.50%), and high (3.50%), respectively. The subplots included six levels of ametryn doses, namely d0: no herbicide (control), d1: ametryn herbicide dose of 0.5 kg a.i./ha, d2: ametryn dose of 1.0 kg a.i./ha, d3: ametryn dose of 1.5 kg a.i./ha, d4: ametryn dose of 2.0 kg a.i./ha, and d5: ametryn dose of 2.5 kg a.i./ha. The experimental units were 3×4 m^2 plots, with a total of 54 plots, randomized based on the experimental design. The conversion of herbicide doses from hectares to experimental plots was calculated considering the plot areas (12 m^2 each), herbicide concentration in the formulation (ametryn 500 g/L), and the recommended dose (1 L/ha) of the used product. For instance, for the d1 treatment (0.5 kg a.i./ha), the a.i. required is 12/10,000 × 1 L (1000 mL) = 1.2 mL of herbicide product per plot. As there were a total of 9 (3 organic matter levels and 3 replicates) plots for each treatment, we prepared a total of 10.8 mL of product for the plots of the d1 treatment.

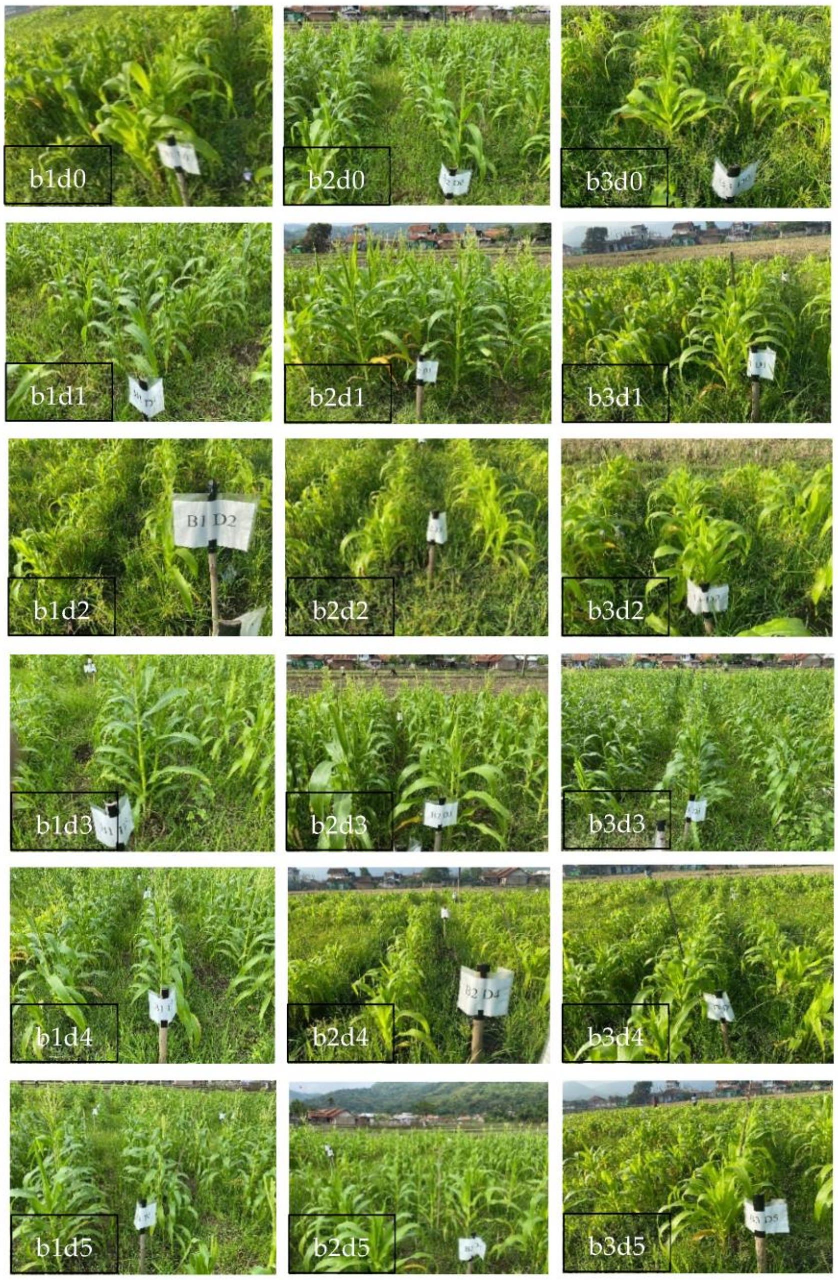


Figure 1. An overview of the weed coverage of the treatment plots five weeks after application.

