

Agronomy Guide

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CROPS (SOYBEANS)

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Public Soybean Varieties for Indiana (1997)

*J. R. Wilcox, T. S. Abney and E. P. Christmas
USDA-Agricultural Research Service and
the Departments of Agronomy and Botany and Plant Pathology
Purdue University*

Public soybean varieties are developed by Land Grant University Agricultural Research Programs and the U.S. Department of Agriculture and released to the public. Varieties developed in one state are released simultaneously in several states where they are adapted, broadening the choice of highly productive, disease-resistant varieties in each state.

Soybean producers have a wide choice among the many soybean varieties, both public and proprietary, that are offered for sale. Many of these are well-adapted to production in Indiana and have rather similar yield potential in their areas of adaptation within the state. However, these varieties may differ in other important traits that can affect production such as maturity, disease resistance, lodging resistance, or seed size.

This publication summarizes the performance characteristics of most public soybean varieties offered for sale in Indiana. The data are from USDA-Agricultural Research Service and Purdue University Agricultural Research Programs cooperative breeding trials. Brief variety descriptions are provided to highlight some of the strengths, weaknesses, and special attributes of each variety (Table 1). Performance data for these varieties, including chemical composition of the seed, are given in Table 2. In Table 2, the LSD 0.10 (Least Significant Difference at the 0.10 probability level) is included for comparisons among variety means for each trait. Differences among means that are less than the LSD are probably due to chance. Differences among

means that are equal to or greater than the LSD are probably due to genetic differences among these varieties.

To compare the performance of private soybean varieties, refer to Purdue University Agricultural Research Programs Bulletin No. B 740, "Performance of Public and Private Soybeans in Indiana, 1996," which is available from local Purdue Cooperative Extension Offices or the Agricultural Media Distribution Center, 301 South 2nd St., Lafayette, Indiana 47901-1232.

Testing Methods

Tests for variety comparisons were conducted in four-row plots, with data recorded on the center two rows of each plot. All plots were 16 feet in length, but trimmed to 12 feet in length prior to harvest. Row spacing was 24 to 26 inches and three replications of each test were grown in each of the designated years. Plots were kept weed free with pre-plant and post-emergence herbicides and hand weeding as needed. The center two rows of each plot were harvested with a plot combine for yield determinations.

Yield was recorded as grams of seed, air-dried to a uniform moisture content of about 13%, and converted to bushels per acre. Maturity date was recorded as the date when 95% of the pods had their mature color. Normally another week would be required before the plants would be dry enough to combine. Plant height was measured from the soil surface to the tip of the main stem at maturity. Lodging was scored from 1.0,

all plants standing erect, to 5.0, all plants lodged flat. Seeds-per-pound were based on the average weight of 100 seeds. Seed quality was scored from 1.0 for very good quality to 5.0 for very poor quality. Protein and oil contents were determined on a 25-gram sample of clean seed by infrared transmittance, at the USDA-ARS National Center for Agricultural Utilization Research, Peoria, Illinois.

Variety Descriptions:

Maturity Group II

Archer was developed at the Iowa Agricultural Experiment Station and released in 1990. It is a very early maturing Group II variety that has moderately good resistance to brown stem rot, a disease that has become more prevalent in Indiana in recent years. It is moderately resistant to lodging. Archer has both the Rps1-k and Rps6 alleles for resistance to Phytophthora rot and, with these two alleles, is resistant to all of the frequently isolated races of this pathogen in Indiana. It is adapted to production in the northern third of the state.

Burlison was developed by the Illinois Agricultural Experiment Station and released in 1988. It is a late Group II variety that combines good yield potential with excellent resistance to lodging. Burlison has two alleles, Rps1-b and Rps3, that confer resistance to all of the frequently isolated races of Phytophthora that occur in Indiana. It has averaged slightly higher in seed protein concentration than other Group II varieties. It is adapted to production in the northern half of Indiana. *Burlison is sensitive to metribuzin (Lexone, Sencor, Preview); therefore, these herbicides should not be used in its production.* The reaction to metribuzin is due to a close linkage of a gene for sensitivity to this herbicide with the Rps1-b gene for Phytophthora resistance.

