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Effect Inundation Period to Summed Dominant Ratio (SDR) and Biomass Rice Weeds of Method SRI (System of Rice Intensification) in Indonesia

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Abstract**—** *Research by title the effect inundation period to summed dominant ratio (SDR) and biomass rice weeds of method SRI (system of rice intensification) in Indonesia. Research have been conducted in the Faculty of Agricultural Land Andalas University, Limau Manih, Padang, from February to May 2018. The study aims to identify noxious weed found in SRI method of paddy cultivation in Indonesia. Weeds that have summed Dominance Ratio (SDR) and the highest biomass in this study is a weed Cyperus rotundus, Scirpus juncoides Roxb., Fimbristylis miliacea (L.) Vahl, Cyperus pedunculatus and Richardia brasiliensis Gomez. Highest weed biomass obtained in the treatment of inundation 3 days old and weed biomass lowest is 15 days long inundation.*

Keywords**— Weeds, SDR, Biomass Weeds.**

I. INTRODUCTION

Rice is a staple food crop in Indonesia. Increasing the number of people demanding an increase in production. Increased rice production can be done by using improved varieties and applying the SRI method. Rice production could be increased if given good farming technology such as planting SRI method. SRI rice cultivation methods will produce vegetative growth components and parts better results (Lita et al., 2013). However, rice cultivation with moist soil conditions cause high weed competition with rice. Antralina (2012) stated weeds can lower rice yields to 1-2 tons SRI method. Based on observations Antralina et al., (2014) obtained seven dominant weed species in rice cultivation are capable of lowering hpertumbuhan SRI and rice yields are *Fimbristylis miliacea* (46, 13) and *Cyperus iria* (13.33), four from the class of broad-leaved namely *Ludwigia octovalvis* (14.70), *Alternanthera sessilis* (L) (13.72), *Portulaca oleracea* (17.26) and *Monochoria vaginalis* (11.31) one class of Gramineae is *Echicocloa crussgalli* (14.70) whereas in conventional cultivation there are three types, two from the class of broadleaf is *Portulaca oleracea* (49.20) and *Ludwigia octovalvis* (26.18). This is the reason the author to see what kind of noxious weed that of the SRI cultivation in the area of Padang and how the competition ability of rice varieties impera 30 with the noxious weed that.

II. MATERIALS AND METHODS

Materials used in this research is tractor, rice seeds, seed beds, fertilizer. Observations weeds after treatment is done at the age of 100 days after planting. The area of the map is used as a weed observation is 1 m^2. Observations were carried out on all plots are weed biomass, species, the area of ground cover, the amount of any weeds in the end of the study for observation and SDR and biomass of weed.

III. DISCUSSION

3.1 Dominant summed Ratio (SDR) Weeds

Table 1 shows that five types of weeds that have the highest value of the SDR is a kind of puzzle particular weed *Cyperus rotundus*, *Scirpus juncoides* Roxb., *Fimbristylis miliacea (L.) Vahl, Monochoria vaginalis and Richardia brasiliensis Gomez.* These five types of weeds belong to the noxious weed species for rice cultivation for weed SRI method has a very rapid proliferation of both vegetative and generative, lush canopy so as to cover the rice crop in the early phases of growth and issued a alelokimia compound.Another thing that can be described by the value of the SDR is the level of mastery of the weed against biotic and abiotic factors that exist in the land.

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Table.1: The Value of SDR Various Type Weeds in Rice Planting Area of SRI Method

Type of Weeds	Dominant Summed Ratio (%)				Average
	Group				
	1	2	3	4	
Cyperus rotundus	33.50	25.50	25.75	25.00	27.44
Scirpus juncoides Roxb.	9.75	17:50	14:00	10:00	12.81
Fimbristylis miliacea (L.) Vahl	13:25	14.75	11:00	9:25	12:06
Monochoria vaginalis	7:00	7.75	6:25	14.75	8.94
Cammelina difusa Burm. f.	5:50	4:50	6:25	9.75	6:50
Cyperus pedunculatus	2:50	4.75	8:50	9:25	6:25
Cyperus iria L.	6:50	7:25	7:25	2:50	5.88
Digitaria ciliaris (Retz.) Koel.	6.75	4:50	4.75	2:50	4.63
Hedyotis corymbosa	5:25	2:50	3:25	3:25	3:56
Eclipta prostrata	4:00	3:00	0:00	4.75	2.94
Brachiaria reptans	1:25	2.75	2:50	3:00	2:38
Hygrophilla auriculata	1:00	1:25	2:25	4.75	2:31
Asistasia gangetica	0:00	1:25	2.75	0:00	1:00
Echinochloa crus-galli (L.)	0:00	0:00	4:00	0:00	1:00
Limnocharis flava	3:00	0:00	0.75	0:00	0.94
ageratum conizoides	0.75	1:25	0.75	0:00	0.69
Richardia brasiliensis Gomez	0:00	1:25	0:00	1:25	0.63
Polygala paniculata	0:00	1:00	0:00	0:00	0:25

According Holom et al., (1970) *Cyperus rotundus* is one of the worst weeds in the world. This is due to weeds is not dead at the time of getting flooding, can grow well in the humid conditions of SRI land, and proliferation is very fast and a lot. According to Kris (2006) gulma puzzle has a very good competition ability. This is due to able to multiply very quickly generative and vegetative, producing alelokimia compounds that can lower the number, area and other vegetation leaf chlorophyll content as well as by Khamsan et al., (2011) alelokimia in this puzzle can inhibit the germination and growth of broadleaf weeds like Mimosa Pigra, Mimosa Invisa, Casia alata, and Porophylum ruderale.

