

**OHIO PERFORMANCE TRIALS
of
PUBLIC SOYBEAN VARIETIES**

*Including
1999 Results*

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Ohio Performance Trials of Public Soybean Varieties

This report is published annually to supplement the publication, "Ohio Soybean Performance Trials" (Horticulture and Crop Science Department Series 212), which presents information on the performance of both public and private soybean varieties in Ohio. The purpose of the present report is to provide further information on public varieties.

The data in this report were obtained from randomized, replicated plots that were end-trimmed before harvest to remove unbordered plants at the ends of rows. For more accurate comparisons, bordered plots were used in all tests, i.e., only the inner rows of plots were harvested to obtain yield estimates. There were three replications of each variety at each test location in 1999.

The environment affects varietal performance to a large degree. The use of multiple replications within a field reduces, but does not eliminate, the effect of micro-environmental differences within a field. All data reported in any field performance test are therefore subject to error. The Least Significant Difference [LSD (0.30)] can be used to make comparisons between the means of two varieties in the same test. The LSD (0.30) is calculated in such a way that, if two varieties are in reality equal genetically, their observed means are expected to differ due to random, micro-environmental variation by the amount of the LSD or greater in 30% of the tests. When the difference between two varietal means exceeds the LSD, it is likely that the difference has a genetic basis. The notation "ns", when it appears instead of a numerical LSD value, means that there were no significant differences among any varieties at the 30% probability level.

The best variety in a particular test may not be the best in all environments. Repeating the trials at different locations and in multiple growing seasons provides more precise estimates of the true genetic differences between varieties. Therefore, **the most reliable comparisons are those based on average performance across multiple years, multiple locations, or both.** Some of the tables in this publication display average yields from several different combinations of years. In these tables, the only valid comparisons are those within a single column.

A summary of 1999 test sites follows:

Location	County	Soil Series	Row Spacing
Hoytville	Wood	Hoytville	7½" (variety and semidwarf test) 15" (food-grade test)
Lakeview	Auglaize	Milford	15"
Mt. Orab	Brown	Clermont	15"
Plain City	Union	Brookston (Kokomo)	15"
So. Charleston	Clark	Brookston (Kokomo)	15" (variety and food-grade tests) 7½" (semidwarf test)
Wooster	Wayne	Wooster	7½"

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Characteristics of Varieties; New Varieties

Table 1 summarizes characteristics of the public varieties tested in 1999. Most of these varieties are available only as a class of certified seed. Certified seed of new varieties generally becomes available in limited quantities two years after the year of release. Thus, certified seed of 1997 and 1998 releases should be available for 2000 planting, although supplies of the latter will be limited.

Apollo was developed by the Michigan Agricultural Experiment Station. A tall group II variety, it has excellent lodging resistance.

Croton 3.9 is a late-group III variety developed by USDA and OARDC. It is particularly adapted to stress environments.

Darby is a mid-group III variety developed by OARDC. It is similar in maturity and plant type to the older variety Resnik but has increased yield.

Dwight is a group II release from the Illinois Agricultural Research Station. It is resistant to soybean cyst nematode.

HS93-4118 is a group IV strain developed by OARDC. Available only on a branded basis, it is particularly adapted to productive soils in Southern Ohio.

Tiffin is a group II variety developed by OARDC. It has improved resistance to Phytophthora rot, specifically, with two genes, Rps1c and Rps3a.

Troll is an early group IV semidwarf variety developed by USDA and OARDC.

The new 1999 releases, Kottman, Stout, and Sturdie, will not be available to producers in 2000.

Results of Performance Trials

The 1999 growing season was hot and dry. All test sites experienced significant drought stress at times. Brown stem rot was present at Lakeview, Plain City, and Mt. Orab. None of the varieties in this year's tests was resistant to brown stem rot. Symptoms of Phytophthora rot did not appear on entries in the tests reported herein, and resistance or susceptibility to this disease did not appear to translate into a yield difference. The drought limited vegetative growth, which resulted in minimal lodging in most tests.