Chapman was developed by the Ohio Agricultural Research and Development Center and was released in 1990. It has excellent yield potential and lodging resistance. It has the Rps3 allele for resistance to Phytophthora and is

resistant to all but one of the frequently isolated races of this pathogen in Indiana. Chapman is well adapted to production in the northern half of the state.

IA2008R (New for 1997) was developed by the Iowa Agricultural Experiment Station and released to certified seed producers in 1996. This variety has the Rps1-k allele for resistance to Phytophthora and is resistant to six of the nine most frequently occurring races of this pathogen in the state. It also is moderately resistant to brown stem rot, a disease that is becoming more prevalent in Indiana. IA2008R has small seeds compared to most other soybean varieties. It is well adapted to production in the northern half of Indiana.

IA2022 (New for 1997) was developed at the Iowa Agricultural Experiment Station and released to certified seed producers in 1996. This variety has produced exceptionally high yields for a Group II variety. IA2022 does not have known major genes for resistance to Phytophthora and should not be grown where this disease has reduced stands, resulted in low plant vigor or poor yields. This variety is well adapted to production in the northern half of Indiana.

Kenwood 94 is a backcross derivative of the variety Kenwood developed by the Iowa Agricultural Experiment Station and released in 1994. This variety has excellent yield potential, good resistance to lodging, and has the Rps1-k allele for Phytophthora resistance. This variety has smaller seed size than many of the other Group II varieties. It is well adapted to production in the northern half of the state.

Maturity Group III

Charleston was developed by the Ohio Agricultural Research and Development Center and released in 1992. This is a determinate variety, shorter than indeterminate varieties, and has excellent lodging resistance. Charleston is best adapted to production in narrow rows at plant populations 50 to 70% higher than populations for indeterminate varieties. Since the yield data from these performance tests were from 24- to

26-inch rows, the full yield potential of Charleston may not have been expressed in these tests.

Edison was developed by the Ohio Agricultural Research and Development Center and released in 1990. It matures about two days later than Resnik, and has excellent yield potential and resistance to lodging. Edison has the smallest seed of any Group III variety in these tests. It has the Rps1-k allele for Phytophthora resistance. This variety is well adapted to production in the central two-thirds of the state.

Harper 87, a backcross derivative of Harper, was developed by the Iowa Agricultural Experiment Station, and released for production by Indiana farmers in 1987. It has the Rps1-k allele for Phytophthora resistance. Harper combines good yield potential with excellent resistance to lodging. It is well adapted to production in the central two-thirds of Indiana.

Pella 86 was developed in Iowa in cooperation with the Ohio Agricultural Research and Development Center. It is a backcross derivative of the very popular variety Pella and has the Rps1-k allele for Phytophthora resistance, similar to Kenwood 94, Resnik, and Probst. It is well adapted to production in central Indiana.

Probst was developed by the USDA-Agricultural Research Service in cooperation with the Purdue University Agricultural Research Programs and released in 1994. It is a late maturity Group III variety that has excellent yield potential and excellent resistance to lodging. Since Probst has the Rps1-k allele for resistance to Phytophthora, it is resistant to six of the nine frequently occurring races of this pathogen in Indiana.

Resnik, a backcross derivative of the Asgrow variety A3127, was developed by the Ohio Agricultural Research and Development Center and released in 1987. This early Group III variety combines very good yield with excellent lodging resistance. Resnik has the Rps1-k allele for resistance to Phytophthora. It is well adapted to either row culture or solid seeding in central Indiana.

Thorne was developed by the Ohio Agricultural Research and Development Center and

released in 1993. Thorne is a mid-Group III variety that has very good yield potential and good resistance to lodging. Like most other Group III varieties, it has the Rps1-k allele for Phytophthora resistance. It is the only Group III variety that has moderately good resistance to brown stem rot. Thorne is well adapted to production in central Indiana.

Williams 82 is a Phytophthora-resistant version of the very popular variety Williams developed by the USDA-Agricultural Research Service and the Illinois Agricultural Experiment Station. Williams 82 has good yield potential and has the Rps1-k allele for Phytophthora resistance. This tall, late Group III variety has a large canopy and is well suited for row culture in the southern two-thirds of Indiana. It is less responsive to solid seeding than more compact, early maturing varieties, but is an excellent variety for double-cropping in the southern half of the state.