Corn seeds were sown in the designated experimental plots at an interplant distance of 70 × 20 cm. Ametryn application was carried out 7 days after sweet corn planting, while the first fertilization was conducted 7 days after application (DAA) using NPK Phonska fertilizer at a dose of 150 kg/ha. At 28 DAA, the second fertilization was performed using urea at a dose of 150 kg/ha, and at 42 DAA, the last fertilization was completed using urea at a dose of 150 kg/ha. The fertilizers were applied on the right and left sides of the planting hole with a distance and depth of 7 cm.

2.3. Data Collection Procedures

Observations for weed dry weight were performed at 2, 4, and 6 WAA by cutting the above-soil parts of the weeds, drying them in an oven at 80 °C for 48 h, and weighing them using an analytical balance. The ametryn herbicide persistence was measured using the bioassay method with indicator plants, namely cucumber [26], at 30, 60, and 90 DAA. The soil sample taken from each of the treatment plots was put into a polybag, and each polybag was planted with 4-day-old cucumber seedlings, with 1 seedling per polybag. At 10 days after planting, cucumbers were harvested to measure their dry weight by baking the cucumbers in the weed laboratory for 48 h, then weighing them using an analytical balance. Microbial respiration observations in the soil, as evidence of their activity, were subjected to laboratory analysis at the Soil Fertility and Plant Nutrition Laboratory facilities located within the Faculty of Agriculture, Padjadjaran University, at 30, 60, and 90 DAA, by randomly taking 500 g of soil samples in the Experimental Station, with a depth of 20 cm from each treatment plot. Sweet corn harvesting was recommended when the plants were between 67 and 80 days after planting. Corn productivity was observed at harvesting by measuring the cob length, cob diameter, cob count, cob weight with and without the husk, and the overall weight of the yield per plot.

2.4. Data Analysis

Data obtained were processed using analysis of variance (ANOVA). The multiple comparison test, Duncan's multiple range test (DMRT), was employed once significant differences were detected at a *p*-value of 5%.

3. Results

3.1. Total Weed Dry Weight

Observations for total weed dry weight were performed at 2, 4, and 6 WAA. Weed groups included grasses, broad leaves, and sedges. The weeds growing at the establishment of the experiment included 10 species, i.e., *Cynodon dactylon* (L.) Pers., *Elephanthopus scaber* Linn., *Panicum repens* L., *Paspalum conjugatum* P.J. Bergius, *Eleusine indica* (L.) Gaertn., *Cyperus iria* L., *Ageratum conyzoides* L., *Bidens pilosa* L., *Synedrella nodiflora* (L.) Gaertn., and *Borreria alata* (Aubl.) DC. Analysis of variance showed that the interdependence between the organic matter content and ametryn herbicide treatments was apparent. During 2 to 6 WAA, the total weed dry weight increased with different magnitudes (Table 1).

Table 1. Total weed dry weight at 2, 4, and 6 weeks after application (WAA).

	2 WAA			4 WAA			6 WAA		
Treatments	**B1**	**B2**	**B3**	**B1**	**B2**	**B3**	**B1**	**B2**	**B3**
d0 (control)	2.53 b A	2.90 ab A	4.43 a A	6.93 b A	8.10 b A	13.53 a A	12.73 c A	17.36 b A	22.20 a A
d1	1.53 b AB	2.56 ab A	3.76 a A	5.53 b B	7.30 b AB	11.87 a AB	11.90 c A	15.00 b AB	20.90 a A
d2	1.20 a BC	0.96 a B	1.80 a B	5.00 b B	6.30 b B	10.36 a B	9.50 b B	13.16 b BC	18.00 a B
d3	0.73 a BC	0.66 a B	0.96 a BC	3.70 c C	4.70 b C	6.20 a C	8.10 c C	11.73 b C	13.56 a C
d4	0.46 a BC	0.56 a B	0.70 a C	3.26 b C	4.40 ab C	5.90 a C	7.70 b C	11.86 a C	11.73 a C
d5	0.23 b C	0.56 ab B	1.40 a BC	2.70 b C	4.43 a C	5.46 a C	6.53 b D	11.73 a C	11.50 a C