Results for maturity group II and early group III varieties for 1999 are shown in Table 2 (Ohio Advanced Line Test A). Significant shattering occurred before harvest on some early varieties at Plain City and Lakeview. This reduced yields of those varieties. Because yield tests cannot be harvested until the latest entry is mature, shattering of early entries in test plots is more severe than any shattering encountered by producers of these varieties who harvest their fields promptly. Vertex was the earliest entry in the 1999 trials and yielded less than later varieties. Other than Tiffin, which suffered shattering losses at Plain City, the remaining varieties had

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mean yields ranging from 50.0 to 53.5 bu/a. The private check, W272, had very good yields at South Charleston and Plain City, and, along with the other private check, 9306, was among the best yielding entries at Lakeview. Flint, Darby, and Sandusky yielded well at Hoytville, and Defiance outyielded all other varieties at Wooster, with 60.4 bu/a.

Table 3 summarizes data from ALT A for the past five years. The 1998-99 data reveal that Apollo and Defiance are taller than the other varieties in the test. With up to five years of data at each site, it is possible to see where the varieties are best adapted. At South Charleston, where the soil type (Brookston) is dark and productive, Darby and Flint have yielded well for five years, as has Apollo in its three test years. On the same soil type at Plain City, Defiance and Apollo had the best three-year means, with Flint and Darby close behind Apollo. Apollo has also performed well on the lighter-colored lake-bed soil at Lakeview. Vertex and Sandusky have yielded consistently poorly at Lakeview. At Hoytville, Flint has been the leader, with Darby close behind. Finally, at Wooster, Defiance and Darby were the best, with Tiffin leading the early entries.

Overall, it appears that Flint, Apollo, and Darby are widely adapted to different soils, where Sandusky prefers dark soils. Defiance seems best adapted to lighter colored soils. Because of its susceptibility to lodging and two-gene resistance to Phytophthora, Tiffin should be used where Phytophthora is expected to be a problem. In the two-year mean of all locations, the best yielding varieties were Defiance, 9306 (the private check), and Apollo.

Table 4 summarizes the 1999 results of the test of late-maturing entries (Ohio Advanced Line Test B). Tiffin was included as a group II check, but all other entries ranged from mid-group III to early group IV. This year, the best-yielding entry overall was 93B82, a private check, which had an extremely high yield at South Charleston (74.9 bu/a) and was also the best entry at Lakeview. At Mt. Orab, the southernmost test site, the best yielding entries were Troll and HS93-4118. Yields at Hoytville were variable due to uneven environmental conditions and were not included in the overall mean. Early entries seemed to be favored at this site. The best entries at Wooster were the new semidwarf varieties Stout and Sturdie, along with 93B34. Overall, the highest yields, apart from 93B82, were attained by the group IV entries, and several mid- and late-group III varieties had yields clustered in the range of 53 to 55 bu/a.

The past four years of results from the late test are summarized in Table 5. At Mt. Orab, the best entries have been Troll, HS93-4118, and General. The South Charleston location has been dominated by HS93-4118, which has averaged more than 70 bu/a there for the last four years. At Lakeview, HS93-4118 and Kottman yielded best, and Kottman was the leader at Wooster. Croton 3.9 was released because of its specialized adaptation to poor sites; comparison with General suggests Croton 3.9 is superior on light-colored soils at Lakeview and Wooster, while General outyielded Croton 3.9 at Mt. Orab and South Charleston.

Overall, Kottman and General had very similar yields during 1996-99. Kottman is earlier than General and carries two genes (*Rps1k* and *Rps3a*) for Phytophthora resistance, while General has only one gene. Both General and Kottman have outyielded the earlier entries Darby and Defiance. Tiffin, the group II entry, yielded about the same as Darby in 1998-99.

Food-grade varieties and public checks were compared at four locations in 1999, with the expansion of this test to include the Wooster site (Table 6). The test at Wooster encountered severe drought, resulting in low yields. Overall, the late commodity-type checks, HS93-4118,

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Kottman, and General, had the highest yields (46.5 to 49.0 bu/a), with most of the remaining entries clustered between 38 and 42 bu/a. The three Iowa food-grade entries (IA 2041, IA 3006, and IA 3011) matured earlier than Ohio FG1 but yielded less. Vinton 81 was the poorest yielding variety in the test. Food-grade types yielded less than the commodity varieties at all sites, except at Wooster, where Ohio FG1 was one of the best entries.

