ABSTRACT

INFLUENCE OF SOWING DATES ON PHYSIOLOGICAL DEVELOPMENT, YIELD AND SEED QUALITY OF SOYBEANS

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The objectives of this investigation were to study the influence of sowing dates on the physiological development, yield and seed qualities of 6 soybeans varieties. The two sowing dates were (i) started from 24 December 1998 to 24 April 1999, and (ii) from 8 January 1999 to 8 May 1999.

The results from the two sowing date treatments indicated that average grain yield of 6 soybean varieties in the first sowing date was slightly higher than that in the second sowing, but the difference was not statistically significant (177.9 kg/rai compared to 164.2 kg/rai). There was no interaction between sowing date and variety. However, grain yields were significantly different among the 6 varieties with Chiang Mai 60 producing the highest average yield of 235 kg/rai. Lowest grain yields were from the lines of SSRSN 35-19-4 and SSRSN 35-20-27 (98.03 and 98.90 kg/rai, respectively) which were statistically different from the other lines.

Similar to grain yield, seed yield was not significantly different between sowing dates and there was no interaction between sowing date and varieties. Grain yields

were significantly different among varieties, with the line SSR 8407Y-2-1 producing the highest yield of 169.2 kg/rai and was statistically different from the other lines (average between 119.0-134.6 kg/rai), except the line SSRSN 35-19-4 (83.4 kg/rai).

The analysis of physiological development such as LAI, CGR and HI indicated that there was no significant difference between sowing dates and there was no interaction between date of sowing and variety. However, there were significant difference among varieties.

Seed quality was evaluated using three methods of standard test, accelerated aging test (AA test) and field emergence test. Seeds of the 6 varieties collected from the two sowing dates were kept under natural conditions for 40, 70, 100 and 130 days after harvesting. Germination tests were then carried out using the three mentioned methods. With the standard test, it was found that there was no significant difference between sowing dates and there was no interaction between date of sowing and variety. However, the germination percentage of seeds in all varieties was clearly reduced with prolonged aging (reduced from 91.47 % to 77.41 % from 40 days to 70 days and reduced from 77.41 % to 68.40 % and 50.42 from 70 days to 100 and 130 days respectively). There was statistical difference among varieties only for seed keeping at 100 days with the line SSRSN 35-20-27 having lowest germination percentage of 64.01 % followed by the line SSRSN 35-19-4 (66.68 %). Other lines were not significantly different with average germination percentage of 69.87 %

With AA test , There was no difference between sowing dates and also no interaction between date of sowing and variety. Using the average from the two sowings, germination percentage of soybean seeds was reduced from 73.27 % at 40 days to 15.16 % at 130 days.

Similar results were recorded in the field emergence test with the average reduction of germination percentage from 88.37 % at 40 days to 47.12 % at 130 days.

Record for percentage of good and green seeds in the 6 varieties suggested that the line SSRSN 8407Y-2-1 had highest good seed percentage (91.50 %) whereas Chiang Mai 60 had lowest good seed percentage of 84 %. In contrast, Chiang Mai 60 had highest percent of green seed of 16.00 % whereas the line SSR 8407Y-2-1 had lowest percent of green seed of 8.50 %. Other lines had the green seed percentage of between 10.50 % - 12.00 %. Purple and rough seeds were not found in all varieties.

From correlation analysis, it was found that grain yield was positively correlated with number of pods per plant (r = 0.91) but was negatively correlated with 100 seed weight (r = -0.94)