it was observed that the laboratory predictions agreed well with the field conditions. The average temperatures were well within the range of 55 - 62° C on the sunny day (Table 5) The slight overshoot may be due to the variations in solar intensity of the particular day. It was also inferred that only two batches of vermicelli could be dried in a day. The time taken to dry a batch of vermicelli in a sunny day was 120 minutes in both the dryers whereas it was 315 minutes in the open yard. The drying time observed using the dryers during cloudy day was 180 minutes as against 420 minutes in open yard drying.

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(Received : April 2001 ; Revised : June 2001)

Madras Agric. J. 88 (1-3) : 12-16 January - March 2001

https://doi.org/10.29321/MAJ.10.A00291

Effect of time of sowing and weed management practices in semi dry rice

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Abstract: Field experiments were conducted at Agricultural College and Research Institute, Madurai, to study the effect of time of sowing along with weed management practices in semidry rice. The treatments included sowing practices such as pre monsoon sowing (one week ahead), pre monsoon sowing (two weeks ahead), sowing immediately after onset of monsoon, in mainplots and herbicide such as pendimethalin, pretilachlor, pretilachlor + safener, in sub plots. No significant difference was noticed among various sowing practices in the main plot. Among the herbicides, pendimethalin recorded the highest grain yield and was on par with pretilachlor + safener at 8 DAR. *(Key Words: Semidry rice, Pendimethalin, Pretilachlor, DAR) (Days After Rainfall)*

Rice is the principal crop of densely populated tropical Asia and is cultivated under varied ecosystems. In India, though rice is predominantly grown in lowland condition, 8 m ha are raised under upland condition. Semidry rice is characterized by sowing dry seed of rice with the help of monsoon rain and subsequently converted to wet condition by using tank or canal water. Under constraints of delayed release of irrigation water, semidry rice is now recommended to the rice growing farmers of Tamil Nadu.

The success of semidry rice mainly depends on time of sowing and weed management practice which accounts for 23.0 and 17.2 per cent of yield respectively (Singh et al. 1990). The effective utilization of the first monsoon rain is made possible by pre monsoon sowing for good germination and seedling establishment. The relative efficiency of pre and post monsoon sowing need to be evaluated to identify the suitable time of sowing for semidry rice.

Weeds pose severe problems in semidry rice, in the early stages of growth. The yield loss, as high as 89 per cent was reported by Sarkar and Moody (1981). This necessitates an effective weed management practice to control weeds in semidry rice. Though the conventional method of hand weeding is widely practiced, herbicides are considered to be more efficient for timely control of weeds.

Though a good deal of information is available on weed management in transplanted rice, information on optimum time of sowing and efficient weed management practices in semidry rice is not much. Keeping this in mind, a study on the optimum time of sowing coupled with weed management practice for semidry rice was conducted.

Materials and Methods

The experiment was conducted at Agricultural College and Research Institute, Tamil Nadu Agricultural University, Madurai during September 1992 to January 1993.The soil was sandy clay loam in texture and was low in available N (218.4 kg ha

and P_2O_5 (17.0 Kg ha^{-1}) and medium in available K_2O (192.0Kg ha^{-1}). The pH of the soil was 7.6 with an EC of 0.42 dSm^{-1}.

The experiment was conducted in split plot design replicated thrice. The three dates of sowing to the onset of monsoon, seven weed management practices (treatment details in Table 1) were allotted to main and subplots respectively. All herbicide applied plots were supplemented with one handweeding at 25 Days After Rainfall (DAR). The size of the gross plot was 5m x 4m and that of the net plot was 4.6m x 3.2m.

The seeds of the cultivar PMK 1(110 days) was used after hardening, by soaking in one per cent KCl for 20 hours and shade drying to initial moisture content. The hardened seeds were treated with carbendazim @ 200 g ha^{-1}. Then the seeds were treated with Azospirillum @ 1 kg ha^{-1}. The dry seeds were sown in the well prepared plots by adopting a seed rate of 100 kg ha^{-1}. The seeds were sown in furrows formed at 20 cm apart and 5cm depth and then covered with a thin layer of soil. Staggered sowing was done as per the treatment schedule. First and second sowings were taken before the onset of monsoon on 5th and 12th September 1992 and the third sowing was taken on 26th September 1992 immediately after the receipt of first monsoon rain.