Table 7 summarizes the food-grade test in 1996-99. Ohio FG2 had slightly larger seed than Ohio FG1, but both Ohio food-grade lines exceeded Vinton 81 in seed size. The mean yield advantage of Ohio FG1 over Vinton 81 was 5.4 bu/a, and the advantage of General over Ohio FG1 was 4.3 bu/a.

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Semidwarf Varieties

by R. L. Cooper

Semidwarf soybean varieties were developed in response to the lodging barrier to higher soybean yields that was identified in then late 1970's. Most breeders selected for shorter indeterminate varieties to increase lodging resistance. Semidwarf varieties differ from the traditional indeterminate varieties grown in the northern U.S. by their determinate plant type. Once the terminal raceme of flowers is produced, the plants will get no taller. This is an asset in high yield environments where indeterminate varieties may get too tall, resulting in lodging problems. On the other hand, this characteristic may be a disadvantage in low yielding environments where the plants may not get tall enough for efficient harvest. Thus semidwarf varieties are recommended only on land that has a history of high yield (50 bu/a or more).

Because of their smaller more efficient plant type, semidwarf varieties are more responsive to solid-seeding and higher seeding rates than indeterminate varieties. To obtain maximum yield, semidwarf varieties should be solid-seeded in 7- to 10-inch row spacing at a seeding rate of 4 seeds/ft of row (300,000 seeds/a of 90%+ germ).

The specific management practices recommended for semidwarf varieties has created difficulties in obtaining valid yield comparisons of semidwarf and indeterminate varieties. Many yield trials are still conducted in 30-inch rows with a seeding rate of 225,000 seeds/a, and in some cases no border rows. These trials do not demonstrate the full yield potential of semidwarf varieties, and in absence of border rows, the shorter semidwarf varieties are shaded by the adjacent, taller indeterminate varieties, reducing their yield potential. Thus in judging the yield potential of semidwarf varieties, compared to taller indeterminate varieties, care should be taken to determine if the data are from a properly conducted yield trial (e.g narrow rows, higher seeding rate for semidwarfs and adequate border rows).

One of the barriers to grower acceptance of semidwarf varieties is the positive association with plant height and yield in indeterminate varieties (i.e. the taller the plants the higher the yields). Thus growers associate shorter plant height with poorer yield. The reason growers tend to underestimate the yield of semidwarf varieties is that semidwarf varieties have a much higher harvest index (the percent of the mature plant weight due to seed) than most indeterminate varieties (50%+ for semidwarf varieties vs 45% or less for many indeterminate varieties). The increasing use of yield monitors on grower combines should help overcome this problem.

The first semidwarf variety, Elf, was released in 1977. Ten subsequent releases were made between 1978 and 1981, with the most popular varieties, Sprite and Sprite 87 in Ohio and Hobbit and Hobbit 87 in the cornbelt states west of Ohio. Also a maturity group IV variety, Ripley, gained good acceptance in southern part of the cornbelt states. In 1982, a new, higher yielding, group III semidwarf variety, Charleston, was released, largely replacing Sprite 87 in Ohio and Hobbit 87 in other cornbelt states. In 1998, a new, higher yielding semidwarf variety, Toll was released as a replacement for Ripley.

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In a non-irrigated preliminary yield trial at Wooster, OH in 1995, 8 semidwarf breeding lines from the same cross, Sprite 87 x HC85-6577, exceeded 80 bu/a with 3 lines exceeding 90 bu/a, suggesting this was an outstanding cross. The first releases from this cross were made in 1999, Stout, a maturity group III semidwarf variety and Sturdie, a maturity group IV semidwarf variety. It is anticipated these two varieties will have a major impact on grower acceptance of semidwarf varieties.

Newest Semidwarf Releases

Charleston

Charleston is a mid-group III variety that was released in 1982 and, because of its higher yield potential, has largely replaced Sprite 87, except where Phytophthora root rot is a serious problem. Charleston has moderate tolerance to Phytophthora but does not carry major gene resistance to this disease. Sprite 87 carries the Rps1k gene. Charleston continues to yield well and at S. Charleston has consistently yielded near the top of the entries. It topped the yield trial in 1999 at 88.8 bu/a (table 9). In subirrigation/drainage trials in NW Ohio, both at the NW Branch and at grower demonstration sites, Charleston has shown to be very yield responsive to favorable moisture conditions (e.g. 79 vs 49 bu/a at the NW Branch and 70 vs 47 at a grower demonstration site near Delta, OH).

