Registration of KS221 Multiple Pest-Resistant Alfalfa Germplasm

KS 221 ALFALFA (Medicago sativa L.) germplasm (Reg. no. GP-261, PI564166) was released by the USDA-ARS and the Kansas and Washington Agricultural Experiment Stations in July 1992. It provides resistance to anthracnose [caused by Colletotrichum trifolii Bain & Essary, Race 1]; bacterial wilt [caused by Clavibacter michiganense subsp. insidiosum (McCull.) Davis et al.]; downy mildew [caused by Peronospora trifoliorum deBary]; fusarium wilt [caused by Fusarium oxysporum Schlechtend.:Fr. f. sp. medicaginis (J. L. Wiemer) W. C. Snyder & H. N. Hans.]; phytophthora root rot [caused by Phytophthora medicaginis E. M. Han. & Maxwell]; verticillium wilt [caused by Verticillium albo-atrum Reinke & Berthier]; the pea aphid [Acyrthosiphon pisum (Harris)]; and the spotted alfalfa aphid [Theroephis maculata (Buckton)].

KS 221 was derived from BIC-7 (1). The BIC population was developed from 75 diverse (hardy and nonhardy) sources of germplasm. BIC-7 was subjected to recurrent phenotypic selection for resistance to anthracnose (six cycles), bacterial wilt (two cycles), downy mildew (eight cycles), fusarium wilt (two cycles), phytophthora root rot (four cycles – two each in field and greenhouse), verticillium wilt (one cycle), pea aphid (five cycles), and spotted alfalfa aphid (five cycles). Independent culling was practiced but all pests were not included in each cycle. Over 100 plants from the last cycle were intercrossed by hand pollination in the greenhouse. Syn 2 seed was produced by intercrossing approximately 250 Syn 1 plants in a field cage. Honeybees (Apis mellifera L.) were used for pollination.

At St. Paul, MN, the percentages of resistant plants were: bacterial wilt – KS 221 = 43, ‘Vernal’ (R) = 42, ‘Narragansett’ (S) = 3; fusarium wilt – KS 221 = 71, ‘Agate’ (R) = 54, MNGN-1 (S) = 7; phytophthora root rot – KS 221 = 63, Agate (R) = 43, ‘Saranac’ (S) = 6. In a seeding test at Prosser, WA, the percentages of plants resistant to verticillium wilt were: KS 221 = 32, ‘Vertus’ (R) = 39, and Saranac (S) = 1.

Seedling tests to evaluate resistance to anthracnose, downy mildew, blue alfalfa aphid, pea aphid, and spotted alfalfa aphid were conducted at Manhattan, KS. The percentages of plants resistant to anthracnose (Race 1) were: KS 221 = 36, ‘Saranac AR’ (R) = 44, and Saranac (S) = 1. The percentages of symptomless plants in tests with three downy mildew fungus isolates and KS 221 and the resistant and susceptible controls is shown in Table 1.

Table 1. Percentages of symptomless alfalfa plants challenged by three downy mildew isolates at Manhattan, KS.

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<th>Downy mildew isolates</th>
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Five grams of KS 221 are available for evaluation, when KS 221 germplasm contributes to a new cultivar or hybrid. Seed stocks are maintained by the Department of Agronomy, Kansas State University, Manhattan, KS 66506.


References and Notes


Registration of KS222 Multiple Pest-Resistant Alfalfa Germplasm Derived from 'Anchor'

KS 222 ALFALFA (Medicago sativa L.) germplasm (Reg. no. GP-262, PI564167) was released by the Kansas Agricultural Experiment Station. This germplasm provides resistance to anthracnose (Race 1); bacterial wilt (5 cycles), anthracnose (3 cycles), pea aphid (3 cycles), and spotted alfalfa aphid (5 cycles). Independent culling was practiced but all pests were not included in each cycle. Over 100 plants from the last cycle were intercrossed by hand pollination to initiate each cycle of selection. Syn 2 seed was produced by intercrossing approximately 250 Syn 1 plants in a field cage. Honeybees (Apis mellifera L.) were used for pollination.

At St. Paul, MM, the percentages of resistant plants were: bacterial wilt = KS 222 = 55; fusarium wilt = KS 222 = 30; phytophthora root rot = KS 222 = 30; pea aphid = KS 222 = 81, ‘Riley’ (R) = 62, pea aphid = KS 222 = 76, Kanza (R) = 72, Ranger (S) = 42, ‘Narambert’ (S) = 4. In field trials, we identified Anchor as possessing tolerance to the alfalfa weevil [Hypera postica (Gyllenhal)]. KS 222 [Hypera postica (Gyllenhal)] was produced by intercrossing approximately 250 Syn 1 plants in a field cage. Honeybees (Apis mellifera L.) were used for pollination.

Seedling tests to evaluate resistance to anthracnose, downy mildew, blue alfalfa aphid, pea aphid, and spotted alfalfa aphid were conducted at Manhattan, KS. The percentages of plants resistant to anthracnose (Race 1) were: KS 222 = 36, ‘Saranac AR’ (R) = 44, and Saranac (S) = 1. The percentages of symptomless plants in tests with three downy mildew fungus isolates and KS 221 and the resistant and susceptible controls is shown in Table 1.

Table 1. Percentages of symptomless alfalfa plants challenged by three downy mildew isolates at Manhattan, KS.

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Five grams of KS 222 are available for evaluation, when KS 222 germplasm contributes to a new cultivar or hybrid. Seed stocks are maintained by the Department of Agronomy, Kansas State University, Manhattan, KS 66506.

E. L. Sorensen,* D. L. Stuteville, E. K. Horber, and R. N. Peaden

References and Notes

