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INFLUENCE OF INTERCROPPINGDHAINCHA *(Sesbaniaaculeata)* ONAGRONOMIC YIELD OF DIRECT SEEDED RICE

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Abstract

Intercropping of green manure in wet seeded rice for a brief spell of 35 to 40days and incorporating in rice crop would encash the least detrimental effect of early shading, besides ensuring addition of green manure to rice crop. The field experiments were conducted in the wetland farms of Tamil Nadu Agricultural University, Coimbatore to evaluate the effect of Dhaincha incorporation on the agronomic yield of rice. The experiment was laid out in randomized block design with ten treatments. Accumulation of biomass in Dhaincha was distinctly increased when Dhainchawas sown in rice withDrum seeder direct seeding and two rows of Dhaincha in between rice (1:2) recorded higher biomass of 18.9 t ha^{-1} followed by rice direct seeding with drum seeder + one row Dhaincha in between (1:1) recording 14.2 t ha^{-1}. Rice with green manure intercropping and incorporating in rice Direct seeding with drum seeder + two rows of Dhaincha in between (1:2) recordedhigher grain (7630 kg ha^{-1}) and straw (8900 kg ha^{-1}) yield respectively. The dynamics of Dhaincha intercropping and incorporation in direct seeded rice crop, its influence on agronomic yield, has been discussed in this paper.

Keywords: Direct seeded Rice, Biomass, Dhaincha

I. Introduction

Rice is the staple food of more than half of the world's population. The term 'Rice is Life' is most appropriate for India as this cropplaysa vital role in country's food security and is the backboneof livelihood for millions of rural households. In the present status rice in relation to remuneration, an effective resource management helps in cost reduction in its cultivation. Rice establishment by the conventional method of transplanting is costly and it is no way, better than wet seeded rice whose explicit advantage is labour saving. Further, by wet seeding, vegetative phase could be subjected to increase shading with least detrimental effect on rice yield, provided it is for the ultimate improvement in rice productivity. Intercropping of green manure in wet seeded rice for a brief spell of 35 to 40 days would encash the least detrimental effect of early shading besides ensuring green manure production, thus adding organic content to the soil.Rice productivity could be improved substantially by following cheap, cost effective newer approaches as in case of green manuring to maintain soil health. To be precise, solution lies in newer ways of organic manuring(Surekha*et al*., 2012).

II. Methodology

The field experiments were conducted in the wetland farms of Tamil Nadu Agricultural University, Coimbatoreto evaluate the effect of Dhaincha incorporation on the agronomic traits inrice crop.The experiment was laid out in randomized block design with ten treatments *viz.,*

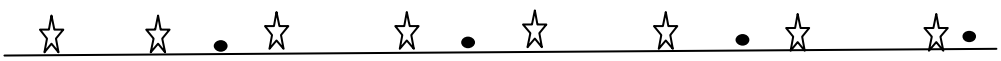
T_1 - Direct seeding with drum seeder

T_2 – Direct seeding with drum seeder + Basal incorporation *Dhaincha* @ 6.25 t/ha

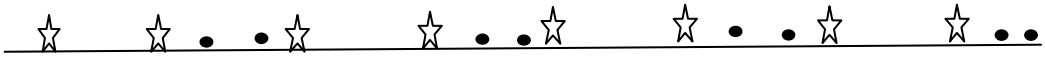
T_3 – Direct seeding with drum seeder + one row *Dhaincha* in between (1:1)

T_4 – Direct seeding with drum seeder + two rows of *Dhaincha* in between (1:2)

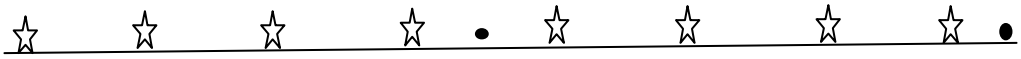
T_5 – Direct seeding with drum seeder + one row of *Dhaincha* in between two drum (2:1)



T_6 – Direct seeding with drum seeder + two row of *Dhaincha* in between two drum (2:2)



T_7 – Direct seeding with drum seeder + one row of *Dhaincha* in between four rows of rice (4:1)



T_8 – Direct seeding with drum seeder + two row of *Dhaincha* in between four rows of rice (4:2)