Troll

Troll is a new mid-group IV variety released in 1998 as a replacement for the semidwarf variety, Ripley. In the Uniform Regional Trials, Troll has averaged 5 bu/a more than Ripley and 2 days earlier in maturity. In 1998, Troll yielded 13 bu/a more than Ripley at S. Charleston and equaled the yield of Stressland. In 1999, Troll ranked 3rd in yield at S. Charleston with 82.4 bu/a (table 9). Troll carries the Rps1k gene for Phytophthora resistance.

Stout

Stout is a new maturity group III semidwarf variety released in 1999 which has shown exceptional yielding ability. Averaged over 4 years in high yield environments at Wooster, OH, Stout yielded 86.8 bu/a compared to 76.5 bu/a for Charleston. In 1999, under a sprinkler irrigation system at Wooster, OH, Stout was the highest yielding entry with 96.6 bu/a compared to 83.3 bu/a for Charleston. Under a subirrigation/drainage system, Stout produced 97.2 bu/a. Stout carries the Rps1a gene for resistance to Phytophthora root rot. Foundation seed of Stout was produced in 1999 by Ohio Foundation Seeds, Inc., providing a limited supply of seed for distribution in 2000.

Sturdie

Sturdie is a new maturity group IV semidwarf line from the same cross and F2-derived line as Stout. It also has shown exceptional yielding ability and is recommended for southern Ohio where maturity group IV varieties are best adapted. In the high yield environments at Wooster,

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averaged over 4 years, Sturdie yielded 84.4 bu/a compared to 76.5 bu/a for Charleston. In 1999, under sprinkler irrigation at Wooster, Sturdie produced 78.0 bu/a and under subirrigation/drainage, 92.4 bu/a. In 1998, Sturdie outyielded Stout in the Wooster irrigated trial (88.9 vs 86.8 bu/a). Sturdie also carries the Rps1a gene for Phytophthora resistance. Limited foundation seed of Sturdie will be available for distribution in 2000.

1999 Data

Hoytville

Yields were down in 1999 due to low rainfall. Also, persistent Mn deficiency symptoms (leaf chlorosis) was evident in some varieties over the entire growing season, which may have contributed to the lower yield of these cultivars (e.g .Charleston, etc.). Most years symptoms of Mn deficiency are temporary and disappears after a rainfall event but this did not happen in 1999.

Sandusky and General produced the highest yield, followed by Croton 3.9 and the new cultivar, Kottman (table 8). The next highest in yield were Flint and Defiance, followed closely by the new semidwarf variety, Stout, and Tiffin. Lowest in yield were Charleston, which showed severe Mn deficiency symptoms, and Darby.

Averaged over 2 years, the group II cultivars, Sandusky and Flint were highest in yield, followed closely by General. Darby, Croton 3.9 and Tiffin were the next highest in yield. Defiance and Charleston were the lowest in yield.

S. Charleston

Rainfall was adequate and timely, resulting in excellent yields on the Kokomo silt loam soils at this location. These soils have excellent water holding capacity which is a major factor contributing to the higher yields we normally obtain at this location.

The semidwarf variety, Charleston was highest in yield with 88.8 bu/a , followed by HS93-4118 with 84.3 bu/a and the new semidwarf variety, Troll, with 82.4 bu/a. The next highest in yield was the new variety, Kottman, with 78.0 bu/a, followed closely by the new semidwarf variety, Stout, Croton 3.9 and Darby, all of which yielded 76.5 bu/a. The next highest in yield was Sandusky at 76.3 bu/a, followed by the new group IV semidwarf variety, Sturdie at 73.8 bu/a. Flint and Stressland were the lowest in yield with Tiffin and General intermediate in yield.

Averaged over 2 years, HS93-4118 was the highest in yield with 83.1 bu/a, followed by Charleston with 79.2 bu/a, Croton 3.9 with 72.8 bu/a, Darby with 71.6 bu/a, General with 71.4 bu/a, and Sandusky with 70.1 bu/a. General averaged 66.6 bu/a followed closely by Tiffin with 66.1 bu/a. Lowest in yield were Flint with 64.1 bu/a, Stressland with 62.6 bu/a and Defiance with 60.5 bu/a.