Note: This study used three levels of C-organic: low (B1, 1.97%), medium (B2, 2.50%), and high (B3, 3.50%). In addition, there were six different doses of ametryn application: no herbicide, 0.5 kg a.i./ha, 1.0 kg a.i./ha, 1.5 kg a.i./ha, 2.0 kg a.i./ha, and 2.5 kg a.i./ha. Mean values with the same letter(s) indicate non-significant differences according to Duncan's multiple range test at the 5% significance level at 2, 4, and 6 weeks after application (WAA). Numbers followed by uppercase letters are read vertically, indicating the interaction between one organic matter content level and various herbicide doses, while numbers followed by lowercase letters are read horizontally, indicating the interaction between one herbicide dose and various organic matter content levels.

3.2. Sweet Corn Yield per Plant

Analysis of variance showed that there was no statistical interdependence between the organic matter content and ametryn herbicide treatments for the parameters of cob length, cob diameter, and number of cobs of the sweet corn per plant. The treatment of organic matter contents did not show significant effects, while the treatment of the dose of ametryn herbicide showed significant impacts on the length and diameter of the cob. However, there was no statistically significant impact on the number of cobs (Table 2).

Table 2. Sweet corn cob length, cob diameter, and number of cobs per plant at harvest.

Treatment	Cob Length (cm)	Cob Diameter (cm)	Number of Cobs per Plant
B1: C-organic 1.97%	18.02 a	5.18 a	1.00 a
B2: C-organic 2.50%	17.97 a	5.15 a	1.00 a
B3: C-organic 3.50%	17.76 a	5.13 a	1.00 a
d0: Control	15.88 a	5.04 a	1.00 a
d1: Ametryn dose 0.5 kg a.i./ha	16.35 a	5.06 a	1.00 a
d2: Ametryn dose 1.0 kg a.i./ha	16.38 a	5.11 a	1.00 a
d3: Ametryn dose 1.5 kg a.i./ha	19.22 b	5.20 b	1.00 a
d4: Ametryn dose 2.0 kg a.i./ha	20.63 c	5.30 c	1.00 a
d5: Ametryn dose 2.5 kg a.i./ha	19.05 b	5.21 b	1.00 a

Note: Mean values denoted by the same symbol in the same column indicate no interaction at the 5% significance level based on Duncan's multiple range test. B1 is low, B2 is medium, and B3 is high organic matter content.

3.3. Weight of Cobs with and without Husk

The analysis of variance showed that there was no interdependence between the organic matter content and ametryn herbicide treatments on the parameters of cob weight with and without the husk. The treatment of organic matter content yielded no statistically significant impacts on the parameters of the cob weight, either with or without the husk, while the treatment of herbicide doses resulted in significant impacts on the cob weight, both with and without the husk (Table 3).

Table 3. Sweet corn cob weight, both with and without the husk.

Treatment	Cob Weight without Husk (g)	Cob Weight with Husk (g)
B1: C-organic 1.97%	289.41 a	264.79 a
B2: C-organic 2.50%	287.40 a	261.33 a
B3: C-organic 3.50%	285.23 a	258.94 a
d0: Control	258.24 a	238.24 a
d1: Ametryn dose 0.5 kg a.i./ha	264.10 a	242.66 a
d2: Ametryn dose 1.0 kg a.i./ha	267.01 a	246.02 a
d3: Ametryn dose 1.5 kg a.i./ha	307.03 b	275.40 b
d4: Ametryn dose 2.0 kg a.i./ha	317.91 c	286.07 c
d5: Ametryn dose 2.5 kg a.i./ha	309.78 bc	281.72 bc

Note: Mean values denoted by the same symbol in the same column indicate no interaction at the 5% significance level based on Duncan's multiple range test. B1 is low, B2 is medium, and B3 is high organic matter content.

3.4. Sweet Corn Plot Yield

Results of the experiments indicated that there was no interaction between the treatments of organic matter content and ametryn herbicide for the sweet corn plot yield. Organic matter provided no significant effects on the plot yield, while the effect of the herbicide dose on the plot yield was statistically significant. The results of the analysis for plot yield are presented in Table 4.

Table 4. Sweet corn plot yield of different treatment plots.

