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Ecophysiological Effects of Barnyardgras (*Echinochloa crus galli*) on Rice CV. Shiroudi

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Echinochloa oryzicola (Ard) Fisher) **invasive species of barnyard grass in paddy rice country and mimicking properties. The competitive effects of invasive species, barnyard grass and evaluation damage in rice fields, rice experiment station research Tonekabon city was using the figure Shiroudi in 1390. The experimental design used randomized complete block design with three replications and 10 were treated. In this study, two treatment groups was based on the number of days from sowing to transplanting. The first group includes interaction treatments in the weeds until the specified intervals after transplantation (12,24,36,48 days) was weeding weeds were present after the end of the season Plots were kept free of weeds. in the control group, treated with all-season interaction (all-season weed competition with rice), respectively. The second group includes treatments that eliminate or control the weeds until the time of transfer to each of these sets were weeding and After the end of the season, weeds were allowed to compete with the rice. Different traits studied included grain yield, plant height, flag leaf length tiller panicle length, grain filling, emptying and total seed weight, stem weight, biological yield and harvest index. Statistical analysis showed a significant decrease in rice and barnyard grass tillers, plant height, flag leaf area and yield level of 5 percent and 1 percent was possible.**

Key words: Ecophisyology, Rice, *S. hiroudi*, Weed, *Echinochloa oryzicola*.

The world's rice crop and staple food for half of the Earth is about 90 percent of its production and consumption occurs in Asia,(Khush, 2004). The annual domestic demand of rice products currently provides about 75%. (FAO, 2003) regarding the water shortage in Iran due to the possibility of increasing the acreage is very limited, it is necessary to reduce rice imports, particularly in reducing losses due to damage from weeds practical and effective measures be. Reduction of weeds in rice planting and the type of system depends on the climatic conditions and varies between 45 to 90 percent (Johnson, 1996). Although almost all farmers in their fields, weed control, however, the average global losses due to weeds in rice is estimated at about 10 percent. (Haefele, 2002). In addition, little damage, pests and diseases and weeds of rice as well as a secondary host intruder, the increased costs and reduced product quality and market are friendly (kochaki, 1380). In conventional farming systems, weed weeds are usually controlled by chemical herbicides.

Non-normative use of these materials for

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human and environmental problems and are looking for (Hong, 2004). Expand the view to sustainable agriculture, agricultural experts, the use of herbicides and the use of low-cost production techniques has directed. One of these strategies is the critical period of weed control.

Rice farming in most provinces of Gilan and Mazandaran in terms of economic, employment and the acreage. Weeds in rice production are the main Biological Barriers (Moody, 2000). If not capable of controlling 44 to 96 percent damage to the product are (Dingkuhn, 1990, Gibson, 2003, Kim, 2001, Kwon, 1991, Perera, 1992). Barnyard grass plants per square meter if no one claims to control 25 percent (Miller, 1993) and the rate of loss of control of weeds in rice is estimated to average 10% (Ampong-Nyarko, 1991).

Among the different weed, barnyard grass, due to similarities Phenological, morphological, genetic and rice as a weed of agriculture in the world this is known(Sharifi, 1380 Gealy, 2003,, Gibson, 2003, Holm, 1969, Perera, 1992, Smith, 1983). The C4 photosynthetic pathway and weeds having high efficiency in water and N uptake of rice have higher competitive ability (Alberto, 1996, Ampong-Nyarko, 1991, Brown, 1985, Patterson, 1980,) and Alone if you do not have control of 90 percent reduction in crop yield of rice in Gilan which is Agriculture transplant (Sharifi, 1380).

The loss of agricultural weeds in rice paddy of various mechanical, chemical, physical and hand weeding to control weed management and use. High efficiency, easy access, cost, ease of use(not to use hand)and the new generation's reluctance to hand weeding of paddy has been herbicides in weed management in rice plays do. Satisfaction of the herbicide efficiency, their early adoption by farmers shortly after the introduction of the north country, so that now about 99 percent of paddy rice at least one herbicide use in agriculture. Despite the relative success of herbicides to control weeds and reduce production costs, with adverse effects such as The frequency shift of weed flora (Sharifi, 1378, Bernal, 2000, ZHANG, 2003,) and the herbicide resistant weeds have been the cause (Bernal, 2000, Kim, 2000).

In addition to increasing weed resistance to herbicides and environmental problems and concerns of Use of pesticides and their adverse effects on human health, the less competitive and require more herbicide in new cultivars (Gibson, 2003).

One of the ways to provide food for a growing world population increase crop production by reducing losses that occur due to various reasons, including weeds. To achieve maximum product all factors affecting the growth of plants such as water, food, light and carbon dioxide to be available if desired. Weeds will have limited access to these factors and because they control the world, one of the key elements is the management of crop production. The quantity of weeds and reduce product quality and increase production costs (chaechi and Ehteshami, 1380).