Research has been done by Kusuma et al., (2017) show senyawa alelokimia puzzle suspected to affect the growth of weeds, the other is 2-methoxy-4-vinylphenol; phenol, 2,6-dimethoxy; and 2-furanmethanol. According to Darabi et al., (2007), 2-methoxy4-vinylphenol is a natural compound that can inhibit the germination of the grain so that the grain to avoid germination before harvest. Puzzle tuber extract the age of 3 months after planting seeds germination lowered Asistasia gangetica to 32%, with an emphasis of 54.7% compared to controls. Boreria germination extract alata in all parts of the puzzle age of 2 months after planting amounted to 21.3%, with an emphasis of 60.9% compared to controls.

weed *Scirpus juncoides* Roxb. a weed that is able to multiply even though only get a little sunlight for very efficient at using sunlight. This weed also has a height 0.75 m so as to overshadow other plants. The annual life cycle also cause a great loss for the rice crop because there will be competition during its lifetime. Weeds Fimbristylis miliacea (L.) Vahl is a weed that has a size of 0.6 m which grows upright and strong seedlings. This weed has the ability of strong competition on the roots so as to reduce the absorption of nutrients for other plants. This weed also has elelokimia compounds that can suppress the growth. Monochoria vaginalis is a wide berdau class weeds. The competitiveness of this weed with rice is being,

1. Biomass Weeds

Table 2 shows that the long inundation affect weed biomass. Lowest weed biomass was obtained at 15 days of flooding and the highest weed biomass was obtained at 3 days of flooding.

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Table.2: Biomass Old Flooding Weeds at Various Planting Rice SRI method

Inundation Period (Day)	Weed biomass (g)
3	37.47 a
6	31.25 b
9	27.34c
12	22:27 d
15	21:04 e

Figures follow the same small letters on the same column indicate no significant treatment based Test DNMRT level of 5%.

In Figure 1 we can see that the addition of long inundation able to reduce weed biomass. Extra long inundation led to a reduction of weed biomass by the equation y = -1.394x + 40.42. 40.42 constant flooding means do long for 0 days then the weed biomass is 40.42 and each additional flooding during 1 day old can lower weed biamassa at -1394.

This is due to the inundation of 3 day long there are weeds Cyperus rotundus with the highest value of the SDR. One of the factors which influence the value of the SDR is the biomass of weeds weed itself. SDR high value indicates that any weeds that also have a high weed biomass. Another thing that can be described by the value of the SDR is the level of mastery of the weed against biotic and abiotic factors that exist in the land. According Holom et al., (1970) Cyperus rotundus is one of the worst weeds in the world. This is due to weeds is not dead at the time of getting flooding, can grow well in the humid conditions of SRI land, and proliferation is very fast and a lot.

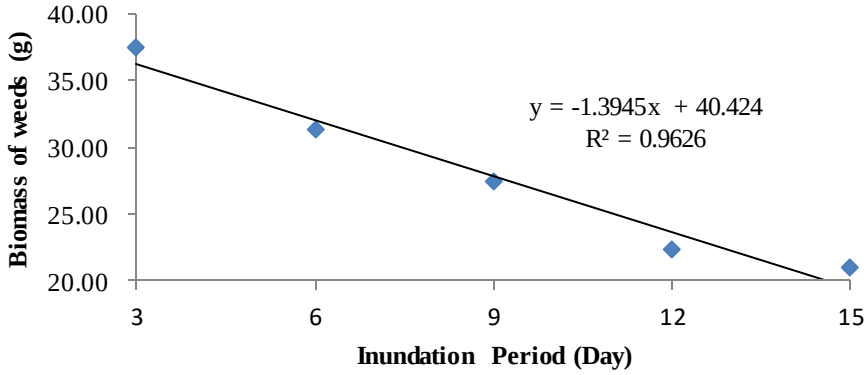

Fig.1: Decrease due of Biomass Weeds to addition Inundation Period

While flooding over 15 days caused death of weed seeds. If the number of weeds that grow up a bit and weeds that sprout growth is disturbed it will produce relatively lower biomass. This statement is supportedMujik (1970) in which the propagation material will be damaged and dead weeds if backup their food reserves reaction denaturation, coagulation proteins and the accumulation of toxic substances from the environment.

IV. CONCLUSION

Based on experiments that have been conducted found some conclusions that

1. Noxious weed in rice cultivation in Indonesia SRI method is *Cyperus rotundus*, Scirpus juncoides Roxb., Fimbristylis miliacea (L.) Vahl, Monochoria vaginalis and Richardia brasiliensis Gomez
2. Old flooding best able to control weeds in rice cultivation SRI method is long inundation 15 days.

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