Treatment	Weight of Yield per Plot (kg/12 m^2)
B1: C-organic 1.97%	20.25 a
B2: C-organic 2.50%	20.11 a
B3: C-organic 3.50%	19.96 a
d0: Control	18.07 a
d1: Ametryn dose 0.5 kg a.i./ha	18.48 a
d2: Ametryn dose 1.0 kg a.i./ha	18.69 a
d3: Ametryn dose 1.5 kg a.i./ha	21.49 b
d4: Ametryn dose 2.0 kg a.i./ha	22.25 c
d5: Ametryn dose 2.5 kg a.i./ha	21.68 bc

Note: Mean values denoted by the same symbol in the same column indicate no interaction at the 5% significance level based on Duncan's multiple range test. B1 is low, B2 is medium, and B3 is high organic matter content.

3.5. Herbicide Persistence in Soil

The persistence of ametryn herbicide in the soil was assessed by observing the dry weight of the indicator plant, cucumber. Soil with high organic matter content had a high absorption of herbicides and reduced their mobility and availability [27]. The bioassay is a simple method to detect the movement of ametryn herbicide in soil. The results indicated the absence of interaction effects between organic matter content and herbicide dose treatments on cucumber dry weight at 30, 60, and 90 DAA (Figure 2). However, the parameter was affected by the organic matter content treatment. It can be seen in Figure 2 that the higher the organic matter content, the higher the cucumber dry weight. Organic matter adsorbs herbicides, so it reduces herbicide mobility in the soil and thus increases herbicide degradation [28,29]. In addition, organic matter provides food and energy to microorganisms, so a higher content of organic matter in the soil will potentially increase microbial activities, indirectly shortening the herbicide persistence. This also means that a higher dose of herbicides is required in plots with a higher content of organic matter for comparable efficacy.

