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SCREENING OF POTATO GENOTYPES FOR SALINITY TOLERANCE

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Abstract

Thirty-four potato genotypes were evaluated in the farmers field at Shahos, (Dumuria), Khulna during rabi season of 2002 - 2003. Salinity ranged from 3.31 to 6.14 mmhos/cm from November to March at the experimental field. Most of the genotypes performed well. The tuber yield ranged from 8.89 t/ha (line 94 - 420) to 19.17 t/ha (Sirinda) with an average of 15.43 t/ha. Tuber yield was more than 15.00 t/ha in 23 genotypes and more than 18.00 t/ha for 8 genotypes. The high-yielding genotypes were the lines, 86 - 140 (18.33 t/ha) and 88 - 163 (18.06 t/ha) and the varieties, Heera (18.61 t/ha), Chamok (18.33 t/ha), Multa (18.06 t/ha), Colombus (18.06 t/ha), Sirinda (19.17 t/ha) and TPS-1 (18.61t/ha). The high yield was mainly contributed by the high number of tuber per hill.

Potato is an important non cereal food crop in the world. It ranks third after rice and wheat in Bangladesh. It grows in rabi season. Potato covers 0.243 millions hectares with an annual production of 2.933 million tons (BBS 2000). The southern belt of Bangladesh is affected by salinity in about 0.83 millions hectares (BARC 1993). Most of the saline areas remain fallow during rabi season. By the expansion of potato cultivation in these areas, part of the food crisis may be mitigated. So, suitable varieties of potato are essential for these regions. Hence, the present screening programme was undertaken to identify the salt tolerant varieties of potato.

Thirty four potato genotypes were evaluated in the farmers field at Shahos, (Dumuria), Khulna during rabi season of 2002 - 2003. The unit plot size was 3.0 m × 1.2 m per genotype with plant spacing of 60 cm × 25 cm (Non-replicated). Planting was done on 12 December, 2002. Fertilizers were applied @ 160-105-150 kg/ha of N-P_2O_5-K_2O, respectively as per recommendation of Tuber Crop Research Centre (TCRC 2003). Full dose of P_2O_5, ½ N and ½ K_2O were applied as basal. The remaining N and K_2O were incorporated at 35 days after planting. Plant protection and other intercultural operations were done as and when necessary. Soil samples were collected from ten different places of experimental field at every 15 days interval for determination of soil salinity. These ten samples were mixed together and divided into three sub-samples. Salinity was measured by EC meter from each sub sample and mean value was calculated. Salinity range was found from 3.31 to 6.14 m mhos/cm from November to March at the experimental field. Number of tuber/hill was determined from 5 randomly selected hill (per variety) and tuber yield was calculated on the basis of whole plot. The experiment was harvested on 21 March, 2003.

Per cent of emergence was very good in most of the genotypes. Twent-three genotypes gave 100% emergence and only 11 genotypes gave the emergence per cent below 100. Genotypes, 86-844 and 87 - 607 gave the poorest per cent of emergence (88 and 84, respectively) and other nine genotypes gave emergence of 92 - 96%. Production of number of tuber/hill ranged from 3.75 to 8.71. Thirteen genotypes produced tuber/hill above 7.00. For most of these13 genotypes, higher number of tuber/hill contributed to produce higher tuber yield and vice versa. Therefore, number of tuber/hill is only the yield contributing character.

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Most of the genotypes performed well in respect of tuber yield. The tuber yield ranged from 8.89 t/ha (line 94-420) to 19.17 t/ha (Sirinda) with an average of 15.43 t/ha. Tuber yield was more than 15.00 t/ha in 23 genotypes and more than 18.00 t/ha for 8 genotypes. The high yielding genotypes were the lines, 86-140 (18.33 t/ha) and 88-163 (18.06 t/ha) and the genotypes Heera (18.61 t/ha),Chamok (18.33 t/ha), Multa (18.06), Colombus (18.06 t/ha), Sirinda (19.17 t/ha) and TPS-1 (18.61 t/ha). The high yield was mainly contributed by the higher number of tuber per hill. The results are in agreement with the report of RARS (2001). The results revealed that potato might be commercially cultivated in the coastal area with tolerant genotypes.

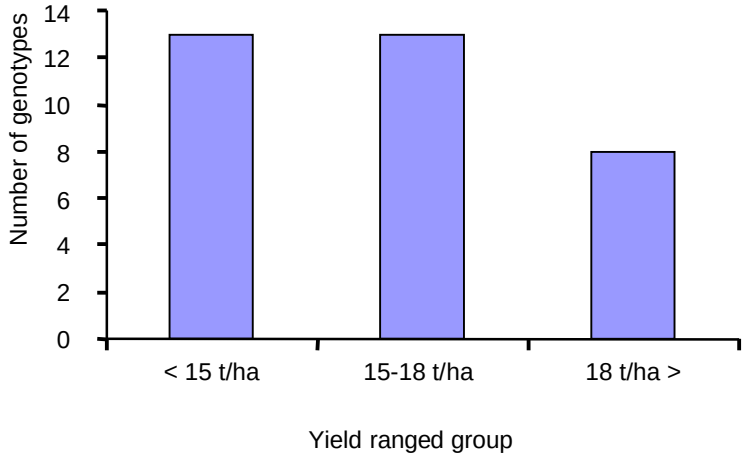

Fig. 1. Showing the yield ranges of potato with number of genotypes.

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