

Influence of sowing dates and application of zinc on the performance of mustard in South-West semi arid zone of Uttar Pradesh

M. F. Husain* and Ravinder Kumar

C.S. Azad University of Agriculture and Technology, Regional Research Station, Madhurikund, MATHURA (U.P.) INDIA

ABSTRACT

A field experiment was carried out on typic ustochrepts at Madhurikund Farm, Mathura on mustard (var. VARUNA) in RBD with three dates of sowing (September 25, October 10 and October 25) in combination with three levels of Zinc (0, 15 and 30 kg/ha). The experiment was replicated thrice. All growth parameters yield attributes along with biological, stover and seed yields were found significantly higher under September 25 sowing compared with October 10 and October 25. Application of zinc though significantly increased the plant height, number of green leaves, branches and siliquae per plant but failed to show any significant effect on crop maturity and yield attributes like siliquae length, seeds per siliquae and seed yield. However, zinc application recorded higher thousand seed weight and straw yield. Delayed sowing of mustard after September 25 reduced production of oil, oilcake and fuel by 1.4 and 13 kg / day / hectare respectively up to October 10 and reduced drastically beyond 10 October at the rate of 8.13 and 42 kg / hectare / day oil, oilcake and fuel respectively. Protein content in seed was remained unaffected due to different dates of sowing. However, seed protein content and total sulphur uptakes were significantly increased with the application of zinc. Application of zinc did not influence the seed oil content. September 25 showing recorded maximum (Rs. 12259) and October 25 the least (Rs. 5377) net profit / hectare.

Key words: Mustard, Siliquae, Yield, and Growth parameters, Uptake, zinc.

INTRODUCTION

Establishment of Technology Mission of oilseeds during 1986 though help in boosting oilseeds production of the country during recent years, but it is still remain much lesser to full- fill the needs of growing population of the country. Uttar Pradesh, especially south-west semi arid zone of the state is the major area of rape seed-mustard cultivation in the country. State produces 1.6 million tones of mustard with an average productivity of 10.25 q/ha only,

Which is much lower than the potential, probably due to the cultivation of crop on marginal and sub marginal lands with poor soil fertility. There is an urgent need in increasing production of mustard crop through integrated nutrient management and optimizing sowing time to suit abnormal climate change particularly shorter winter spell with appreciable rise in temperature during the month of February observed during late nineties. Therefore, an experiment was conducted to study the effect of earlier or later sowings and application of zinc on growth, production and quality of mustard with an aim to maximize production and improve quality of produce in south- west semi arid zone of the state.

MATERIALS AND METHODS

The field experiment was conducted with mustard var. *varuna* during three consecutive winter rabi seasons (1999-2000 to 2001-2002) at Madhurikund farm, Mathura. The Experimental soil (Typic ustochrepts) was sandy lome in texture, having pH 7.0, E.C 0.96 dsm⁻¹, organic carbon 0.14%, available N 245kg/ha, available P₂O₅ 16kg/ha, available Sulphur 7.7ppm, available zinc 0.35ppm and field capacity 18.88%. Nine treatment combinations consisted of three sowing dates (September 25, October 10 and 25) and three levels of .Zn (0, 15 and 30 kg. / hectare.) applied through zinc oxide in three replicates in RBD having plot size of 5m x 4m. A uniform dose of 80 kg N, 40kg.P₂O₅ 40 kg S and 30 kg. K₂O / hectare was applied through Urea, Di-ammonium phosphate, gypsum and Murate of Potash, respectively to all treatments. All the fertilizers were applied at sowing time except N, which was applied in two splits; half as basal and remaining half was top-dressed after first irrigation (30 DAS). Mustard seeds were sown at the rate of 5 kg. / hectare at spacing of 45cm.x20cm. under optimum moisture condition. The uniform crop stand in each plot was ensured by thinning at 25 DAS. The crop was irrigated as when required. The agronomics practices were carried out to keep the crop free from weeds, pests and diseases. Plant growth parameters of mustard crop were recorded at regular inter-

vals. Initial soil samples, seed and straw samples were duly processed and analyzed following standard procedures. The data presented were analyzed statistically on pooled basis for three years following standard method.

RESULTS AND DISCUSSION

Plant Growth Parameters

Earliest sown crop on September 25 produced significantly taller plants than later sowings at all stages (Table-1). The number of green leaves / plant also showed significant variation due to different sowing dates at all the stages of growth which reduced subsequently with each later date of sowing. Number of green leaves / plant seem to be associated with more plant height and higher number of branches / plant, which also behaved in the same manner. More leaf area and leaf area index with earlier sowing of mustard have also been reported by Lad et al (1993). The number of different types of branches / plant and total branches / plant were also significantly higher in early sowing on September 25 and reduced thereafter. The later sowing on October 25 almost failed to produce tertiary branches. The September 25 sowing formed 2.39 and 6.60 more number of branches / plant than October 10 and 25 sowings, respectively. Higher branches in early sown crop might be due to optimum weather conditions availed by the experimental crop in early sowing during branching phase of the crop. Similar results have also been reported by Rajput et al (1991), Yadav et al (1994) and Sarma et al (1997). Zinc application significantly influenced plant height that increased with the increase in Zinc doses. Increase in plant height due to 30kgZn/ha was measured 13.28 and 4.66cm higher than control and 15kg.Zn/ha respectively at harvest (Table-1). Similar results have also been reported by Mahotra et al. (1977) and Samui et al. (1981). On mean basis, 15 and 30 kgZn/ ha enhanced number of green leaves by 0.82 and 1.52 per plant at 60 days stage and 0.47 and 0.90 at 90 days stage, respectively over control. Such increases in number of leaves seem to be associated with number of branches per plant, which also increased with increasing Zinc doses. Influence of zinc did not observed in case of the number of tertiary branches. Flowering and maturity periods also were not influenced significantly by Zinc application.

Yield attributes:

All siliquae characters viz number of siliquae / plant, siliquae length and number of seed / siliquae maximized under early sowing

*Author for correspondence