

## Effect of mulching and wet seed sowing on yield of winter maize (*Zea mays* L.)

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### ABSTRACT

A field experiment was conducted at the Regional Research and Technology Transfer Sub-Station, Jashipur in Orissa during *Rabi* (winter) seasons of 2006-07 to determine the effect of mulching and wet seed sowing on germination and yield of maize (*Zea mays* L.). Sowing of wet seeds resulted in maximum grain yield (3.14 t/ha) which was statistically at par with mulching of seed bed with paddy straw for eight days. Though the yield obtained by putting straw mulch of seed bed for four days was 11.9 per cent higher than the normal sown crop, it was less than mulching for eight days or wet seed sowing. Among varieties, Navjot yielded maximum grain (3.79 t/ha), which was followed by Surya.

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**Key words :** Maize, Mulching, Wet seed sowing

### INTRODUCTION

Winter season maize suffers from poor germination and scrawny plant growth due to excess cold condition. Photosynthesis and development are very low at ambient temperature of 10<sup>0</sup> C and reach their maximum rates at 30 to 33<sup>0</sup> C. Low night temperature coupled with similar day temperature causes slow rate of growth, whereas higher night temperature speeds up the development. Olsen *et al.* (1993) reported 10<sup>0</sup> C as the minimum temperature requirement for the growth of corn. The optimum temperature for development lies between 31 and 34<sup>0</sup> C. In many places, farmers face difficulty in getting good plant stand and expected yield due to severe winter. The problem is further aggravated if the temperature is too low during germination or early phase of growth. Mulching with locally available materials like paddy straw will help to maintain the soil temperature above the critical limit. Soaked seeds take less time to germinate thereby overcome the ill effects of low temperature. There is scanty information on methodology to save maize crop from hazardous effects of winter during early stage of crop growth. So, the experiment was designed to assess the efficacy of mulching and sowing of wet seed to escape from cold condition.

### MATERIALS AND METHODS

The experiment was carried out at the Regional Research and Technology Transfer Sub-Station, Jashipur (located at 21<sup>0</sup> 57'N latitude and 86<sup>0</sup> E longitude with an

elevation of 400 m above the mean sea level) in the district of Mayurbhanj in the North Central Plateau Zone of Orissa during *Rabi* seasons of 2006-07 to determine the effect of mulching on germination and yield of maize (*Zea mays* L.). The soil of the experimental site was well-drained with sandy clay loam in texture. The soil pH was 5.6. The nutrient availability was low in nitrogen (181 kg/ha) and medium in phosphorus (21.6 kg/ha) and potassium (120 kg/ha). The experiment was laid out in a split plot design with three replications. The seeds of three varieties namely Navjot, Surya and Madhuri were sown on 13 December 2006 in the main plot. Four treatments *i.e.* normal sowing, straw mulching of seed bed for four days, straw mulching of seed bed for eight days and wet seed sowing were taken in the sub plots. Uniform spacing of 60 cm x 20 cm was maintained at sowing. The crop was uniformly applied with 5 tonnes of farm yard manure and 120 kg N, 60 kg P<sub>2</sub>O<sub>5</sub> and 50 kg K<sub>2</sub>O per hectare. Total amount of P and K along with 25 per cent N were applied as basal in furrows. Fifty per cent of N was applied at knee-high stage and the rest of N was applied at early tasseling stage of the crop.

