

## Performance of Mustard Genotypes Growing in Saline Water Irrigation Condition in Semi Arid Climate

S.K. Chauhan

Management of Salt Affected Soils and Use of Saline Water in Agriculture  
R.B.S. College, Bichpuri, Agra-283105 (U.P.)  
email: coolyash40@yahoo.com

### Abstract

A field experiment was conducted in AICRP- Management of salt Affected Soils and Use of Saline Water in Agriculture Project (ICAR), at Raja Balwant Singh College of Agriculture, Bichpuri, Agra (U.P) during rabi 2012-13. Fourteen mustard genotypes were tested in ECiw 12 dS/m water irrigation. Genotype CS-2800-1-3-1-1 produced significantly higher yield (12.80 q/ha) and minimum in CS 13000-3-1-1-2-1(10.05 q/ha). The other genotypes produced grain yield in between 11.41 to 10.05 q/ha.

### Introduction

Due to sharply increasing population the scarcity of edible oils has become the major problem. Indian mustard (*Brassica juncea* L.) is an important oil seed crop of arid and semi-arid parts of India. In the Indo-Gangetic plains of Northern India, this crop is grown on about 3.8 million hectare, mainly as a dry land crop. Because of water shortages at critical growth stages, substantial field loss occurs. The crop may be unable to complete its life cycle because of failure of winter rains.

### Material and Methods

The experiment was conducted at the experimental farm of AICRP-Management of Salt Affected Soils and Use of Saline Water in Agriculture, Raja Bal want Singh College of Agriculture, Bichpuri , Agra during 2012-13 in micro-plots. The soil profile (0-90 cm) had an initial pH 8.5, ECe 1.9 dS/m, CEC 8.6-14.7 me/100 g, CaCO<sub>3</sub> < 1%, organic carbon < 0.5%. The land of experimental site is well drained and fairly permeable and water table always remained below 13.8 m during the study period. The field plots of 2.5 m x 2.5 m size were lined

with polythene sheets up to the depth of 90 cm. The average rainfall in the area is 650 mm with more than 75% occurring during rainy season. The mustard genotypes received from Directorate of Rape seed mustard Research, Sewar, Bharatpur, Rajasthan. The twelve genotypes were tested in 12 Eciw level salinity water. The experiment was conducted in randomized block design with three replications. The saline waters were prepared synthetically by dissolving desired amount of NaCl, Na<sub>2</sub>SO<sub>4</sub>, CaCl<sub>2</sub> and MgSO<sub>4</sub> salts and SARiw was kept 10 (mmol/l)<sup>1/2</sup>. The all agronomic practices were applied. For determination of soil Ece, the soil samples were collected at sowing and at harvest time from 0-15 to 60-90 cm depth.

### Results and Discussion

The yield and yield attributing characters are presented in Table 1. It is indicated that germination percent, Days of 50% flowering and primary branches per did not differ significantly. The plant height per plant, secondary branches per plant, No. of siliqua per plant, seed yield per plot and seed yield per

hectare differ significantly. The significantly higher yield was produced by genotype CS-2800-1-3-1-1, CS 9000-1-2-2-1-2 and CS 2009-105 (12.80,12.69 and 12.64 q/ha) and minimum

by CS 13000-3-1-1-2-1 (10.05 q/ha). The other genotypes produces grain yield in between 11.41 to 10.05 q/ha. The same results were observed by the past investigators<sup>[1,2,3]</sup>.

**Table 1 Yield and yield attributing characters of mustard as affected by saline water irrigation**

Genotypes	Germination (%)	Days of 50% Flowering	Plant Height (cm)	No. of Primary Branches	No. of Secondary Branches	No. of Siliqua per Plant	Grain Yield (q/ha)
CS 8000-1-2-8	73.8	62.0	169.9	5.3	5.5	258.8	11.41
CS 1100-1-2-1-4	72.5	60.6	154.9	5.4	8.7	278.0	10.45
CS 2200-3-4	72.5	65.3	154.3	6.4	7.9	259.6	10.34
CS 2009-105	64.2	67.7	167.3	5.4	6.4	269.4	12.64
CS 2100-3-6	65.7	65.7	159.9	6.2	8.9	288.5	10.96
CS 9000-1-2-2-1-2	75.8	64.7	185.4	6.5	9.9	272.3	12.69
CS 13000-3-1-1-4-2	66.3	67.0	167.4	4.4	5.6	235.0	10.51
CS 2800-1-3-1-1	74.5	60.7	179.2	6.2	7.9	279.8	12.80
CS 13000-3-1-1-2-1	74.6	64.0	174.5	4.9	6.5	272.1	10.05
CS 15000-1-2-2-2-1	68.5	62.0	164.8	5.2	4.5	228.8	12.16
CS -54(Check)	73.3	63.3	163.1	5.0	5.3	263.5	11.25
Kranti (Check)	75.3	62.7	174.0	5.8	6.7	262.2	10.98
CD at 5%	NS	NS	14.2	NS	3.2	50.1	1.5

**Table 2 Soil analysis at sowing and at harvest of mustard genotype (dS/m)**

Water salinity	Soil depth (cm)	At sowing	At harvest
ECiw-12 dS/m	0-15	7.1	10.8.4
	15-30	5.5	8.1
	30-60	4.3	7.1
	60.90	3.5	6.2

The soil salinity build up at sowing and at harvest is presented in (Table 2). The salinity was higher in upper layers at sowing time. The

salinity decreased in lower depth at sowing and at harvest time.

**Reference**

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3. Tripathi, A.K and Tripathi, H.N. (2003). Influence of N levels on growth and quality of Indian mustard (*Brassica juncea*) cultivar. Farm Sci. J. (12): 171-172.