Yale was developed by the Illinois Agricultural Experiment Station and released in 1994. This variety has very good yield potential and is resistant to races 3, 4, and 14 of the soybean cyst nematode (SCN). Yale is the first SCN-resistant variety that has excellent resistance to lodging. Yale is adapted to production in central Indiana and is recommended for production on those soils where soybean cyst nematode infestations have stunted plants or reduced seed yields.

Maturity Group IV

Bronson was developed by the USDA-Agricultural Research Service in cooperation with the Purdue University Agricultural Research Programs and was released in 1993. It is a maturity Group IV variety that is resistant to races 3, 4, and 14 of the soybean cyst nematode (SCN). It is also resistant to very virulent strains of SCN that have been identified in Indiana. Bronson has very good yield potential but only fair resistance to lodging. Seedlings of Bronson have shown a resistant reaction to race 1 of Phytophthora, but the allele for resistance is unknown. This variety is adapted to production in the southern half of Indiana and is recom-

mended for production in those areas where SCN infestations have stunted plants or reduced seed yields.

Corsica is an early Group IV variety that was developed by the Maryland Agricultural Experiment Station and released in 1991. This variety matures three to four days earlier than the Group IV varieties Stressland and Spencer. It has excellent yield potential and excellent resistance to lodging. Corsica does not have any of the known major genes for Phytophthora resistance. It is well adapted to production in the southern half of the state.

Flyer was developed by the Ohio Agricultural Research and Development Center and was released in 1988. Flyer is a backcross derivative of the variety Asgrow A3127 that has the Rps1-k allele for Phytophthora resistance, similar to many Group III varieties. This variety combines good yield potential with excellent resistance to lodging. It is the earliest maturing of the Group IV varieties and is well adapted to production in the southern half of Indiana.

Spencer was developed by the USDA-Agricultural Research Service in cooperation with the Purdue University Agricultural Research Programs and was released in 1988. Spencer combines good yield potential with excellent resistance to lodging but has no major genes for resistance to Phytophthora rot. Spencer is well-adapted to production in the southern half of Indiana. This variety is susceptible to sudden

death syndrome (SDS) and is not recommended for planting on fields with a history of this disease.

Stressland was developed by the USDA-Agricultural Research Service in cooperation with the Ohio Agricultural Research and Development Center and released in 1994. It is a mid-Group IV variety that has good resistance to lodging. Stressland has excellent yield potential in environments that subject the variety to stress as well as in highly productive environments. This variety does not have major gene resistance to Phytophthora rot. It is well adapted to production in the southern half of Indiana.

Table 1. Descriptive characteristics of public soybean varieties in Indiana.

Variety	Growth habit	Flower	Pubesc.	Pod	Hilum	Phytophthora resistance
Group II varieties		----- color -----			allele ¹	
Archer*	Indeterminate	Purple	Gray	Tan	Imp. blk ²	Rps1-k, Rps6
Burlison*	Indeterminate	White	Tawny	Tan	Black	Rps1-b, Rps3
Chapman*	Indeterminate	Purple	Gray	Brown	Imp. blk.	Rps3
IA2008R	Indeterminate	White	Gray	Tan	Buff	Rps1-k
IA2022	Indeterminate	Purple	Gray	Brown	Imp. blk.	None
Kenwood 94	Indeterminate	Purple	Tawny	Brown	Black	Rps1-k
Group III varieties						
Charleston	Determinate	Purple	Tawny	Tan	Black	None
Edison*	Indeterminate	Purple	Tawny	Tan	Black	Rps1-k
Harper 87*	Indeterminate	Purple	Tawny	Brown	Black	Rps1-k
Pella 86*	Indeterminate	Purple	Tawny	Tan	Black	Rps1-k
Probst*	Indeterminate	Purple	Tawny	Tan	Black	Rps1-k
Resnik*	Indeterminate	Purple	Tawny	Tan	Black	Rps1-k
Thorne*	Indeterminate	White	Tawny	Brown	Black	Rps1-k
Williams 82	Indeterminate	White	Tawny	Tan	Black	Rps1-k
Yale	Indeterminate	White	Gray	Tan	Buff	None
Group IV varieties						
Bronson*	Indeterminate	White	Tawny	Tan	Black	Unknown
Corsica*	Indeterminate	Purple	Tawny	Tan	Black	None
Flyer*	Indeterminate	Purple	Tawny	Tan	Black	Rps1-k
Spencer*	Indeterminate	White	Tawny	Brown	Brown	None
Stressland	Indeterminate	Purple	Tawny	Tan	Black	None