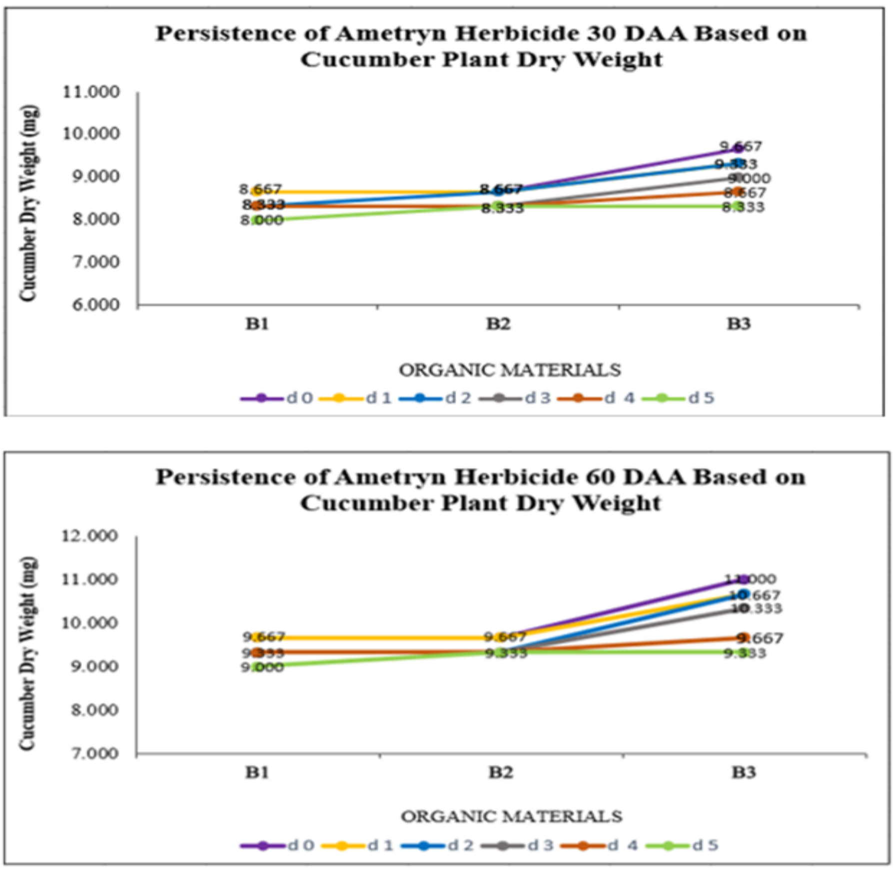


Figure 2. *Cont.*

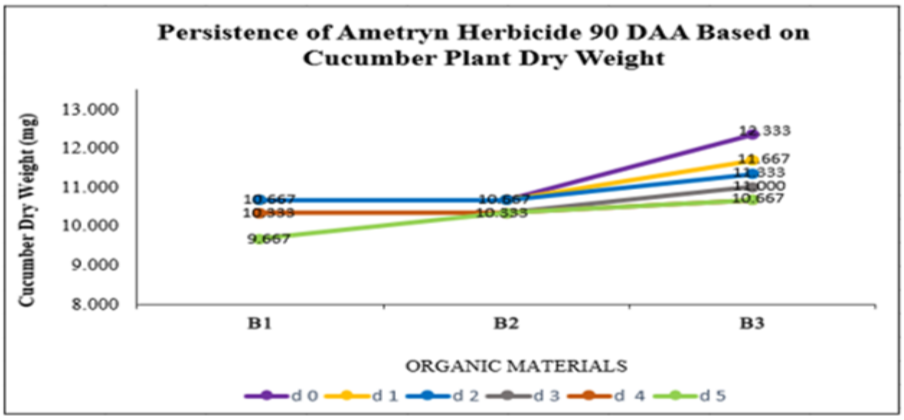
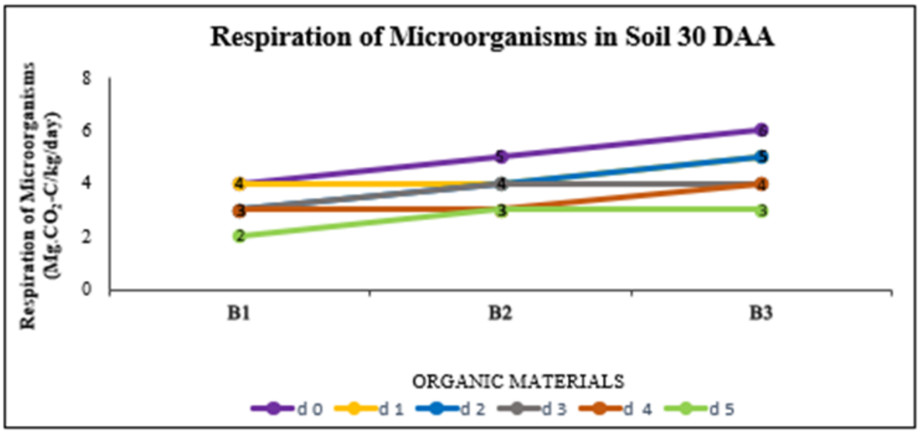


Figure 2. Herbicide persistence at 30 (**top**), 60 (**middle**), and 90 (**bottom**) days after application, as assessed through the dry weight of the indicator plant, cucumber. There was a tendency for the organic matter content to affect the herbicide persistence. B1 is low, B2 is medium, and B3 is high organic matter content.

3.6. Microorganism Activity in Soil

Organic matter provides food and energy to microorganisms, so a higher content of organic matter in the soil will potentially increase microorganism activities. The microbial respiration in general increased with higher organic matter contents (Figure 3).