T_9– Direct seeding with TNAU Rice cum Green Manure Seeder

T_{10}– Direct seeding + *Dhaincha* growing in Border incorporated in main field

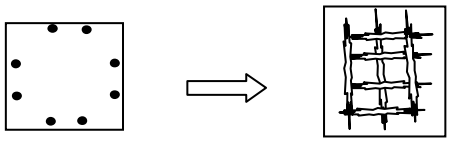


Figure 1. Treatment details of the experiment

T_1 - Direct seeding with drum seeder only, T_2 - Direct seeding with drum seeder + Basal incorporation of *Dhaincha* @ 6.25 t/ha, T_3 - Direct seeding with drum seeder + one row *Dhaincha* in between (1:1), T_4 - Direct seeding with drum seeder + two rows of *Dhaincha*in between (1:2), T_5 - Direct seeding with drum seeder + one row of *Dhaincha* in between two drum (2:1), T_6 - Direct seeding with drum seeder + two row of *Dhaincha*in between two drum (2:2), T_7 - Direct seeding with drum seeder + one row of *Dhaincha* in between four rows of rice (4:1), T_8 - Direct seeding with drum seeder + two row of *Dhaincha* in between four rows of rice (4:2), T_9 - Direct seeding with TNAU Rice cum Green Manure Seeder, T_{10} - Direct seeding + *Dhaincha* grown in border and incorporated in main field (Figure 1.). Seeds of rice variety Co 51 were used for the study. *Dhaincha* biomass production and incorporated with rice economic yield were recorded. The data recorded were statistically analysed and reported.

III. Results and Discussion

The results of analysis of variance indicated that effect of *Dhaincha*incorporation significantly affected agronomic yield in rice crop as compared to the absolute control.

Increased fresh biomass of *Dhaincha*was distinctly seen,when *Dhaincha* was sown in Direct seeding with drum seeder + two rows of *Dhaincha* in between (1:2)(T_4) its recording about18.9 t ha^{-1}*Dhaincha* biomass.It was followed by (T_3) Direct seeding with drum seeder + one row *Dhaincha* in between (1:1) recording about 14.2 t ha^{-1}. The grain (7630 kg ha^{-1}) and straw (8900 kg ha^{-1}) yield was higher with green manure incorporated with *Dhaincha*intercropping and incorporated (T_4)with treatment direct seeding with drum seeder + two rows of *Dhaincha* in between (1:2) respectively followed by (T_3) Direct seeding with drum seeder + one row *Dhaincha* in between (1:1) recordinggrain (6959kg ha^{-1}) and straw(8853 kg ha^{-1}) yield (Table 1.).

The grain yield of rice increased significantly with Direct seeding with drum seeder + two rows of *Dhaincha* in between (1:2) This might be due to the fact that steady and adequate supply of nutrients by the enhanced biochemical activity of micro-organisms coupled with large photosynthesizing surface would have helped in the production of more tillers and dry matter with enhanced supply of assimilate to sink resulting in higher yield. Similar findings are reported by (Bridgit*et al.,* 1996).This might be due to the fact that adequate biomass production and better nutrient uptake which might have resulted in higher straw yield in these treatments. This is in accordance with the results obtained by Yadav and Lourduraj (2007). The role of fertilizer N in improving the N availability which was responsible for higher DMP production inturn increased straw yield.

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Table 1.Effect of Dhaincha incorporation on Dry matter production, nitrogen content and Rice grain and straw yield

Treatments	Direct Seeded Rice(I year)				Direct Seeded Rice (II year)			
	*Dhaincha*Biomass (t ha^{-1})	*Dhaincha*Nitrogen content (%)	Rice Grain yield (kg ha^{-1})	Rice Straw yield (kg ha^{-1})	*Dhaincha*Biomass (t ha^{-1})	*Dhaincha* Nitrogen content (%)	Rice Grain yield (kg ha^{-1})	Rice Straw yield (kg ha^{-1})
T_1	-	-	4218	5578	-	-	4145	5393
T_2	-	-	5000	5798	-	-	4827	5613
T_3	14.2	2.56	6959	8853	12.4	2.48	6793	8675
T_4	18.9	2.58	7630	8900	15.4	2.50	7468	8726
T_5	7.9	2.53	6385	7958	6.8	2.45	6225	7786
T_6	11.8	2.54	6222	7705	10.2	2.46	6043	7514
T_7	6.4	2.49	5784	7021	5.8	2.42	5623	7848
T_8	10.9	2.47	6051	7437	9.8	2.40	5891	7265
T_9	5.4	2.47	5686	7046	4.9	2.40	5610	7025
T_{10}	4.8	2.45	5322	6301	4.6	2.38	5155	6122
SEd	**0.5**	**0.16**	**314**	**116**	**0.4**	**0.16**	**284**	**192**
CD (P = 0.05)	**1.0**	**NS**	**660**	**242**	**0.8**	**NS**	**596**	**400**