average 51 lost (Table 1), the 200 selected plants are represented in the next generation by only 114 of the 200 selected as females. Thus Ne = [4 (100) (57)]/(100 + 57) = 145 and the estimated inbreeding per generation is equal to (1/2 X 145) = 0.345%. It is apparent, therefore, that the loss of 31% of the half-sib families per cycle should have very little effect on the percentage of inbreeding in the population. Neither should this loss significantly reduce the progress in yield realized from a number of RRPS cycles. Experimental support for this statement can be found in the 1982 spaced-plant-population-progress test in which RRPS Cycle 1 to 4, 4 to 6, and 6 to 9 made respective mean yield gains of 14.0, 19.5, and 24.0% per cycle (3).

In 35 computer generated populations of 252 plants (6 plants/42 half-sib families) reducing the percent of the plants selected from 25.0 to 8.3 increased the percent of half-sib families lost from 20.3 to 61.2 (Table 2). Selecting and intermitting 21 plants (1/12 plant grid) per cycle lost 61% of the half-sib families and increased the estimated level of inbreeding per cycle to 2.38% per cycle (4). Had only eight plants been saved, the loss of half-sib families would have been greater and the estimated level of inbreeding per cycle would have increased to 6.25%. This demonstrates the importance of maintaining a relatively high Ne (effective population number) to prevent high accumulated levels of inbreeding during the RRPS process which can hinder or prevent progress after several cycles of selection.

A determination of the frequency with which progenies of selected superior plants were recovered with the gridded RRPS selection procedure showed that they were not recovered with equal frequency. In four populations with family numbers of six examined, 51% of the selected progenies were recovered only once whereas 3.3 and 0.8% were recovered four and five times, respectively (Table 3). A system requiring equal representation from each family in the polycross for the next cycle would permit a slower rate of progress than that realized in the polycross for the next cycle.

Acknowledgement

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References


Registration of Crop Cultivars

REGISTRATION OF POST BARLEY

‘Post’ barley (*Hordeum vulgare* L.) (Reg. no. 192), C.I. 15695, is a winter feed cultivar developed and released by the Oklahoma Agricultural Experiment Station and distributed to growers in 1977. Post originated as an F3 head selection from the cross ‘Harrison’/‘Will’. It was grown as a head row in 1971 and assigned the selection number OK7110566.

Post is a short-strawed, 6-rowed, rough-awned barley with mid-to late-season maturity. Early plant growth is semi-prostrate when fall-seeded. Spikes are short and dense with rachis internodes approximately 2 mm in length and edged with long hairs. Glumes are partially covered with long hairs and are approximately one-half the length of the lemma and awns. Lemma awns are long and glume awns are longer than the glumes. The covered kernels have a white aleurone and have a few lemma teeth on the lateral and marginal nerves. Hulls are slightly to semi-wrinkled. Post exhibits good straw quality and lodges less than ‘Will’ or ‘Kerr’. Post is resistant to all known biotypes of the greenbug (*Schizaphis graminum* Rond.), and recent research laboratories indicate that it has a high level of resistance to the barley yellow dwarf virus. Post exhibits net blotch, incited by *Pyrenophora teres* (D.C.) Merat powdery mildew, incited by *Erysiphe graminis* f. *sp. hordei* Em. Marchal. It also exhibits some resistance to leaf rust, incited by *Puccinia hordei* (Otth.) Tode et Toth. and net blotch. The 27 tests where survival data were reported, Post was among the top six entries in yield in every year. It was evaluated for winterhardiness in the Barley Winterhardiness Nurseries grown at a number of locations in the United States and Canada in 1975. It had an average survival of 67.6%, while ‘Kanby’ had an average survival of 66% in the 27 tests where survival data were reported.

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