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The Cirebondistrict in West Java Province, Indonesia, was the site of an invasive plant species inventory in sweet corn

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ABSTRACT

Sweet corn can be in cultivation on the highlands and lowlands. Now sweet corn planted on the rice fields after rice cultivation. The composition of the weeds on crops monocultures in a long time indicates the composition is lower than with the planting pattern rotation. The planting pattern changes also change the composition of the dominant type of weeds, from the types of weeds-leaf replaced by weeds the grass. This weed community differences were suspected because of the difference in the processing of land, distance planting, the age of the plants when observation and the condition of land used. The research was carried out on sweet corn fields in two sub-districts which represented the condition of wetlands and dry land, namely Ciledug and Pabedilan sub-districts. At each location the sample was weighed diagonally (5 times) for each plot of potato cropping using the iron squares of size 0.5 m x 0.5 m. Field data was used to summed dominance ratio and Coefficient community value. The results of this study showed that based on Ciledug with the composition of 15 broad leaves weed, seven grasses weed species and three sedges weed species. At dryland conditions this was one dominat weed species, namely *Digitaria*sp with the value of SDR 13.27%. While in wetland there were 9 broad leaves weeds species, five grasses weed specie and two sedges weed species. Weeds dominant at wetland this was *Fimbristylis sp*. with SDR value of 34,14% which is the weeds the sedges. on dry land there were 11 broad leaves of weeds, 7 grasses weed species and 1 sedges weed specie. In the wet land 5 broad leaves of weeds, 4 grasses weed species and 2 sedges weed specie. Weed dominat in e sub- district Pabedilan was *Digitariasp* weed with the value of SDR 11.64%. In wetland *Fimbristylissp* is dominant weeds with the value of the largest SDR 19.88%. With composition weed in wetland 5 broad leaves weed, 4 grasses weed species and two sedges weed species. The comparison of coefficient communities value (C) between dryland and wetland of Ciledug was of 62.16% which means that, Coefficient communities value
(C) between dryland and wetland of Pabedilan was of 48.21%. Deversity weed population in Ciledug and Pabedilan was different.

Keywords: Herbicide inventory, sweet corn, diverse ecosystems, mountain ranges, valleys

INTRODUCTION

Sudarsana (2000) notes that sweet corn is a vegetable item that many Indonesian farmers are already cultivating and sees great potential for growth in the country. Farms in Cirebon typically exclusively grow sweet corn on dry soil. However, sweet corn is now also being cultivated on rice fields. Particularly as we approach the dry season, aquaculture sweet corn is being used in rice fields. This is because sweet corn has a high water need, which is sufficient for rice field crops. When invasive plants, like weeds, are present during agricultural production, major crops and weeds will compete for available nutrients. Because of differences in growth conditions and other environmental variables, weeds in rice fields will look different from weeds on dry ground. The Cyperaceae and Graminae families, which include weeds, make up a minuscule fraction of the whole plant kingdom. The Cyperaceae, Rubiaceae, Asteraceae, and Oxalidaceae families were discovered on dry ground (Kurniadie and Umiyati, 2011).One way to find out whether weed management was effective is to introduce the kinds of weeds and the prevalent weeds in the agricultural area.

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MATERIALS AND METHODS

The research was carried out on sweet corn fields in two sub-districts which represented the condition of wetlands and dry land, namely Ciledug and Pabedilan sub-districts. The data then analyzed by destructive method namely expounds or describes the result according to circumstances found in the field. The observation is made using analysis its vegetation by a method of quadrate. Inventory weeds to know the composition of the Weeds parameter that observed is summed dominance ratio (SDR), and Coefficient community (C). Calculated by virtue of the general formula used[9].The formula for determining the Summed Dominance Ratio is:

$$\text{Relative Density Value of Species} = \frac{\text{Absolute Density Value of Species}}{\sum \text{Absolute Density Value of Classes}} \text{ x } 100\%$$

$$\text{Relative Frequency Value of Species} = \frac{\text{Absolute Frequency Value of Species}}{\sum \text{Absolute Frequency Value of Classes}} \text{ x } 100\%$$

$$\text{Relative Dominance Value of Species} = \frac{\text{Absolute Dominance Value of Species}}{\sum \text{Absolute Dominance Value of Classes}} \text{ x } 100\%$$

$$\text{Important Value} = \text{Relative Density} + \text{Relative Frequency} + \text{Relative Dominance}$$

$$\text{Summed Dominance Ratio (SDR)} = \frac{\text{Important Value}}{3}$$

Weeds species having the biggest SDR value meantsthat it wasiedominant weeds.