Nitrogen (100 kg ha^{-1}) was applied in the form of urea in four equal splits at basal, 45 DAR, 60 DAR and at 75 DAR. Phosphorous as single super phosphate and potassium as muriate of potash were applied basally each @ 50 kg ha^{-1}. All other cultural practices were followed as recommended. The field was maintained under rainfed condition upto 45 DAR and then convered to wet land condition with canal water. The irrigation was given on one day after disappearance of 5 cm ponded water throughout the crop growth period, upto 10 days before harvest.

The biometric observations such as weed flora, weed population, weed dry weight, plant height, Leaf Area Index (LAI), panicles hill^{-1}, filled grains panicle^{-1}, test weight were recorded. After harvest, data on grain yield and straw yield were recorded.

Results and Discussion

Weed flora

In the experimental field, grassy and sedge weeds dominated over broad leaved weeds at all stages of crop growth. The major grassy weeds were *Echinochloa colonum*, and *Cynodon dactylon*, where as *Cyperus rotundus* and *Cyperus difformis* were the predominant sedges observed. The important broad leaved weeds of the experimental field were *Eclipta alba* and *Trianthema portulacastum*.

Effect on weed growth

Pre and post monsoon sowings did not show any significant influence on weed population and weed dry weight (Table 1) at all stages of crop growth.

Application of pendimethalin at 8 DAR followed by one hand weeding resulted in least weed population at 15 and 30 DAR (1.474 and 1.735 weeds M^{-2} respectively). However, it was on par with application of pretilachlor (4 DAR) + handweeding twice. The conventional method of handweeding twice was superior to all other herbicides and registered the lowest weed population (2.462 weeds m^{-2}) at harvest.

During the initial stages (15 and 30 DAR), pretilachlor (4 DAR) + handweeding (W1) and pendimethalin (8 DAR) + handweeding reduced the weed dry weight significantly compared to other weed management practices. Similar results were reported by Mishra et al (1990). The interaction effects were not significant.

Effect on Crop growth

Pre and post monsoon sowings did not influence the growth and yield components of semidry rice (Table 2) due to absence of rainfall after pre monsoon sowing and frequent rainfall after post monsoon sowings. The equal performance of pre-monsoon and post monsoon sowings might be due to the use of hardened seeds and, frequent rainfall received in post monsoon period immediately after the onset of monsoon.

All weed management practices significantly improved the growth and yield components (Table 2) as compared to unweeded check. Due to no weed competition during the critical period of crop weed competition, particularly in the early stages of crop growth resulted in taller plants with higher LAI in pendimethalin + handweeding and pretilachlor (8 DAR) + handweeding practices. This led to increase in panicles hill^{-1}, filled grains panicle^{-1} and test weight which ultimately resulted in higher grain and straw yields. Pendimethalin + handweeding recorded the highet values for the growth and yield parameters such as plant height (114.7cm), LAI (3.12), panicles hill^{-1} (6.56), filled grains panicle^{-1} (104.4) and test weight (25.2g) due to which it resulted in maximum grain (3773 kg ha^{-1}) and straw yields (5735 kg ha^{-1}). This was closely followed by pretilachlor (8 DAR) + hand weeding and were on par with each other. The beneficial effect of pendimethalin in checking weed

Table 1. Effect of time of sowing and weed management practices on weed population, weed dry weight and weed control efficiency