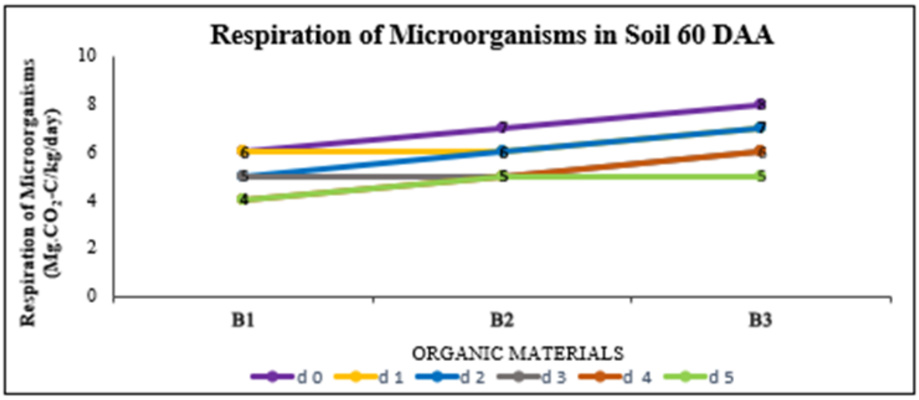


Figure 3. *Cont.*

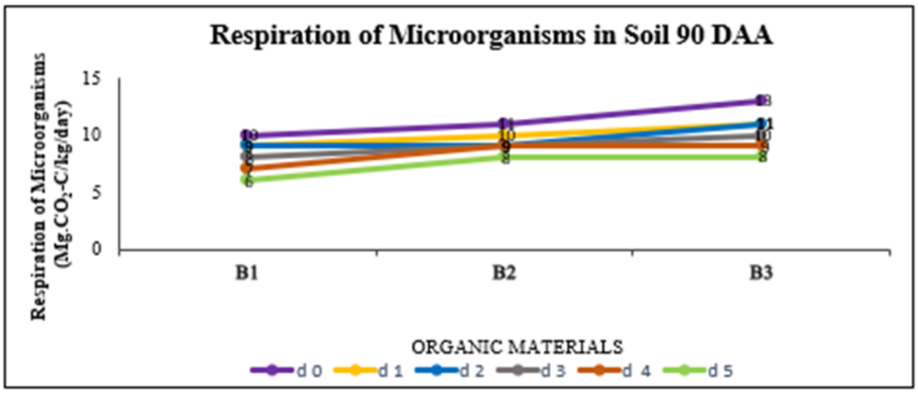


Figure 3. Respiration activity of soil microorganisms at 30 (**top**), 60 (**middle**), and 90 (**bottom**) days after application, correlating with their abundance and activities. Microbial respiration tended to increase with higher organic matter contents. B1 is low, B2 is medium, and B3 is high organic matter content.

4. Discussion

Ametryn herbicide, with dose rates starting from 1.0 kg a.i./ha, in conjunction with low, medium, and high organic matter contents, had a significantly lower total weed dry weight than that of the control treatment combined with the three levels of organic matter content (Table 1). Research by Alfredo et al. [30] also asserted that ametryn herbicide at the dose of 1.0 kg a.i./ha can inhibit proliferation of unwanted plant species up to 12 weeks after application. Furthermore, ametryn herbicide application with the dose of 2.5 kg a.i./ha, combined with a low organic matter content, yielded the lowest total weed dry weight compared to the other treatment combinations at 6 WAA. The low organic matter content limits the availability of nutrients for weed growth, resulting in a low weed dry weight. Conversely, the high organic matter treatment yields a higher weed dry weight, as the availability of nutrients is more abundant [31]. A high organic matter content can also adsorb ametryn herbicide [32] and reduce its effectiveness in controlling weeds. Therefore, treatments with high doses of ametryn herbicide combined with low organic matter tend to suppress weed growth best.

The application of ametryn herbicide, commencing from the dose of 1.5 kg a.i./ha (d3), had a significant effect on the observed cob length and diameter (Table 2). This may be explained by the fact that effective suppression of the weed growth starts from this dose, leading to reduced competition between sweet corn and weeds for growth factors and, subsequently, a lack of the growth inhibition of the length and diameter of the sweet corn cobs [33]. The growth of cobs in corn is related to the size and number of cells that require photosynthates, which are affected by nutrients absorbed by plants during cob formation [34]. In contrast, the organic matter content treatment did not have a statistically significant impact on the length and diameter of the cob. This is because sweet corn is classified as a short-lived plant and organic matter has a slow-release nature, where its nutrients are not quickly available to fulfill plant requirements [35]. However, organic matter has long-term benefits in providing the nutrients needed by plants [36]. The organic matter content and herbicide treatments did not have an impact on the number of cobs produced by the Paragon variety, i.e., one cob per plant. This seems to be the genetic characteristic of the variety. Asbur et al. [37] stated that plant growth is not only dependent on the environmental factors, such as climate and soil conditions, but is also affected by genetic factors of the plant itself.

The application of ametryn herbicide, with the dose rates starting from 1.5 kg a.i./ha (d3), had a significantly different effect than the control treatment (d0) on the cob weight, either without or with the husk (Table 3). Meanwhile, the treatment at the dose of 2.0 kg a.i./ha (d4) produced the highest cob weight compared to the other treatments, indicating the most optimal dose. An effective dose of ametryn herbicide will cause sweet corn to fail to compete with weeds, so sweet corn can use resources for photosynthesis, which is useful for sweet corn seed filling and larger cob weights [33]. Meanwhile, the organic matter treatment resulted in no statistically different effects for the cob weight, both without and with the husk. This is because organic matter with slow-release properties has not been able to immediately provide the nutrients required by the plants. According to Dwidjoseputro [38], a plant can grow well if the required nutrients are sufficiently available, and the better the corn growth, the higher the cob weight.