¹ Rps1-b protects against races 1,3-9,13-15,18,21,22,34,36,37,40, and 42-45.

Rps1-k protects against races 1-11,13-15,17,18,21-24,26,36,37, and 42-44.

Rps3 protects against races 1-5,8,9,11,13,14,16,18,23,25,28,29,31-35,40,41, and 43-45.

Rps6 protects against races 1-4,10,12,14-16,18-21,25,28,33-40, and 41-44.

Phytophthora sojae races 1,3, 4, 7, 13, 25, 28, 33, and 44 are most frequently isolated from production fields in Indiana. Additional races have been found in the state but in low frequencies.

² Imperfect black.

* Varieties protected under the Plant Variety Protection Act.

Table 2. Performance of public soybean varieties in Indiana.

Variety	Yield bu/a	Mature date	Plant height inches	Lodging score ¹	Seeds per lb. no.	Seed quality score ²	Protein %	Oil %
Group II varieties at West Lafayette, 1994-1996. Average date planted, May 31.								
Archer	42.6	9-14	34	1.8	2954	1.2	42.6	20.5
Burlison	46.3	9-22	32	1.4	2873	1.0	44.8	19.2
IA2008R	46.5	9-17	35	1.8	3422	1.3	41.0	20.4
IA2022	54.4	9-21	36	1.5	3074	1.2	42.7	20.4
Chapman	46.0	9-20	32	1.3	2814	1.2	42.2	21.0
Kenwood 94	47.4	9-17	32	1.8	3258	1.2	42.2	20.4
LSD 0.10	5.3	4	2	0.3	170	0.2	1.4	0.9
Group III varieties at Bluffton, 1994-1996, West Lafayette, 1994-1996, Vincennes, 1994, and Butlerville, 1996. Average date planted, June 4.								
Charleston	42.1	9-30	24	1.0	3107	1.2	41.9	20.0
Edison	43.1	9-30	29	1.2	3278	1.1	41.0	20.2
Harper 87	43.0	10-1	33	1.4	2775	1.4	41.0	20.4
Pella 86	38.0	9-29	31	1.2	2901	1.3	41.6	20.3
Probst	43.6	9-29	30	1.3	3112	1.2	41.5	20.0
Resnik	42.0	9-28	29	1.3	3166	1.0	42.5	20.2
Thorne	45.0	9-28	28	1.2	2766	1.2	42.9	20.2
Williams 82	42.8	10-3	34	1.7	2934	1.2	41.8	20.3
Yale	45.3	10-2	32	1.2	3080	1.2	41.3	20.9
LSD 0.10	4.0	2	2	0.3	140	0.2	0.4	0.3
Group IV varieties at West Lafayette, 1994-1996, Vincennes, 1994, and Butlerville, 1996. Average date planted, June 5.								
Bronson	48.4	10-8	40	2.1	2750	1.1	40.8	20.0
Corsica	47.9	10-3	36	1.5	2740	1.2	41.9	20.2
Flyer	44.7	10-2	34	1.4	3170	1.2	41.6	20.6
Spencer	46.1	10-7	37	1.2	2478	1.4	41.0	21.1
Stressland	51.9	10-6	39	1.6	3180	1.3	42.0	20.6
LSD 0.10	6.8	4	3	0.4	250	0.4	1.5	0.6

¹ Lodging score is from 1 (all plants erect) to 5 (all plants lodged flat).

² Seed quality score is from 1 (very good) to 5 (very poor).

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This material may be available in alternative formats.

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