To compare the community of vegetation on different composition of weed in dry land and wet land used formula:

$$C = \frac{2W}{A + b} \text{ x } 100\%$$

Where :

C = Coefficient community
W = the sum of two quantities lowest to the kind of each community
a = the sum of the entire quantity on a first community
b = the sum of the entire quantity on a second community

RESULT AND DISCUSSION

Vegetation analysis of weed ; Weeds in dry land as much as 23 species of weeds that spread throughout the land of observation in the sub-district in Ciledug with the composition of 15 broad leaves weed, seven grasses weed species and three sedges weed species. At dryland conditions this was one dominat weed species, namely Digitariasp with the value of SDR 13.27%. While in wetland there were 9 broad leaves weeds species, five grasses weed specie and two sedges weed species. Weeds dominant at wetland this was *Fimbristylis sp*. with SDR value of 34.14% which is the weeds the sedges (Table 1).

Table 1 showed on dry land there were 11 broad leaves of weeds, 7 grasses weed species and 1 sedges weed specie. In the wet land 5 broad leaves of weeds, 4 grasses weed species and 2 sedges weed specie. Weed dominat in e sub-district Pabedilan was *Digitariasp* weed with the value of SDR 11.64%. In wetland *Fimbristylissp* is dominant weeds with the value of the largest SDR 19.88%. With composition weed in wetland 5 broad leaves weed, 4 grasses weed species and two sedges weed species.

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Table 1. Sum Dominance Ratio (SDR) Weeds Sub-districts in Ciledug

No	The weed	species	SDR	
			dryland	wetland
1	broad leaves	*Ageratum conyzoides*	1.12	-
		Alternanthera p	2.82	3.05
		Amaranthusdubius	2.3	1.29
		Centellaasiatica	0.59	-
		Cleome rutidospermae	3.39	-
		Commelinabenghalensis	-	1.22
		Commelinadiffusa	2.64	-
		Eclipta alba	5.09	3.73
		Euphorbia hirta	5.13	2.99
		Ipomoea batatas	1.91	1.73
		Lindernia sp.	6.95	5.49
		Mikaniamicarata	1.04	-
		Phyllanthusdebilis	6.43	4.01
		Portulacaoleraceae	4.76	4.49
		Synedrella n	1.04	-
2	grasses	*Axonopuscompressus*	10.06	5.11
		Cynodondactylon	4.49	6.62
		Digitaria sp.	13.27*	13.96
		Echinochloacolona	12.94	7.13
		Eleusineindica	1.52	3.34
		Leptochloachinensis	4.75	-
		Setariapalmifolia	1.04	-
3	sedges	*Cyperusrotundus*	4.33	1.69
		Cyperusdifformis	-	-
		Fimbristylis sp.	2.4	34.14*
		Total	100.01	99.99

Description : * = dominance weed

The composition of weeds that grow on sweet corn cultivation with dry land is different from the composition of weeds that grow in sweet corn cultivation area with wetland. This difference in weed composition can be influenced by different patterns of technical culture and land types on each observation. Dominant weeds are grown on dry land dominated by broad leave weeds and grasses wheres the dominant weeds grown in wetland are broad leave weeds, sedges and grasses (Bucher, 1998).

Digitariasp weeds are found in subdistrictsCiledug, and Pabedilan in dry and wetland fields. This species is the dominant because according to the characteristics of Digitaria are often found alongside roads, rice fields, along the river or ditch and secondary forest(Pons, 1985). Digitaria grows at an altitude of 1-1500 m above sea level which corresponds to the altitude of the place of Cirebon Regency. Weed composition that grows in Ciledug and Pabedilansubdistricts was different. This might due to different altitude, climate and cultural method(Rao, 2000). The different altitude will affect weed diversity. High altitude tendto have more weed as compare with lower altitude. Shifting weed composition occurred as a consequence of farming practices system, such as the tillage system, fertilizer application, weed control methods(Fitriana, *at. al.*, 2013). The frequency of weeding also causing weed shifting(Utami, *at. al*., 2007).

