

EFFECT OF UNDER GROUND TILE DRAINAGE ON YIELD OF ADT 36 RICE IN WET LAND SODIC SOIL

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ABSTRACT

A study was conducted at the Soil Salinity Research Centre, Trichy during 1986 - 1988 in two seasons to find out the efficiency of sub-surface drainage on reclamation of wet land sodic soil using rice ADT 36. Two levels of lateral spacing (10 m, 15 m) and two levels of depth of drains (60 cm, 90 cm) were incorporated in the experiment in a factorial randomised block design. The water used for irrigation and the soil types were sodic in nature. The clay pipes of 50 cm length with 15 cm dia were used as drainage pipes. The plots with drain lines having lateral spacing 10 m buried at a depth 90 cm registered significantly the highest grain yield.

KEY WORDS : Sub-surface Drainage, Sodic Soil, ADT 36, Yield.

In India, about 7 m.ha of cultivated land is affected by soil salinity and sodicity and the extent of sodicity is estimated as 0.3 m.ha in Tamil Nadu.

Under wetland sodic soil conditions, leaching of sodium ions through sub surface drains play an important role in the reclamation of such soil for rice cultivation. With a view to fix the size of the lateral spacing and depth of drain, suitable for underground Tile drainage in reclamation of wet land sodic soil, a field experiment was conducted at the Soil Salinity Research Centre, Tamil Nadu Agricultural University, Trichy, during 1986 - 1988.

MATERIALS AND METHODS

To test verify the effect of under ground tile drainage in wet land sodic soil, an experiment was conducted with the ADT 36 rice at the Soil Salinity Research Centre, Tamil Nadu Agricultural University, Trichy during the year 1986 - '88.

The experiment was laid out in a factorial randomised block design with five replications. The treatments consisted of two levels of lateral spacing (10 m and 15 m) and two levels of drain depths (60 cm and 90 cm). The experimental plot consists of three blocks of 30 cents each for 10 m lateral sub surface drainage, 15 m lateral sub surface drainage and without drainage. The drain pipe of bell mouth tubes made up of clay, having 50 cm length, 15 cm dia and 2.5 cm thickness, were used for providing sub surface drainage. The drain was dug out to one m depth with 50 cm width. The length of each drain

two in one block, one in another block and the rest block having no trench.

The bottom of the drain trench was filled with sand and rammed well to a depth of 10 cm. The rammed sand surface was provided with one per cent slope longitudinally to collect the drainage water in the sump provided at the other end of the field. The bell mouth drainage pipes were laid on the sand surface of the drain trench. The joints were filled with broken tiles circumferentially to prevent the entry of soils and other debris and to facilitate the entry of drainage water alone through the joints. Coarse aggregates of 10 mm broken jelly were filled over the drain pipes to a depth of 60 cm and the remaining 15 cm with the surface soils. The surface soil was ploughed well with cultivator and recommended dose of gypsum (gypsum at 50%) was incorporated and mixed well with the soil by ploughing with a cultivator. Two leachings were given with good quality water by imbounding water over the surface soil to a depth of 10 cm for a period of 24 h. ADT 36 rice crop was raised in the experimental plots provided with and without sub-surface drainage. The crop was harvested and yields were recorded treatment wise and from the respective plot yield values, per ha yield was calculated.

RESULTS AND DISCUSSIONS

Analysis of yield of ADT 36 rice Table 1 revealed that there was significant difference in yield between treatments. The sub surface drainage (S₁D₂) with 10 m lateral spacing and with 90 cm

Table 1. Effect of underground tile drain on the yield of ADT-36 rice

(M)	Yield (kg/ha)					
	1986-87			1987-88		
	d ₁₆₀	d ₂₉₀	M	d ₁₆₀	d ₂₉₀	M
S ₁	3276	4759	4017	3766	5099	4433
S ₂	2477	2872	2674	2999	3666	3333
M	2876	3815		3383	4383	
	SE	CD (5%)		SE	CD (5%)	
L	29	88		31	94	
D	29	88		31	94	
L x D	41	124		44	134	

depth registered the highest yield of 4759 kg ha⁻¹ during the year 1986 - '87 and 5100 kg ha⁻¹ during the year 1987 - '88 respectively which differ significantly from other treatments. The highest yield may be due to the fact that, the lesser spacing with deeper depth facilitated good drainage in problem soils. This result is in conformity with the findings of Lassondiere and Martin (1974) that in under ground drainage in problem soil, the system

with 80 cm depth with 10 m lateral spacing was better performance compared to 55 cm depth with 10 m lateral spacing. Kumbhare and Rao (1985) also observed that the deep cultivation considerably reduced the soluble salts in problem soil and this would ultimately lead to higher yield. The lowest yields were recorded in the treatment having 15 m lateral spacing with 60 cm depth in both the seasons probably the water would not have drained fully intime through the shallow depth of 60 cm drain. The results revealed that the under ground tile drainage of 10 m lateral spacing with 90 cm depth of laying was found to be effective in increasing the yield of ADT 36 rice in wet land sodic soil.

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EVALUATION OF SINGLE AND THREWAY CROSS HYBRIDS OF PEARL MILLET

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ABSTRACT

Hybrids of five altered male sterile lines with 0.5 transferred genome (TG)(81A x 3383B, 81AxPb305B, 3383A x 81B, Pb 302A x Pb 305B, Pb 403A x Pb 405B) and four altered made sterile lines with 0.75 TG level (81A x 3383B², 3383A x 81B², Pb 302A x Pb 305B², Pb 403A x Pb 405B²) along with single cross hybrids of respective inbred male sterile lines and checks were evaluated during 1988-89 *kharif* and *rabi*. Significant differences were observed among the entries for all the characters in both the seasons. The three way cross (81A x Pb305B) x PIB 2231P out yielded the check X.5. The hybrids (3383A x 81B) x PIB 2231P and (Pb403A x Pb405B) x PIB 2231P recorded significantly higher yield than single crosses of their respective original A lines. The hybrids of altered A lines with 0.5 TG were found to be superior than the hybrids of respective altered A lines with 0.75 TG. Superiority of three way crosses over single crosses was observed which offered scope for the production of three way hybrids.

KEY WORDS : Single and Three Way Crosses, Altered A lines

In general, single cross hybrids because of their uniformity, have been more vulnerable than

and diseases. To obviate this type of problem, Harinarayana (1987) suggested to breed for heterogeneous and heterozygous, three way or