Treatment	Weed population (No. sq.m.$^{-1}$)						Weed dry weight (kg sq.m.$^{-1}$)						Weed control efficiency
	15 DAR		30 DAR		At harvest		15 DAR		30 DAR		At harvest		
S1 : Pre-monsoon sowing 1 WAOM	2.006	(131.6)	1.725	(78.1)	1.760	(80.5)	2.548	(446.6)	2.313	(302.5)	2.437	(347.1)	-
S2 : Pre-monsoon sowing 2 WAOM	2.001	(130.6)	1.703	(74.9)	1.744	(78.7)	2.542	(442.8)	2.313	(298.2)	2.434	(344.2)	-
S3 : Sowing immediately after monsoon	2.071	(134.2)	1.725	(79.2)	1.763	(81.6)	2.549	(449.6)	2.322	(303.5)	2.433	(345.7)	
S.Ed.	0.006		0.027		0.014		0.002		0.004		0.006		
C.D. (P=0.05)	NS		NS		NS		NS		NS		NS		
W1 : Pentimethalin 1.25 kg ha^{-1} (8 DAR)	1.735	(54.5)	1.474	(30.4)	1.632	(42.1)	2.274	(188.3)	2.086	(122.2)	2.276	(190.1)	82
W2 : Pretilachlor 1.00 kg ha^{-1} (4 DAR)	1.736	(54.6)	1.495	(31.4)	1.639	(42.1)	2.267	(185.2)	2.079	(120.3)	2.283	(191.00)	82
W3 : Pretilachlor 1.00 kg ha^{-1} (8 DAR)	1.821	(66.3)	1.571	(37.7)	1.630	(45.6)	2.369	(234.2)	2.167	(147.1)	2.326	(212.3)	80
W4 : Pretilachlor + safener (4 DAR)	1.900	(79.6)	1.672	(48.8)	1.742	(56.0)	2.455	(285.1)	2.276	(189.1)	2.426	(266.8)	75
W5 : Pretilachlor + safener (8 DAR)	1.932	(85.6)	1.718	(52.5)	1.782	(60.9)	2.500	(316.8)	2.314	(206.3)	2.456	(286.0)	74
W6 : Hand Weeding twice	2.450	(282.3)	1.634	(43.8)	1.598	(39.0)	2.962	(931.7)	2.232	(170.7)	2.229	(169.4)	84
W7 : Unweeded check	2.477	(300.6)	2.469	(296.0)	2.462	(289.9)	2.992	(982.9)	3.062	(1156.2)	3.034	(1103.6)	-
S.Ed.	0.019		0.025		0.043		0.025		0.008		0.014		
C.D. (P=0.05)	0.040		0.052		0.089		0.051		0.016		0.030		

WAOM : weeks Ahead of Onset of Monsoon
DAR : Days After Rainfall
* Figures in parenthesis indicate original values
* Rainfall received is 518.8 mm in 12 Rainy Days
* Weed control Efficiency was worked by following Sankaran and Mani (1974) method

Table 2. Effect of time of sowing and weed management practices on growth and yield of semidry rice

Treatment	Plant height at harvest(cm)	LAI at 60 DAR	Panicles hill^{-1}	Filled grains Panicle^{-1}	Test Weight(g)	Grain yield kg ha^{-1}	Straw yield kg ha^{-1}
S1 : Pre-monsoon sowing 1 WAOM	106.1	2.68	5.98	94.1	24.4	2904	4589
S2 : Pre-monsoon sowing 2 WAOM	106.9	2.70	6.02	95.6	24.8	2908	4653
S3 : Sowing immediately after monsoon	106.9	2.69	5.84	92.3	24.3	2858	4593
S.Ed.	0.975	0.085	0.010	2.31	0.09	109	120
C.D. (P=0.05)	NS	NS	NS	NS	NS	NS	NS
W1 : Pentimethalin 1.25 kg ha^{-1} (8 DAR)	114.7	3.12	6.56	104.4	25.2	3773	5735
W2 : Pretilachlor 1.00 kg ha^{-1} (4 DAR)	108.0	2.69	5.87	96.6	24.1	3016	4545
W3 : Pretilachlor 1.00 kg ha^{-1} (8 DAR)	113.6	3.11	6.37	98.2	24.8	3703	5666
W4 : Pretilachlor + safener (4 DAR)	104.8	2.68	5.67	95.8	23.1	2726	4308
W5 : Pretilachlor + safener (8 DAR)	103.8	2.67	5.37	95.1	22.4	2673	4253
W6 : Hand Weeding twice	112.4	3.11	5.94	97.2	24.2	3356	5203
W7 : Unweeded check	89.3	1.45	4.10	56.1	20.0	900	2559
S.Ed.	1.858	0.133	0.29	4.92	0.94	169	163
C.D. (P=0.05)	3.769	0.271	0.58	9.97	1.91	343	332

