Register of Australian Herbage Plant Cultivars

A. Grasses
3. Phalaris
Phalaris aquatica L. (phalaris) cv. Uneta

Reg. No. A-3a-7
Registered October 1982

Published in Journal of the Australian Institute of Agricultural Science 48 (3), 189-91. 1982

Origin (1,4)

Derived solely from the Australian cultivar. Original plant was discovered by Dr. J.R. McWilliam and Mr. H.E. Shroeder of the Division of Plant Industry, CSIRO, in a population of 5000 spaced plants on the Ginninderra Experiment Station, A.C.T. which had been grown for certified seed in N.S.W. This single plant of phalaris retained all seed firmly in the inflorescence at full maturity. The remainder of the population by comparison lost an average of 50% of its seed within two weeks of the appearance of the first mature seed. This natural seed retaining mutant was self-incompatible and was allowed to cross at random with the other members of the population. Plants raised from the first cross seed were intercrossed in isolation and four seed retaining genotypes were recovered from the half-sib progenies. The segregation ratio of approximately 256:1 in this F2 generation suggested that four recessive genes control the expression of seed retention in this population. These four seed retaining genotypes plus the original mutant, when intercrossed, showed no further segregation, giving progeny that retained all seed at maturity. Four further cycles of recurrent selection to improve inflorescence quality and plant type have been completed at the University of New England (3) and this has confirmed the stability of this homogeneous recessive genotype, and has produced the first full seed retaining cultivar of *P. aquatica*.

Submitted for registration by the Department of Agronomy and Soil Science, University of New England. The Department will be responsible for maintaining breeders'seed. Recommended for registration by the N.S.W. Herbage Plant Liaison Committee. Registered October 1982.

Morphological description (1,3)

Unita differs morphologically from the Australian cultivar at maturity by the presence of a well developed non-brittle rachilla which remains intact after maturity and anchors the fertile lemma containing the caryopsis (seed) firmly in the spikelet, irrespective of the shape and configuration of the glumes. This mechanism contrasts with the existing seed shattering cultivars of phalaris in which the fragile, ribbon-like rachilla fractures at maturity, leaving the seed lying free in the glumes. The stout rachilla of the new cultivar varies somewhat in length, depending on the genotype. Well-developed sterile lemmas are also a feature of this cultivar (1). Other associated features are the somewhat stouter culms, which are more resistant to breakage during seed maturation and the inflorescences which remain intact long after seed maturation. The seed size, shape and number per kilogram are no different from Australian.

Agronomic characters (1,2,3)

Uneta resembles Australian in its agronomic performance and, although some selection has been practiced for improved vigour as spaced plants, there is no evidence that the cultivar differs from Australian, except that it reaches anthesis 5 to 7 days later. A comparison of seedling vigour (2) indicates that Uneta is comparable to Seedmaster but these seedlings are only approximately two thirds as large as those of Sirosa and Sirolan. The seed of Uneta, because it is harvested at full maturity, is potentially of higher quality and has good viability and germinability. Dry matter yields from pure phalaris swards of Uneta and Australian indicate that Uneta had a 38% advantage in the first spring due to superior establishment but that, in the subsequent autumn and spring, the yields were not significantly different, although still favouring Uneta by 15% (2). The major difference between Uneta and the other phalaris cultivars (Australian and Seedmaster) it is intended to replace is in the yield of clean seed. The Australian cultivar loses on average 75% of all seed in the inflorescence as a result of

seed shattering during the 20 days following seed maturity (around 30-35 days from mid-anthesis). Uneta lost only about 5% in the same period (2). When all three cultivars (Uneta, Seedmaster and Australian) were grown at Armidale, N.S.W. and harvested at the time of maximum yield of mature seed, Uneta produced 41% more clean seed than Seedmaster and 88% more than Australian (2). These results indicate that Uneta can be harvested by direct heading up to any time up to three weeks after stand maturity, without suffering any loss of seed. This will improve the flexibility and ease of harvest and the yield and quality of seed obtained.

References

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