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Summary

The high yields of Charleston and Troll at S Charleston demonstrate the competitiveness of semidwarf varieties when evaluated in a properly conducted varietal yield trial (i.e. narrow rows, the recommended higher seeding rate for semidwarf varieties, and adequate border rows). The lower yields at Hoytville, including the semidwarf varieties, are attributed to the drought effects and the season long Mn deficiency. The potential yield advantage of semidwarf varieties are masked in such environments. Based on their past performance, the new semidwarf varieties, Stout and Sturdie, did not perform as well as anticipated. Multi-year data are needed at both locations to more fully evaluate the yield potential of these new cultivars in these environments.

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Table 1. Characteristics of publicly developed varieties in 1999 trials.

Variety	Origin	Yr released	Maturity	Pedigree	Resistance ^a
Vertex	Ohio	1993	2.4	Conrad x Hayes	Rps1k
Conrad 94	Iowa	1994	2.5	(Conrad ⁵⁷ x Elgin 87) x (Conrad ⁵⁷ x Preston BC)	Rps1k,Rps6
Vinton 81	Iowa	1981	2.5	L60-347-4-4G-2-B x Vinton ⁵	Rps1c
IA 2041	Iowa		2.5		
Tiffin	Ohio	1998	2.7	Haroson x Chapman	Rps1c,Rps3a
Apollo	Michigan	1997	2.8	S23-12 x Elgin 87	Rps1k
Sandusky	Ohio	1993	2.8	Conrad x Hayes	Rps1k
Flint	Ohio	1996	2.8	GR 8836 x Elgin 87	Rps1k
Dwight	Illinois	1997	2.8	Jack x A86-303014	SCN
IA 3006	Iowa		3.0		
IA 3011	Iowa		3.0		
Defiance	Ohio	1996	3.3	HM8778 x A3733	Rps3a
Ohio FG1	Ohio	1994	3.4	LS301 x HS84-6247	Rps3a
Ohio FG2	Ohio	1994	3.4	LS301 x HS84-6247	Rps3a
Darby	Ohio	1998	3.4	GR8936 x Edison	Rps1k
Stout ^{b c}	Ohio	1999	3.5	Sprite 87 x HC85-6577	Rps1a
Charleston ^c	Ohio	1992	3.6	HC74-634RD x HC78-676	
Kottman ^b	Ohio	1999	3.7	HS88-7363 x HS88-4988	Rps1k,Rps3a
General	Ohio	1995	3.9	Voris 311 x Resnik	Rps1k
Croton 3.9	Ohio	1997	3.9	HC80-1944 x A3127	
Sturdie ^{b c}	Ohio	1999	4.1	Sprite 87 x HC85-6577	Rps1a
Troll ^c	Ohio	1998	4.1	Sprite 87 x HC80-1756	Rps1k
HS93-4118 ^d	Ohio	1998	4.2	IA 2007 x DSR 304	Rps1c
Ripley ^c	Ohio	1985	4.3	Hodgson x V68-1034	Rps root gene
Stressland	Ohio	1994	4.3	HC80-1946 x A3127	

^aRps genes confer resistance to phytophthora rot; SCN=resistant to soybean cyst nematode.

^bprior designations of new releases: Kottman = HS94-4544; Stout = HC94-421; Sturdie = HC94-422.

^csemidwarf variety

^dreleased for branding.

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Table 2. Summary of 1999 trials of early-maturing varieties (Ohio Advanced Line Test A).

Entry	Maturity	Lodging score ^a	Height (in)	Yield (bu/a)					Mean
				S.Char.	Plain C.	Lakeview	Hoytville	Wooster	
Vertex	9/ 1	1.1	29	51.6	31.6 ^b	40.0 ^b	48.6	41.9	42.7
Sandusky	9/ 6	1.1	31	54.9	45.7	52.8	52.8	44.0	50.0
Tiffin	9/ 7	1.3	32	48.8	34.8 ^b	48.1	48.4	51.3	46.3
Flint	9/ 8	1.2	30	59.0	46.0	51.3	54.8	52.5	52.7
Apollo	9/10	1.2	35	62.7	46.3	53.3	45.0	51.4	51.7
Dwight	9/10	1.1	28	62.6	45.2	46.6	46.7	51.8	50.6
W272 ^c	9/11	1.1	30	66.9	53.8	56.6	42.0	42.3	52.3
9306 ^c	9/12	1.1	32	54.5	50.5	57.3	52.4	52.7	53.5
Defiance	9/14	1.1	35	50.2	52.4	49.6	49.5	60.4	52.4
Darby	9/14	1.1	32	56.1	44.8	47.4	53.5	52.3	50.8
LSD (0.30)	1	0.1	1	4.9	3.6	3.5	2.8	4.9	2.9

^arated from 1 (erect) to 5 (prostrate).

