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Flue-Cured Tobacco Germplasm Evaluation

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During the past eight years, 99 exotic varieties of flue-cured tobacco germplasm obtained from 11 countries were evaluated for their yield and quality at CTRI Black Soil Farm, Katheru (Andhra Pradesh) in three separate sets consisting 53, 27 and 19 exotics during 1979-81, 1982-85, 1983-86, respectively. In all the sets, differences due to varieties were significant. The interaction, varieties × seasons, was significant for green, bright and TBLE yields in the first set, cured and bright leaf yields in second set, and cured and TBLE yields in the third set. The varieties MRS-2, Rila-9, F-207 and McNair-14 in the first set, Coker 316, Coker 86, NC 98 in the second set and V-156, B. Grain Reditto in the third set were found promising. The data on morphological, chemical and physical characteristics for all the varieties are also presented.

The Central Tobacco Research Institute, Rajahmundry has assembled well over 1,600 germplasm collection in several *Nicotiana* species, including 400 flue-cured Virginia types. The germplasm collections were screened and evaluated systematically for their yield, chemical and physical characteristics as well as for resistance to prevelent diseases and pests. During the period 1984-1987, 99 varieties of flue-cured tobacco introduced through NBPGR from Australia, Bulgaria, Canada, Cuba, Germany, Japan, New Zealand, Poland, Rhodesia, USA and Yemen Arab Republics, were field evaluated in three separate experiments and the results of this study are briefly discussed.

MATERIALS AND METHODS

In the first experimental trial, fifty three exotic genotypes were evaluated with three standard checks, Jayasree and CTRI strain and one advanced breeding line 2178, during the crop season of 1979-81. These 56 genotypes were grown in a rectangular lattice design with three replications. In the second set, twenty seven exotic genotypes were evaluated against three standard varieties, Jayasree, CTRI Special and Godavari Special during 1982-85 in a randomized block design with three replications. In the third set, nineteen exotic genotypes were evaluated against five standard varieties, Jayasree, CTRI Special, Godavari Special, Jayasree MR and CTRI Special MR during 1983-85 in a randomized block design with three replications.

In all the sets, each plot consisted of 28 plants distributed in four rows of seven plants under spacing of 80 cm × 50 cm, respectively. The experimental area received uniform fertilizer of 25 kg N, 50 kg P_2O_5, 50 kg K per/ha and the crop was unirrigated and untopped. The leaf from each plot was harvested as and when mature and then flue-cured and graded. A composite sample from each plot was taken for physical (EMC, Filling Value and Shatter Index) and chemical (Nicotine and Reducing Sugars) evaluation. For characters like plant height, size and number of leaves per plant (total and economic), five random plants spread over the entire plot were tagged, the height was recorded from ground level to the crow's foot.

RESULTS AND DISCUSSION

The results reported in this paper pertain to the black soil tobacco. The differences due to varieties were significant for all kinds of yields in the individual seasons and as well as in the combined analysis. The varieties, F 207, Relia-9, Mc Nair 944, Mc 1, MRS-2 and the advanced breeding line L-2178 gave higher yields of all kinds and were at par with the highest yielding standard variety Jayasree. In the second set, thirty varieties were evaluated during 1982-83 to 1984-85. The differences due to varieties were significant for all kinds of yield. The varieties, NC 98, Coker 86., Speight G 70 and the standard variety Jayasree gave more than 1,700 kg of cured leaf per hectare though their differences were not significant. However, in quality and leaf production, the variety Jayasree topped the list closely followed by Coker 316. In another set, 24 varieties were evaluated from 1982-83. Two years yield data showed that varieties V 156, Virgin Aurea and Riwaka 1 gave significantly higher yields of green and cured leaf than the standard variety Godavari Special. In bright leaf V 156 alone, gave significantly higher yield than Godavari Special. Variety Riwaka 1 gave significantly higher yield than the three standard varieties.

CONCLUSION

It is revealed from the data of the three experiments that the standard variety Jayasree was better in its quality leaf production (TBLE). Varieties 584/80, V 156 and NC 98 were high cured leaf yielders. The varieties Va 407, NC 12 and NC 744 recorded higher values of nicotine even under untopped and unirrigated conditions. The above varieties could be used as donor parents in the improvement of yield and quality of the flue-cured tobacco grown in the heavy black soils under rainfed conditions.

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