MATERIALS AND METHODS

This project was conducted in 1390 tONEKABON rice research station., 200 meters and with a mountain 3000 meters is the rainfall annual average 1253 mm, the lowest rainfall in July and the highest in November and start downpour in the months of September and reaches its maximum. The location of sea level height of 20 - metro average annual temperature is 8 / 15 and the minimum and maximum humidity of 74% to 92%. The experimental design used randomized complete block design with three replications and 10 were treated. In this study, two treatment groups was based on the number of days from sowing to transplanting._The first group included the presence of weed interference treatments to specific time intervals after transplanting to weed all season as the control group. Weeds were allowed to interfere in the treatment of transplant transmission time intervals paced the floor in 12 and 24 and 36 and 48 days thereafter until harvest time to compete with the rice (see competition all season). In this group, after reaching each times listed weeds and weeding plots were kept weed-free until the end of the season. The second group (treatment to eliminate or control) weeds from transplanting time until transfer to any of the above dates were weeding and After the end of the season, weeds were allowed to compete with rice. Including a 5% decrease in performance after the end stages of vegetative growth at the threshold of the product, the amount of chlorophyll, plant height, tiller number, height, panicle, flag leaf area,

Table 1. Analysis of variance of the interference effect of treatments on grain yield of rice cultivars of barnyard grass control Shiroudi.

Source changes	Sum of squares (ss)	Degrees of freedom (df)	Mean Squared (m.s)	F	Significant (sig)
Repeat	3562682.13	2	1781341.07	2.86	0.0835
Treatment	20905465.22	9	2322829.47**	3.73	0.0084
Wrong	11215067.13	18	623059.29		
Total	35683214.49	29			
c.v.	2.10092				

* And ** significant at 5 and 1 percent respectively; ns: non significant mean Comparison of the effects of treatments on average grain yield showed the highest yield in the control treatment is 36 days.

number of filled grains and empty seeds , the total number of grains, grain weight, Yield, biological yield, harvest index was investigated. Transplanting 25 × 25 cm intervals to hand and was on 02/30/1390.

Each iteration consists of 10 plots that each plot in 3 dimensions 12, planting distance is 25×25.

To investigate these characteristics, prior to harvest of 12 plants randomly selected within each plot. For the measurement of chlorophyll SPAD (chlorophyll meter) was used.

40 plants for yield traits of the text and then Thrashing plot harvest, cleaning and drying, weighed, and the moisture meter, grain moisture measurement, then the weight (kg / ha) moisture standard (14%) by the following formula: were calculated $M=(\frac{1-a}{86})M'$

Where M Weight at standard humidity (14%), MÈ the weight of farm products with moisture, a moisture content that can be read with a moisture meter and grain yield kg ha-converter was used in statistical analysis.

For measurement of harvest index, four plants from each plot and in the field of soil moisture for 24 hours to put out a lot And shrubs can be used to turn the oven to prevent seed germination and stem rot is kept And then, after threshing grain in each treatment, stems and seeds separately but simultaneously in the oven for 48 hours at 75 ° gave After the oven and remove seeds and stem weight were measured and then the harvest index was calculated from the formula:

Table 2. Comparison between treatments in terms of yield.

Average	Treatment
6754.1 a	36 days of control
6340.4 ab	48 days of control
6177.2 ab	36 days of interference
6080.4ab	24 days of interference
5849.7 ab	48 days of interference
5779 ab	control period
5705.1 abc	12 days of interference
5209.1 bcd	24 days of control
4375.4 cd	12 days of control
3935.5 d	Total duration of interference
1354	LSD

Comparison based on average (2)yield between treated and control 12 days 24 days 36 days Control and different treatments was observed in controls, but there is little difference between the other treatments. The highest yield in the control treatment is 36 days.

$$100 \times \frac{\text{(Grain weight) economic performance}}{\text{(Grain and straw weight) function}} = \%\text{ (H I) Harvest index}$$

Biological function=Grain and straw weight

Statistical calculations and graphing software for SAS and EXCEL and And to compare the least significant difference (LSD) was used.

RESULTS AND DISCUSSION

All of the tests, the conclusion that a significant decrease in rice and barnyard grass tillers, plant height, flag leaf area and yield level of 5 percent and 1 percent were likely and there were

no significant differences in other traits.

Effect of treatments on tiller

Analysis of variance shows the effect of treatments on the tiller. As seen the relationship between treatment and tiller there . So that the impact of weeds on the tiller is.(sig=0.0045)

Comparison of the effects of treatments on tiller showed the highest number of tillers in the control treatments, there are 36 days and 48 days, and lowest in control treatment (total duration of interference), respectively.(LSD=4.2971)

Comparison based on average of tillers and weed control treatments 36 days, 24 days, weed control, weed control 12 days and treatment control (overlap period), there are differences. Between treatments, but control 36 days, 48 days, control, interaction of 24 days, 36 days of interaction, 12 days interaction, there is very little interference from the tiller. The highest tiller control treatment is 42 days. In fact, the lowest number of tillers in the total treatment period of weed interference has been observed.

Effect of treatments on plant height

Analysis of variance shows the effect of treatments on plant height. As seen there is a significant relationship between treatment and plant height.(sig=0.0014)

Comparison of the effects of treatments on plant height showed the highest average height in the control treatment is 36 days(.LSD=3.2976) 36 days to control plant height in treatments with control treatments (overlap period), 12 days control, control of 24 days, 36 days of interference, the interference has 48 days. However, plant height 36 days in the control treatments, control (control period), 12 days, interference, interference 24 days, 48 days is a bit different from control. Maximum height control, the treatment is 36 days.

Effect of treatments on the flag leaf area

Analysis of variance shows the effect of treatments on the flag leaf area. As seen, a significant relationship between treatment and flag leaf area, which is indicative of the effect of weeds on the flag leaf area.(sig=0.0673)

Effect of treatments on yield

Table 1. Analysis of variance shows the effect of treatments on grain yield. As can be seen in this table there is a significant relationship between treatment and seed yield.

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