^byield reduced by shattering before harvest.

^cPrivate checks from Wellman Seeds (W 272) and Pioneer (9306).

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Table 3. Multi-year summary for early-maturing varieties, 1995-99.

Entry	1998-99			Yield (bu/a)																
	mat.	lodg.	ht.	S. Charleston			Lakeview			Hoytville		Wooster			Plain City		All locations			
	date	score ^a	in.	98-99	97-99	95-99	98-99	97-99	95-99	97,99	95-97,9	98-99	97-99	95-99	98-99	97-99	98-99	97-99	95-99	
Vertex	9/4	1.4	31	57.7	57.8	54.2	43.0	44.2	39.7	49.2	40.2	47.3	39.9	36.4	42.5	45.9	47.7	47.3	43.2	
Flint	9/9	1.4	31	62.1	63.7	62.5	53.7	54.2	47.3	55.2	50.2	48.9	42.0	44.3	52.5	55.6	54.3	54.1	51.7	
Tiffin	9/10	1.9	33	56.0	59.4	58.4	53.0	55.3	54.9	52.3	47.4	49.4	44.6	45.8	47.5	51.4	51.1	52.6	51.8	
Sandusky	9/10	1.4	33	62.0	62.8	59.4	48.4	51.7	43.2	53.1	47.1	46.6	41.1	40.8	52.7	54.2	52.5	52.5	48.5	
Apollo	9/10	1.4	35	66.8	69.0	--	59.9	61.1	--	50.0	--	51.2	43.9	--	53.8	56.0	56.4	56.4	--	
9306 ^b	9/13	1.3	32	65.4	--	--	59.3	--	--	--	--	50.4	--	--	53.3	--	56.5	--	--	
Defiance	9/15	1.4	35	57.5	59.5	58.2	56.7	58.7	54.2	51.1	47.1	55.2	48.2	47.9	60.1	59.9	56.5	55.8	53.2	
Darby	9/16	1.4	33	61.0	66.7	63.6	52.1	58.3	54.1	54.7	49.6	51.3	43.6	47.8	53.3	55.5	54.3	55.9	54.2	

^arated from 1 (erect) to 5 (prostrate).

^bPioneer variety included as check.

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Table 4. Summary of 1999 trials of late-maturing entries (Ohio Advanced Line Test B).

Entry	Maturity	Lodging score ^a	Height (in)	Yield (bu/a)					Mean ^b
				Mt. Orab	S. Char.	Lakeview	Hoytville	Wooster	
Tiffin	9/ 4	1.3	32	39.9	60.9	45.1	47.2	40.2	46.5
GR9730 ^c	9/ 9	1.1	33	45.2	59.1	51.8	52.0	45.7	50.5
A3002 ^c	9/10	1.2	31	46.9	58.7	52.1	48.3	53.6	52.8
AG3302 ^c	9/11	1.1	33	51.6	57.8	51.0	44.2	51.9	53.1
93B34 ^c	9/11	1.1	30	52.5	57.0	52.6	43.4	54.4	54.1
Darby	9/11	1.1	30	51.3	56.4	49.5	46.9	44.6	50.5
Defiance	9/12	1.1	34	50.0	63.2	49.5	43.4	54.7	54.4
Stout	9/12	1.1	24	46.6	59.1	55.8	44.9	56.1	54.4
93B82 ^c	9/14	1.1	33	57.5	74.9	57.0	44.8	48.5	59.5
Kottman	9/15	1.1	31	50.8	58.4	54.3	46.2	53.2	54.2
Croton 3.9	9/15	1.2	37	55.1	61.8	49.4	41.8	50.2	54.1
General	9/16	1.1	31	51.8	63.5	48.2	33.1	49.3	53.2
HS93-4118	9/19	1.1	32	50.2	69.2	54.2	27.6	53.3	56.7
Sturdie	9/20	1.1	25	59.0	62.9	53.0	42.2	55.5	57.6
Troll	9/21	1.1	25	61.6	59.1	51.5	28.2	50.2	55.6
LSD (0.30)	1	0.1	1	3.8	5.6	3.3	6.5	4.3	3.2

^arated from 1 (erect) to 5 (prostrate).

