Registration of STARS-93016 Barley Germplasm Resistant to Russian Wheat Aphid

STARS-93016 (Reg. no. GP-132, PI 573080) is a six-row spring barley (Hordeum vulgare L.) developed by the USDA-ARS as a source of resistance to the Russian wheat aphid (RWA) [Diuraphis noxia (Mordvilko)]. This line is a selection from PI 366450. PI 366450 was collected in Afghanistan by J.D. Gray of Reading University, Surrey, England. It was donated to the USDA National Plant Germplasm System in 1966. Before selection, PI 366450 was heterogeneous for RWA resistance with damage ratings of individual plants ranging from 2 to 9 on a scale of 1 to 9 (1 = no damage to 9 = dead plant). Seedling tests, 3 wk after emergence, indicated that PI 366450 also segregated for plant height with dwarf seedlings of ~12 cm, compared with normal seedlings of ~56 cm. Plants were selected on the basis of RWA resistance (damage rating of 2) and normal seedling height (~50 cm), and their progeny were evaluated for RWA resistance before seed was bulked for release. The susceptible barley check ‘Morex’ (C1ho 15773) was rated as 9 (dead plant) in the same test.

STARS-93016 is uniformly resistant (damage rating of 2) to the Russian wheat aphid based on seedling tests in the greenhouse using greenhouse-reared RWA colonies. Further testing has shown this resistance to persist when plants are grown to maturity in the greenhouse under constant RWA infestation (1). RWA-infested leaves of STARS-93016 develop normally, while leaves of susceptible plants (Morex) are rolled, thereby trapping the awns and constraining normal spike emergence. This adversely affects seed set and development, and results in yield reduction (1). Results of field studies under natural RWA infestations confirmed the high level of RWA resistance of STARS-93016 detected in greenhouse tests. RWA damage ratings for Morex and STARS-93016 tested as seedlings in the greenhouse were 7.3 and 2.0, respectively. Under field conditions at Laramie, WY, in 1993, on a per plot basis, 39% of Morex tillers were damaged (ratings of 4 to 7) and 8% of STARS-93016 tillers were damaged (ratings of 1 to 2). With RWA feeding, Morex and STARS-93016 yielded 53 and 114% of their respective noninfested checks. Yield reduction due to young tiller mortality, which is primarily tolerance, with antibiosis as a secondary mechanism (3). Electronically monitored feeding tests on the original source of resistance (PI 366450) showed that the aphid did not readily penetrate the phloem (4).

Written requests for small quantities (5 g) of seed should be sent to the corresponding author. Appropriate recognition of the source of this germplasm should be given whenever it is used for research or breeding purposes. Seed stock will be maintained at the Plant Science Research Laboratory, Stillwater, OK.

D. W. MORHNINWEG,* D. R. PORTER, AND J. A. WEBSTER

References and Notes


REGISTRATION OF GENETIC STOCKS

Registration of Curly-leaf Peanut Genetic Stock

Curly-leaf peanut (Arachis hypogaea L. subsp. hypogaea var. hypogaea) genetic stock (Reg. no. GS-3, PI 578012) was released by the Georgia Agricultural Experiment Stations in 1993. It was identified in 1978 as an aberrant offtype plant, and subsequent selfing established a true breeding genotype.

Curly-leaf peanut genetic stock may be obtained upon written request to the author.