### RESULTS AND DISCUSSION

The results revealed that sowing of wet seeds resulted in maximum grain yield (3.14 t/ha), which was statistically at par with mulching of seed bed with paddy straw for 8 days. Earlier, Kar and Sahoo (2002) have also reported sowing of soaked seed during winter season found suitable to get more plant stand and higher grain

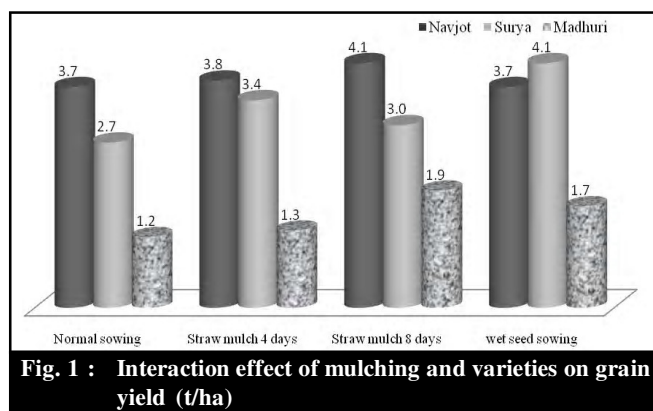
**Table 1 : Yield and its attributes as affected by variety and mulching**

Treatments	Grain yield (t/ha)	Cob yield (000/ha)	Grain (No./cob)	Grain weight (g/100 grain)	Plant stand (000/ha)	Plant height (cm)
Navjot	3.79	54.72	453.33	255.75	58.12	177.18
Surya	3.32	53.33	433.17	250.67	58.40	171.53
Madhuri	1.52	40.42	396.08	131.08	53.06	161.56
C.D. (P=0.05)	0.21	4.37	NS	2.06	NS	NS
Normal sowing	2.53	51.20	405.44	209.22	58.80	163.84
Straw mulch for 4 days	2.83	48.61	420.00	210.56	56.02	169.53
Straw mulch for 8 days	3.01	45.93	452.78	212.44	56.00	176.50
Wet seed sowing	3.14	52.22	431.89	217.78	61.30	170.49
C.D. (P=0.05)	0.28	NS	32.22	2.84	4.69	7.71

NS=Non-significant

yield of maize. Though the yield obtained by putting straw mulch of seed bed for four days was 11.9 per cent higher than the normal sown crop, it was less than mulching for eight days or wet seed sowing (Table 1). The increase in yield was due to more number of cobs and more number of heavier grains per cob. The grain weight was maximum (217.78 g /100 seed) with wet seed sown crop followed by crop mulched for eight days. The germination and plant establishment was comparatively better in wet seed sowing as evident from maximum number of plants (61.30 thousand/ha). The plant stand obtained from mulching of seed bed was at par with the normal sown crops. Taller plants were resulted from the straw mulched crop due to shedding effect at early stage of growth caused by mulching. The shelling percentage was not much affected by the treatments of mulching of seed bed or wet seed sowing.

Among the varieties, Navjot yielded maximum grain (3.79 t/ha) followed by Surya and Madhuri. The grain yield of Madhuri is much less (1.52 t/ha) due to less number (396 no./cob) of lighter grains ( 131.08 g/100 grain) in the cob. The cob yield was also highest (54.72 thousand/ha) with Navjot as compared to other varieties. Final plant stand and number of grains per cob was statistically unaffected by the varietal difference. The interaction effect shows that variety Navjot with straw mulching for 8 days and variety Surya with wet seed sowing resulted maximum (4.1 t/ha) grain yield, which was at par with variety Navjot mulched for 4 days or normal sowing (Fig.1). Irrespective of the method of sowing, the grain yield was minimum (1.2 to 1.9 t/ha) with the variety Madhuri.



**Fig. 1 : Interaction effect of mulching and varieties on grain yield (t/ha)**

From the results of this experiment, it is suggested to sow wet seeds of maize or adopt mulching of seed bed with paddy straw for eight days to get rid of the ill effects of low temperature during winter season.

## REFERENCES

- Kar, A.K. and Sahoo, S.C. (2002).** Effect of soaking the seed in water and treating with fungicides on the plant stand and yield of maize (*Zea mays*). *J. Indian Agric. & Weed Sci.*, **2**(1) : 37-38.
- Olsen, J.K., McMahon, C.R. and Hammer, G.L. (1993).** Prediction of sweet corn phenology in subtropical environments. *Agron. J.*, **85** (2) : 410-415.

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