^bHoytville excluded due to large experimental error.

^cPrivate checks from AGRA (GR9730), Monsanto (A3002 and AG3302), and Pioneer (93B34 and 93B82).

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Table 5. Multi-year summary for late-maturing varieties, 1996-99.

Entry	1998-99			Yield (bu/a)											
	mat.	lodg.	ht.	Mt. Orab		S. Charleston		Lakeview		Hoyt-ville	Wooster		All locations		
	date	score ^a	in.	98-99	96-99	98-99	96-99	98-99	96-99	96-98	98-99	96-99	98-99	97-99	96-99
Tiffin	9/ 6	1.9	33	51.8	--	60.2	--	58.6	--	--	44.2	--	55.5	--	--
GR9730 ^b	9/10	1.3	34	49.4	--	63.0	--	59.9	--	--	47.5	--	56.8	56.3	--
Defiance	9/11	1.5	34	54.3	52.1	63.2	61.1	57.1	56.6	52.6	51.5	52.0	58.4	56.4	55.0
Darby	9/11	1.3	31	54.6	--	58.6	--	56.9	--	--	47.1	--	55.6	--	--
Kottman	9/15	1.3	32	54.3	52.6	60.7	63.3	61.2	65.3	54.4	53.8	53.3	59.8	58.9	57.9
General	9/16	1.4	32	57.8	58.3	65.7	63.2	54.6	60.3	57.3	50.3	50.6	58.8	58.7	58.0
Croton 3.9	9/17	1.5	36	55.5	--	63.9	--	56.0	--	--	51.9	--	57.7	--	--
HS93-4118	9/19	1.5	34	57.4	--	71.1	71.7	61.1	65.7	54.7	54.3	52.2	62.7	--	--
Troll	9/20	1.3	25	58.2	--	60.5	--	54.1	--	--	52.4	--	57.9	--	--

^arated from 1 (erect) to 5 (prostrate).

^bAGRA variety included as check.

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Table 6. Summary of 1999 test of food-grade varieties and checks.

Entry	Maturity date	Lodging score ^a	Height in	Seed wt. g/100 ^b	Yield (bu/a)				
					S. Char.	Lakevie	Hoytville w	Wooster	Mean
Conrad 94	9/ 3	1.1	26	14.8	48.4	45.9	43.1	26.2	40.9
Vinton 81	9/ 5	1.2	30	19.7	45.7	37.6	37.9	23.6	36.2
IA 2041	9/ 5	1.1	27	17.1	42.5	42.6	40.6	24.1	37.5
IA 3011	9/ 8	1.1	27	19.9	50.9	39.7	41.8	25.2	39.4
Tiffin	9/ 8	1.2	29	15.3	46.8	44.0	37.4	34.6	40.7
IA 3006	9/ 9	1.1	27	21.8	45.2	40.3	38.0	28.9	38.1
Ohio FG2	9/13	1.2	32	21.8	46.4	39.8	38.0	28.7	38.2
Defiance	9/14	1.1	32	17.9	46.7	47.7	34.2	38.6	41.8
Ohio FG1	9/16	1.2	31	21.2	43.3	44.5	36.2	36.2	40.1
Kottman	9/18	1.1	32	15.7	58.6	56.1	44.3	36.8	49.0
General	9/18	1.1	32	15.9	60.4	52.9	42.4	36.6	48.1
HS93-4118	9/20	1.1	30	15.2	60.2	54.5	38.6	32.7	46.5
LSD(0.30)	1	0.1	1	0.7	3.2	3.5	3.4	2.8	2.8

^arated from 1 (erect) to 5 (prostrate).

^bgrams per 100 seeds; to convert to seeds/lb, divide 45360 by figure given (for example, 21.2 g/100 seeds equals 2140 seeds/lb).

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Table 7. Multiple-year summary for test of food-grade varieties and checks, 1996-99^a.