The intensity of light received by plants influences the amount of weed vegetation that lies beneath it. The more light that is transmitted to the soil surface more and more vegetation weed. The plant header greatly affects the continuous light. The area of plant canopy is strongly influenced by the age of the plant (Violic, 2000).

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Table 2 Sum Dominance Ratio (SDR) Weeds Sub-districts in Pabedilan

No	The weeds	species	SDR	
			dryland	wetland
1	broad leaf	*Alternanthera p*	7.92	-
		Amaranthusdubius	5.1	-
		Centellaasiatica	2.4	-
		Cleome rutidospermae	2.2	1.55
		Commelinabenghalensis	3.2	-
		Eclipta alba	5.09	5.29
		Euphorbia hirta	5.13	-
		Ipomoea batatas	1.91	3.69
		Lindernia sp.	6.95	2.08
		Phyllanthusdebilis	3.68	-
		Portulacaoleraceae	6.17	15.89
2	grasses	*Axonopuscompressus*	1.33	-
		Cynodondactylon	8.3	11.26
		Digitaria sp.	11.64*	18.3
		Echinochloacolona	8.03	4.61
		Eleusineindica	5.00	13.23
		Leptochloachinensis	6.38	-
3	sedges	*Cyperusrotundus*	9.68	4.22
		Fimbristylis sp.	-	19.88*
		Total	99.99	99.99

Description: * = dominance weeds

Coefficient community value weed

Coefficient community is a parameter that is used to compare the two vegetation communities from two area. The comparison is done between the same sub-districts but with different land condition so that the visible differences in the population of weeds between different land conditions. on Coefficient community Value regions of observation in the dry land and wetland can be seen in the Table 3. When the value C is greater than 75% then among both areas have common population that high enough, but when the value of the C smaller than 75 % then the area have common low population(Tjitrosoedirdjo, *at.,al.* 1984). Table 3 showed that the value of coefficient community in dry land subdistrictCiledug dry land wetland were under 75% or 62.16% which means have common low population, dry land and wetland in Pabedilan of 48.21% which means have common low population. Weed deversity in one location because was difference condition location. This might due various factor such as differences in land treatment, plant spacing, plant age during observation and land conditions used(Bucher, 1998). In some areas there is a cultivation of sweet corn by performing the maximum soil processing so that the weed seeds stored in the ground lifted up and can grow . Different soil conditions also affect weed growth, anaerobic conditions from flooding can limit germination and weed growth. Flooding resulted in weed damage through the respiratory process resistance in the root areas due to reduced oxygen in the root zone. of the difference in the processing of land, distance planting, the age of the plants when observation and the condition of land used. The difference in weed species can be caused by change in cultural method and microclimate(Mercado, 1979). If the condition of micro climate was relatively not change, so changing in weed composition will occur very slow or did not changed at all(Sastroutomo, 1990).

In some areas there that do aquaculture sweet corn with maximum land processing to do

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so with the seeds of the weeds that are stored in the land was taken up to the top and can grow. There is also the cultivation of land that is processed using a minimum land processing so seeds of weeds remain in the land. In addition the difference age sweet corn crops of different when observation also Affect the diversity comunity weeds. The age of the plants sweet corn on observation time from 2 to 6 weeks after planting (WAP), the old corn crops 6 WAP has the title the wider compared with that age 2 WAP so that the intensity of the sun received by the weeds the less cause the type of weeds that grow tend to be a little.

Table 3.Comparison of coefficient community value of weed in different Land

No.	comparisonobservation area	coefficientcomumunity (C%)
1	A dryland : A wetland (the rice field)	62.16
2	B dryland: B wetland (the rice field)	48.21

Description : A = Sub-districts in Ciledug, B = Pabedilan Sub-district,

CONCLUSION

1. The dominant weed found in SubdistricCiledug and PabedilanDigitari sp. and *Fimbristylis*sp .
2. The comparison of coefficient communities value (C) between dryland and wetland of Ciledug was of 62.16% which means that,
3. Coefficient communities value (C) between dryland and wetland of Pabedilan was of 48.21%. The weed population in Ciledug and Pabedilan was different.

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