of selfing was probably low. Concurrent with selection for low internal CO₂ concentration, visual selection of field-grown roots was used to eliminate sprangled or colored roots. Internal CO₂ concentrations of F₁₀₀₈ were approximately 40% of those observed in the commercial hybrids ‘KW 1132’ and ‘Beta 1230’.

F₁₀₀₈ (GP-121) is a multigerm, green hypocotyl line selected from the same base population and in the same manner as F₁₀₀₇. The maternal parents of the selections used in the pair-cross that resulted in F₁₀₀₈ were PI 169016, from Turkey, and PI 181716, from Lebanon. Internal CO₂ concentrations of F₁₀₀₈ were usually slightly higher than those of F₁₀₀₇ but still only about 50% of that observed in KW 1132 and Beta 1230.

Both lines have been evaluated in replicated field trials for 2 yr at Fargo, ND. Root yield of F₁₀₀₈ has been about equal to adapted commercial hybrids; however, the fresh weight sucrose concentration was only about 60% of the hybrids. Clear juice purity percent was about 4% below the hybrids. F₁₀₀₈ yielded about 70% of the check hybrids and was slightly lower than the commercial checks for sucrose and purity percent. These lines are intended for use as pollinators for experimental hybrids, as parents in genetic studies, and as genetic sources for the development of parental lines with reduced sucrose loss due to respiration. Low storage-respiration rate is intended to complement other methods of reducing storage losses such as reduced root injury and pile ventilation.

Breeder seed will be maintained by USDA-ARS and provided in quantities sufficient for reproduction upon written request to Sugarbeet Research, USDA-ARS, Agronomy Department, North Dakota State University, Fargo, ND 58105.

L. G. Campbell,* AND D. F. Cole (2)

References and Notes

2. L.G. Campbell, USDA-ARS, Fargo, ND 58105; and D.F. Cole, USDA-ARS, Beltsville, MD 20705 (formerly, USDA-ARS, Fargo, ND). Joint contribution of USDA-ARS and North Dakota Agric. Exp. Stn. as Journal Article no. 1595. Registration by CSSA. *Corresponding author. Accepted 30 July 1987.


REGISTRATION OF THREE ROOT KNOT NEMATODE RESISTANT BURLEY TOBACCO GERMPLASM LINES

Three burley tobacco (Nicotiana tabacum L.) germplasm lines (Reg. no. GP-23–GP-25) (PI 511339–511341) resistant to race 1 of the root knot nematode [Meloidogyne incognita (Kofoid & White) Chitwood] were developed by the North Dakota Agricultural Experiment Station (NDAES) at Fargo, ND. Two lines have been released by NDAES for use in the development of root knot nematode resistant tobacco cultivars. The lines are: Hi Burley 21 (‘GP-23’), a backcross-derived line having a mean rac 1-2-8 nematode population of < 1000 nematodes g⁻¹; and ‘GP-24’, a backcross-derived line having a mean rac 1-2-8 nematode population of < 1000 nematodes g⁻¹. These lines are recommended for burley tobacco cultivars because of their high levels of resistance to root knot nematodes and for use in the development of root knot nematode resistant tobacco cultivars.

Both Hi Burley 21 and ‘GP-24’ have been used as parent genotypes for agronomic, physiological, and root knot nematode resistance traits. Both lines have been proven to be highly resistant to root knot nematodes in field trials. Requests for seed may be made to the Director, Sugarbeet Research, USDA-ARS, Box 50, Fargo, ND 58105.