epiphytotics in 1981 and 1982, FC 711 had a mean disease index of 2.9 (scale of 0 to 7) compared with 2.7 for FC 703 (resistant check) and 5.8 for FC 901 (susceptible check). The percentage of harvestable roots for the three lines was 68, 72, and 12, respectively. With a set of 10 male sterile testers, the hybrids involving FC 711 had lower average sucrose production than several other resistant germplasms in the program, primarily as a result of lower sucrose content. However, the diversity of this FC 711 germplasm provides the potential for breeders to develop highly productive resistant hybrids with currently used monogerm male sterile parents. Hence, this germplasm is released for potential use as a pollinator, or as a source for development of pollinators in the breeding of rhizoctonia-resistant hybrid varieties by sugarbeet breeders.

Breeder seed is maintained by USDA-ARS, and will be provided to sugarbeet breeders in quantities adequate for reproduction. Written requests for seed should be made to Sugarbeet Production Res., USDA-ARS, Crops Res. Lab., Colorado State Univ., Fort Collins, CO 80523.

REGISTRATION OF RHA 309, RHA 310, AND RHA 311
SUNFLOWER GERMPLASMA
(Reg. Nos. GP 11 to GP 13)

J. F. Miller, T. J. Gulya, and W. W. Roath

Three nonoilseed sunflower (Helianthus annuus L.) germplasm lines, RHA 309, RHA 310, and RHA 311, were developed cooperatively by USDA-ARS and the North Dakota Agricultural Experiment Station, Fargo, N. Dak., and released in 1982. These lines are selections from previously released lines RHA 293 and RHA 294 and are an improvement in combining ability, uniformity, and pollen fertility. The lines have six recessive branching genes in a cytoplasmic male sterile background and are released for use as male parents in nonoilseed hybrids. RHA 309 has basal, recessive branching and RHA 310 and RHA 311 have upper, recessive branching, all of which have an extended period of pollen production.

RHA 309 is an S4 single plant selection derived from the parental line RHA 293. RHA 293 was a composite of seed of nine F2 lines from the cross cms HA 155/HIR 34/2/RHA 282. RHA 309 was specifically selected for a high degree of basal branching and uniformity in seed quality characteristics (achene size and color). Flowering date and plant height of RHA 309 are equal to those of RHA 293. In testcrosses with female lines cms HA 288 and cms HA 292, hybrids have been 12% higher in yield and more uniform in hull color characteristics (primarily black with white stripes down the sides) when compared with Hybrids 883 and 923. The mean yield of Hybrids 883 and 923 was 2210 kg/ha. The hybrids did not differ from the checks in flowering date, height, seed size over a 20/64 inch screen, and nutmeat percentage.

RHA 310 is an S4 single plant selection derived from the parental line RHA 294. RHA 294 was selected from a multiple cross involving cms PI 343763, Bonita Giant/Manchurian, HA 61, Mennonite RR, and cms MennRR-18-1*3/T66006-2. RHA 310 flowers (primary bud) 3 d later than RHA 294 and will flower at approximately the same time as the female lines cms HA 292, cms HA 304, and cms HA 305. In testcrosses with female lines cms HA 288 and cms HA 292, hybrids were 13% higher yielding, flowered 1 d later, were 5 cm taller, and were equal in seed size, nutmeat percentage, and hull color characteristics when compared with Hybrids 884 and 924. The mean yield of Hybrids 884 and 924 was 2280 kg/ha.

RHA 311 is an S4 single plant selection also derived from the parental line RHA 294. RHA 311 flowers 2 d earlier (primary bud) and is 8 cm shorter in plant height than RHA 294. This line was selected to correspond in flowering date with earlier flowering female lines developed by industry breeding programs. In testcrosses with female lines cms HA 288 and cms HA 292, hybrids have been 7% higher in yield, 1 d earlier in flowering, 5 cm shorter in height, and have equal seed size, nutmeat percentage, and hull color characteristics when compared with Hybrids 884 and 924. Even though the hybrids were earlier flowering, maturity dates were equal to the check hybrids.

All three RHA lines and their hybrids are resistant to Race 2 or the Red River Valley race of downy mildew incited by Pseudomonas halstedii (Faur.) Berl. & de Toni, and are moderately resistant to rust, incited by Puccinia helianthi Schw. The three lines are susceptible to North American races of Verticillium wilt, incited by Verticillium dahliae Klebahn. These lines also produced hybrids that were significantly more uniform in height and flowering than the check hybrids.

Limited quantities of seed of each germplasm line are available from the Seedstocks Project, Agronomy Dep., North Dakota State Univ., Fargo, ND, 58105.

REGISTRATION OF ARK 2301, ARK 2014, ARK 2307, AND ARK 2309 TRITICALE GERMPLASM
(Reg. Nos. GP 6 to GP 9)

K. D. Beatty and I. L. Eldridge

Four triticales (X Triticeae Wittmack) have been developed for release as parental germplasm for forage and grain-type triticales in Arkansas and other mid-south and southern United States locations. Grower acreage of triticale continues to expand in the south primarily for annual forage production in dairy and cow-calf operations.

The germplasm lines originated from introduced F3 bulks from California planted in 1976-1977 at Keiser, Ark., at the Northeast Research and Extension Center. Limited selection for spike fertility had been applied to the parental source populations of each line prior to introduction to Arkansas. All of the parents and progeny populations from which Ark 2014, Ark 2301, Ark 2307, and Ark 2309 were selected had putative spring habit. Selections for spike fertility, general disease resistance, and adaptability were made from each population in 1977 and selected plants were bulked into F4 composites. Replicated testing in small plots began during the 1977-1978 season. The lines have been tested in the Uniform Winter or Spring Triticale Nurseries sponsored by Alabama A and M University at Normal, Ala., since 1979 and in Arkansas statewide trials since 1978. All lines are considered to be hexaploid types although this has not been cytologically confirmed. Ark 2014 (GP 7). Ark 2014 was developed by the Jenkins Foundation for research at Salinas, Calif., as a spring triticale and released as ‘FastGro 204’ in 1970. PPV-21 is a spring habit experimental line developed by CIMMYT in Mexico. Ark 2014 is highly self-pollinated with only occasional out-crossing. Seeds are relatively plump and the test weight compares favorably (64.6 kg/ha) with other triticales. Disease infection from Septoria tritici and Puccinia recondita f. sp. tritici (leaf rust) has been less on