WAOM : Weeks Ahead of Onset of Monsoon
DAR : Days After Rainfall

growth and improving the rice yield has been reported by Tomar (1987). The higher values for growth and yield components in the promising weed management practices like pendimethalin + handweeding and pretilachlor + handweeding was due to higher WCE recorded, which in turn was due to integration of chemicals and mechanical methods of weed management. This type of integration was beneficial to control the weeds and thus resulted in better growth of rice. This falls in line with the findings of Kathiresan (1989).

The conventional method of handweeding twice also registered similar effect next to the above promising weed management practices. The beneficial effect of handweeding twice was due to the proper soil stirring given under optimum soil moisture conditon at the time of existing weed competition. Though the performance of hand weeding twice was better in controlling weeds at the later stages of crop growth, its effect on increasing yield attributes and yield was next to pendimethalin + handweeding and pretilachlor (8 DAR) + handweeding practices. This might be due to the reason that in the conventional method the weed competition was prevalent to some extent during the early stage of crop growth.

Though the performance of pretilachlor applied on 4 DAR was better in controlling weeds, this effect was not reflected in inducing the growth and yield parameters compared to pretilachlor applied on 8 DAR. The reason for the poor performance of

pretilachlor (4 DAR) on growth and yield of rice was due to its phytotoxic nature on the emerging rice seedlings. Though the phytotoxic effect vanished at the time of thinning, gap filling, the initial set back reflected on the plant growth and yield parameters. This corroborates with results of Porpavai (1990). Such phytotoxic effect was not noticed when pretilachlor was applied along with safener on 4 DAR.

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Madras Agric. J. 88 (1-3) : 16-21 January - March 2001

(Received : February 2000 ; Revised : March 2001)

Influence of fungicides and insecticides on storability of pearl millet seeds

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Abstract : Storage experiment was conducted to trace the effect of joint action of insecticides and fungicides with pearl millet cv. Co 7. The result revealed that besides exerting individual effect, Malathion 0.06 ml kg^{-1}, Decis 0.04 ml kg^{-1} and Thiram 2.5 g kg^{-1} of seed also had additive effect on storability when combining insecticide + fungicide the seeds received Decis + Thiram treatment preserved the pearl millet germination above the certification standard upto 18 months (90%) when stored in 700 gauge polyethylene bag than in gunny bag. In addition, the insecticide and fungicide combination also protected the paddy from storage fungi and insects. *(Key words : Fungicide, Joint action, Insecticide)*

Seed enter into senescence immediately after its physiological maturation. On account of the diverse biological activities taking place during storage the seed deteriorates progressively in physical, physiological and biochemical attributes finally resulting in complete death. The irreversible phenomenon of deterioration though not be prevented, can be extended by pre-storage seed management practices (Roberts, 1972). This seed management includes insecticidal and fungicidal seed treatment (Srimathi, 1997) and packing containers (Agrawal, 1996). Pearlmillet is the common cultivated crop of India. Hence an attempt was made to prolong the shelf life of the seeds through seed management practices for ambient storage at Coimbatore.

Materials and Methods

Bulk seeds of pearl millet cv. Co 7were obtained from the Central Farm of Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India. The seeds were cleaned and graded using 4/64" round perforated (1.6mm) metal sieve to homogenize the sample based on size. The seeds dried to 8 per cent moisture were imposed with the following seed treatments in three replicates. For slurry treatment 5 ml of water kg^{-1} seed was added.

T_0 - Untreated control
T_1 - Malathion @0.06 ml kg^{-1}
T_2 - Decis @ 0.04 ml kg^{-1}