

ABSTRACT

Despite agricultural development, mono-cropping with rainfed rice is still in vogue in large areas in India, and particularly in the Eastern Region. In order to study the feasibility of introduction of a second crop after the harvest of wet season rice in November or early December, an investigation was planned in the agro-climatic condition of south-eastern region of West Bengal.

In this investigation, it was planned to find out the growth potential of winter crops like wheat, gram, lentil, mustard and safflower which were grown adopting suitable agronomic practices viz. tillage, date of sowing, depth of sowing and seed soaking, out of six experiments, two were conducted in field, three in lysimeters and one in pots.

It is apparent from the experiments that the crops can be grown successfully on the conserved moisture, although there was considerable variation in their performance which was mostly influenced by the availability of soil moisture. The deeper rooting depth helped mustard to use greater amount of profile moisture and to maintain highest relative leaf water content; even then it could not supersede gram in Water-use-efficiency, harvest index and energy index.

Among the tillage practices, strip-ploughing and zero tillage were more beneficial than conventional tillage. Such beneficial effect of strip-ploughing was mainly due to better

soil moisture conservation which was more desirable during 1982-'83 as compared to 1981-'82. Greater availability of soil moisture due to either strip-ploughing or zero tillage proved to be most advantageous to gram followed by mustard, lentil and wheat. Safflower remained comparable to mustard. However, there was considerable increase in seedling emergence, rooting depth, yield components, harvest index, energy index, relative leaf water content and water-use-efficiency of all the crops when they were sown under strip-ploughing or zero tillage.

Among the different dates of sowing, crops sown on 30th November or on 9th December performed better than those sown on 18th December or later. During 1981-'82 due to higher availability of soil moisture the adverse effect of late sowing even upto 18th December was not observed.

The seedling emergence and crop establishment were improved by sowing the seeds at 4 cm depth and/or by soaking the seeds for 4 to 6 hours before sowing. In other words, by proper depth of sowing and seed soaking prior to sowing, a desired crop stand could be obtained which ultimately improved the performance of all the crops in terms of yield and harvest index. However, in mustard even sowing at 2 cm was comparable to 4 cm depth.

The estimates of harvest index, energy index and benefit-cost ratio clearly indicated that under the agro-climatic condition of eastern region of the country,

cultivation of gram, mustard and lentil is not only feasible
but also economically viable.