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DEVELOPMENT OF IMPROVED VEGETABLE LEGUME VARIETIES FOR TEXAS

Douglas Scheuring, J. C. Miller, Jr., and D. R. Earhart

Over 40,000 acres of cowpeas are reported to be produced in Texas annually for the fresh market, processing, or seed, with as much as 100,000 acres for green manure or forage. The mungbean is an important short duration annual which is grown as a monocrop or as an intercrop. Mungbeans are frequently planted in rotation with wheat on 20,000+ acres in Texas. The Texas crop is grown for the Oriental food industry for use as bean sprouts. Dry beans, specifically pinto beans, have recently received much attention as an alternative crop in the state. Texans consume more pintos than any other state, the majority of which are produced out of state. Commercial acreage in Texas has increased from about 1,000 acres in 1980 to more than 10,000 in 1990. Cowpea, mungbean, and pinto bean are important vegetable legumes in Texas; however, as with all crops, varietal improvements need to be made.

The Texas Agricultural Experiment Station project entitled, "Development of Improved Vegetable Legume Varieties for the Southwest", has as its primary purpose the development and/or identification of varieties which possess superior plant characteristics. Favorable characteristics include yield, upright plants with pods at or above the foliage, and drought and disease resistance. The major emphasis is on fresh product appearance and high quality product for freezing and canning.

For a number of years, the project has participated in the Regional Southernpea Cooperative Trial. In 1980, a limited mungbean improvement program was initiated which included involvement in the International Mungbean Nursery Trials of the Asian Vegetable Research and Development Center. Since 1989, the project has participated in the National Cooperative Dry Bean Nurseries.

Each year variety and advanced selection trials are planted at College Station, Weslaco, Temple, Lubbock, and Overton. About 800-1000 different varieties and lines make up these trials. They are planted in replicated and nonreplicated plots. The objective of these trials is to test the varieties and advanced selections: (1) to determine their adaptability to Texas environmental conditions, (2) to determine their potential as new or replacement varieties for those presently used, and (3) to identify

potential parents for use in the breeding program.

In 1988, the Texas Agricultural Experiment and the Asian Vegetable Research and Development Center announced the joint release of 'TexSprout' mungbean. The major advantages of TexSprout include high seed and sprout yields, wide adaptability, synchronous flowering and fruiting, lodging and shattering resistance, erect growth habit, and large seeds.

In 1990, the Texas Agricultural Experiment Station released 'Texas Pinkeye' cowpea. The major advantage of Texas Pinkeye is that it produces equal or greater yield to the standard variety Pinkeye Purple Hull-BVR (Table 1), yet it is 10-14 days earlier. Under close row spacing trials, Texas Pinkeye has almost double the yield of Pinkeye Purple Hull-BVR (Table 2). Texas Pinkeye also has an upright stature with its pods at or above foliage level, which makes it ideal for hand or machine harvest. Seed of both TexSprout and Texas Pinkeye is available from Texas Foundation Seed Service, (409) 845-4051.

The Overton trial consists of several breeding lines which were selected as fresh market and garden types. These lines are still in the developmental stage. A Pinkeye trial is included so that visual and yield differences can be measured. TexSprout mungbean and several pinto bean lines have also been planted for observation in the East Texas area.

Yield results of a pinto bean breeding line/cultivar trial at Lubbock, Texas in 1990 are presented (Table 3).

Table 1. Regional Southernpea Cooperative Trial comparing yield of Texas Pinkeye and Pinkeye Purple Hull-BVR at ten locations with various row spacing, 1990.

Location	Row spacing (in)	Texas Pinkeye (lbs/ac)	Pinkeye Purple Hull-BVR (lbs/ac)	Yield diff.
Milstead, AL	42	3006	2818	188
Fayetteville, AR	42	1347	1252	95
Hope, AR	36	2475	1964	511
Kibler, AR	18	2145	1284	861
Calhoun, LA	40	2300	1749	551
Charleston, SC	40	1906	1749	157
Jackson, TN	30	621	390	231
College Station, TX	40	590	67	523
Lubbock, TX	40	2952	1465	1487
Overton, TX	40	1086	415	671
Mean		1843	908	935

Table 2. Regional Southernpea Cooperative High Density Trials comparing yields of Texas Pinkeye and Pinkeye Purple Hull-BVR at two locations over two years, 1989-1990.

Location	Row spacing (in)	Year	Texas Pinkeye (lbs/ac)	Pinkeye Purple Hull-BVR (lbs/ac)	Yield diff.
Kibler, AR	18	1989	3402	1565	1837
Jackson, TN	30	1989	1708	1272	436
Kibler, AR	18	1990	2145	1284	861
Jackson, TN	30	1990	621	390	231
Mean			1969	1128	841

Table 3. Pinto bean breeding line/cultivar yield trial - Lubbock Texas, 1990²

Breeding line/cultivar	Yield (lbs/ac)
UI 129	1995
UI 126	1907
Othello	1892
Olathe	1861
UI 114	1831
Sierra	1460

²Planted on 40 in. row spacing.