Results shown in Table 4 indicate significant differences in the sweet corn plot yield between plots treated with the ametryn herbicide at doses starting from 1.5 kg a.i./ha (d3) and the control plots. Maximum results were obtained from the application of ametryn herbicide at the dose of 2.0 kg a.i./ha, which proved that the efficacy of weed control can boost sweet corn production. According to research by Ningrum et al. [39], the use of ametryn herbicide at doses ranging from 1.5 to 3.0 kg a.i/ha is able to reduce weed coverage and subsequently increase crop productivity. On the other hand, the dry weight of yield per plot was not significantly affected by the organic matter content treatment. Again, this is due to the slow-release characteristics of the organic compounds [29]. The fact that the organic matter was only applied once may have also limited the availability of nutrients required to support faster growth of the sweet corn [40]. The use of chemical fertilizers helps maintain nutrient availability and their quick supply [41].

At 30 DAA, the high organic matter content treatment (b3) without herbicide (d0) produced the highest cucumber dry weight of 9.667 mg (Figure 2, top). This is attributed to the fact that the cucumber plant received enough nutrients at the b3 and d0 treatments. The low organic matter content treatment (b1) and herbicide dose of 2.5 kg a.i./ha (d5) yielded the lowest cucumber dry weight of 8.000 mg because the herbicide at the d5 dose suppressed the cucumber growth the most. It is also obvious that the high organic matter content treatment (b3) without herbicide application (d0) had the lowest ametryn herbicide persistence at 60 (Figure 2, middle) and 90 (Figure 2, bottom) DAA, with cucumber plant dry weights of 11.000 mg and 12.333 mg, respectively. This is in line with the results of the previous work, which found that the dry weight of cucumber plants is influenced by the content of organic matter and the herbicide dose [27]. High levels of organic matter content in the soil can promote the growth a cucumber plants, and at the same time, decrease the herbicide efficacy [27]. This occurs because the presence of organic matter in the soil is able to promote the degradation of herbicides by microorganisms, which lessens the persistence of the herbicides [42]. Rahman et al. [15] mentioned that a number of parameters, including soil organic matter concentration, volatilization, photodecomposition, adsorption, leaching, microbial degradation, and plant uptake, affect herbicide persistence. This explains why the lowest ametryn herbicide persistence is in line with the highest organic matter content, as indicated by the highest cucumber dry weight.

The application of a low organic matter content with an ametryn herbicide treatment dosage of 2.5 kg a.i./ha (b1d5) resulted in the lowest microorganism respiration at 30 DAA, as shown in Figure 3 (top). High microbial respiration was found in treatments with high organic matter content and no herbicide application (b3d0), which amounted to 6 Mg.CO_2-C/kg/day. At 60 DAA (Figure 3, middle), high microbial respiration was also observed in the same treatment (b3d0), amounting to 8 Mg.CO_2-C/kg/day. The lowest microbial respiration was noted in the treatment with lower organic matter content and the highest ametryn herbicide dose treatment, i.e., 2.5 kg a.i./ha (b1d5), with the value of 4 Mg.CO_2-C/kg/day. Similarly, at 90 DAA (Figure 3, bottom), the treatment with a high organic matter content without herbicide (b3d0) had the highest microorganism respiration of 13 Mg.CO_2-C/kg/day, while treatments with lower levels of organic matter content plus the highest dose of ametryn herbicide (b1d5) had the lowest respiration level, with a rate of 6 Mg.CO_2-C/kg/day. High doses of herbicides interfere with the microorganisms' metabolism via their cells, and their respiration will decrease as the herbicide dose increases [43]. In contrast, the more organic matter available in the soil, the faster the rate of soil respiration will be because organic matter can enhance the microbial activity and assist in decomposition of organic matter in the soil [44]. Therefore, the respiration rate of microorganisms is directly proportional to the amount of organic matter in the soil, and the higher the organic matter content, the higher the respiration rate.

5. Conclusions

In the current study, the effect of an interaction between the ametryn herbicide dose and the organic matter content on the total weed dry weight was obvious, but not on herbicide persistence and sweet corn yield. The most effective combinations to control weeds were the ametryn herbicide doses of 1.5 to 2.5 kg a.i./ha with either low, medium, or high organic matter content. They also increased the sweet corn yield (cob diameter, cob length, weight of cob with and without the husk, and weight of yield per plot), and thus, these doses are recommended to manage weeds of grasses, broad leaves, and sedges in the sweet corn fields.

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