Entry	maturity	lodging	seed	Yield	
	(date)	(score) ^b	weight	(bu/a)	
	1998-9	1998-9	(g/100) ^c	1998-9	1996-9
Conrad 94	9/ 7	1.2	15.4	45.4	47.2
Vinton 81	9/ 9	1.6	20.9	42.0	44.4
Tiffin	9/12	1.8	15.4	47.8	--
Ohio FG2	9/17	1.5	23.1	45.5	48.0
Defiance	9/17	1.3	18.5	49.4	51.5
Ohio FG1	9/19	1.3	22.3	44.7	49.8
Kottman	9/20	1.2	16.3	54.2	--
General	9/21	1.3	16.5	51.4	54.1
HS93-4118	9/24	1.3	15.6	53.9	--

^aincludes South Charleston and Hoytville, 1996-99, Lakeview, 1997-99, and Wooster, 1999.

^brated from 1 (erect) to 5 (prostrate).

^cgrams per 100 seeds; to convert to seeds/lb, divide 45360 by figure given (for example, 22.3 g/100 seeds equals 2034 seeds/lb).

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Table 8. Yield comparison of semidwarf and indeterminate varieties planted in 7 ½-inch rows at Hoytville, OH 1998-99¹.

Variety ²	1999			Yield	
	Maturity (date)	Height (in.)	Lodging (score) ³	1999 (bu/A)	1998-99
GROUP II					
Flint	9/17	31	1.5	54.3	65.1
Tiffin	9/17	32	2.0	52.6	59.3
Sandusky	9/19	37	1.5	60.7	65.4
GROUP III					
Defiance	9/23	35	1.0	53.3	58.7
Darby	9/23	36	1.5	48.3	61.4
Kottman	9/24	30	1.0	57.0	---
Stout*	9/24	22	1.0	52.9	---
Charleston*	9/26	24	1.0	50.5	56.4
Croton 3.9	9/28	39	2.0	57.1	59.4
General	9/28	33	1.0	60.5	63.0

¹ Due to the low rainfall, some varieties showed persistent Mn deficiency symptoms (leaf chlorosis) throughout the entire a growing season. This may have contributed to the lower yields of these varieties (e.g. Charleston, etc.).

² Semidwarf varieties (*) planted at 4 seeds/ft of row (300,000 seeds/A of 90% + germ or 270,000 viable seeds/A. Indeterminate varieties were planted at 3 seeds/ft of row (225,000 seeds/A of 90% + germ or 202,000 viable seeds/A).

³ 1 = erect to 5 = prostrate

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Table 9. Yield comparison of semidwarf and indeterminate varieties planted in 7 ½-inch rows at South Charleston, OH 1998-99.

Variety ¹	1999			Yield	
	Maturity (date)	Height (in.)	Lodging (score) ²	1999 (bu/A)	1998-99
GROUP II					
Flint	9/6	31	2.0	63.1	64.1
Sandusky	9/7	33	1.5	76.3	70.1
Tiffin	9/10	34	2.0	68.8	66.1
GROUP III					
Defiance	9/13	34	1.0	61.3	60.5
Darby	9/16	34	1.5	76.5	71.9
Kottman	9/18	34	1.0	78.0	---
Stout*	9/18	24	1.5	76.5	---
Charleston*	9/20	27	2.0	88.8	79.2
Croton 3.9	9/21	39	1.5	76.5	72.8
General	9/21	32	1.0	66.5	66.6
GROUP IV					
Sturdie*	9/26	26	1.3	73.8	---
HS93-4118	9/27	33	1.3	84.3	83.1
Troll*	9/28	26	1.0	82.4	71.4
Stressland	10/2	36	2.0	63.9	62.6

¹ Semidwarf varieties (*) planted at 4 seeds/ft of row (300,000 seeds/A of 90% + germ or 270,000 viable seeds/A. Indeterminate varieties were planted at 3 seeds/ft of row (225,000 seeds/A of 90% + germ or 202,000 viable seeds/A).

² 1 = erect to 5 = prostrate

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Locations of Public Soybean Variety Trials in Ohio



1. Private Test Site, Lakeview
2. Northwestern Branch Station, Hoytville
3. Agronomy Farm, Marysville
4. Private Test Site, Mt. Orab
5. Western Branch Station, South Charleston
6. Wooster Campus
7. Columbus Campus

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