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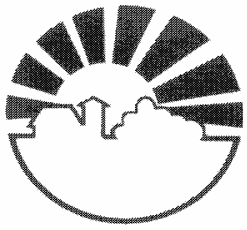
PERFORMANCE OF PUBLIC AND PRIVATE SMALL GRAINS IN INDIANA, 2005



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Performance of Public and Private Small Grains in Indiana, 2005

INTRODUCTION

Winter wheat and spring oats (small grains) are evaluated annually at several locations in Indiana. These trials are conducted according to the policies and procedures of Indiana Agricultural Research Programs at Purdue University. In this bulletin, results of the 2005 small grain performance trials are presented for those entries which are believed to be available to producers for seeding. Data for experimental entries are not included.

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http://www.agry.purdue.edu/pcpp/smgrains.html

Bulletin copies may be available, in Indiana, from local county Agricultural Extension Offices.

Performance results for both private and public entries are presented. Certified seed was used for seeding most of the public varieties. Private entries, entered voluntarily by the owner, were accepted in the trial after meeting the requirements for eligibility and payment of a testing fee. No verification has been made that the seed or the quality of the seed entered in this trial is the same as that offered for sale to the public.

Plans and rules for entering this trial are available, upon request, to anyone at any time. Persons wishing to enter the small grain performance trial should contact the author by August 1 for winter wheat and by February 1 for spring oats.

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PERFORMANCE TRIAL METHODOLOGY

This section contains information on locations and procedures used in conducting the trials.

Trial Locations

In 2005, trials were conducted at five locations for winter wheat and two locations for spring oats (see Figure 1, page 4). The locations, numbered from north to south, are:

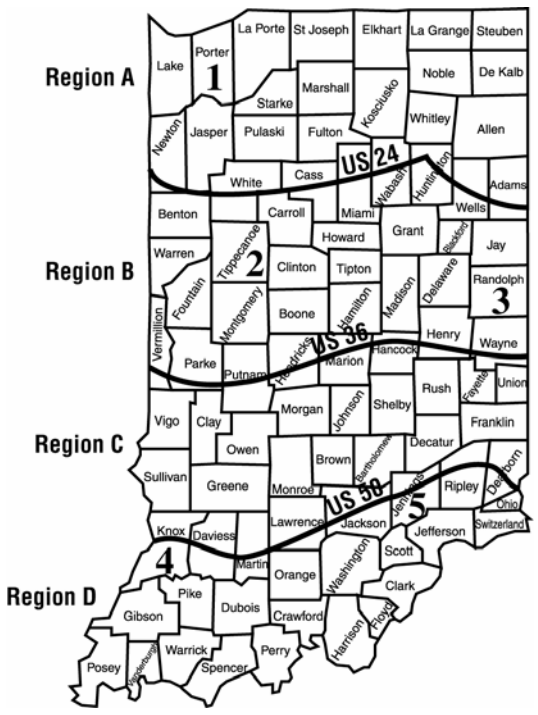
Location 1. Porter County at the Pinney Purdue Agricultural Center near Wanatah, on Runnymede loam, a dark gray depressional soil under laid by sandy substrata.

Location 2. Tippecanoe County, near Lafayette, at the Purdue University Agronomy Center for Research and Education (ACRE), on Drummer (Chalmers) silty clay loam, a very dark gray or black, poorly drained depressional soil.

Location 3. Randolph County at the Davis Purdue Agricultural Center near Farmland, on Blount silty clay loam, a dark grayish-brown, somewhat poorly drained soil.

Location 4. Knox Co., at the Southwest Purdue Agricultural Center near Vincennes on Ade loamy fine sand, a very dark gray, gently sloping somewhat excessively drained soil. Ade soil has low available water capacity and rapid permeability. Organic matter is relatively high and surface runoff is slow.

Location 5. Jennings Co., at the Southeast Purdue Agricultural Center near Butlerville, on Avonburg silt loam, a light grayish, nearly level, somewhat poorly drained soil, with fragipan in the sub-soil.



Hessian fly-free dates in Indiana:

Region A, Sept. 22 (north) to Sept. 26 (south)
Region B, Sept. 26 (north) to Oct. 1 (south)
Region C, Oct. 1 (north) to Oct. 6 (south)
Region D, Oct. 6 (north) to Oct. 9 (south)

Figure 1. Trial locations and Hessian fly-free dates.

Methods Used in the Trials

Seedbeds were prepared using conventional farm equipment. A randomized complete block design, with 4 blocks, was used in all trials. The wheat plots were planted in drill strips 35 feet long and 75 inches wide, and the oat plot drill strips were 75 feet long and 70 inches wide. All plots were end trimmed at harvest to approximately 20 feet in length for wheat and 16 feet for oats, and all rows were harvested. Plot width of 75 inches for wheat and 70 inches for oats was used for calculating harvest area for yield.

The plots were harvested with an Almaco plot combine, and were weighed and moisture tested automatically, on the combine, using a Seed Spector II and a Psion Workabout (computer). The Almaco plot weight and moisture equipment was calibrated using a Chantillon scales and a Motomco moisture meter, and the calibrations were checked throughout the harvest season.

It should be pointed out that the electronic weighing and moisture testing equipment, on the Almaco plot harvester, are not the same as equipment used to meet official grain grading standards, but are believed to be suitable for field plot work.

Grain yields from the test plots are reported as estimates of bushels per acre, adjusted to 14 percent moisture content.

Test weights were performed after harvest, in the Vartest building, using standard test weight equipment.

Lodging is expressed in percent from 0 to 100. Plots with a score of 0 to 25 percent are generally harvestable with conventional equipment, from either direction, and at optimum speed. Plots with a lodging score of 25 to 50 percent are harvestable, but may require reduced speed. As lodging percentages exceed 50 percent, harvesting problems escalate quickly and beyond 75 percent some grain may be lost, or damaged by contact with the soil.

Plant height, taken at harvest, was from the center of the plot and was measured to the nearest inch from the soil surface to the top of the head.

Winter killing data, at all locations, are generally taken when the plants were beginning spring growth. The data are based on visual observation and not on actual stand count, and are

influenced by differences in plant vigor and vegetative growth

Date headed is the day when 80 to 90 percent of the heads have ruptured the boot.

Fertilization programs are described in the footnotes of each table. Starter fertilizer was applied, at planting, at all locations, and all winter wheat trials were top-dressed with supplemental nitrogen in the spring.

Soil test results for each of the trials, in 2005, are presented in the footnotes. The soil test values for phosphorus (P) and potassium (K) are expressed in parts per million (ppm) instead of pounds per acre (lbs./acre). To change ppm to lbs./acre, multiply ppm by 2. Conversely, to change lbs./acre to ppm, divide lbs./acre by 2.

Seeding rates for proprietary wheat entries were chosen by the owner, and ranged from 1.4 to 1.6 million live seeds per acre. Public wheat varieties were seeded at 1.5 to 1.8 million live seeds per acre, and the oat trials were seeded at 1.69 million live seeds.

Seed Size and Plant Populations

Seed size will vary among seed lots for any entry. In extreme cases, the smallest size seed may contain nearly double the number of seeds per bushel in comparison with the largest size seed.

A final stand of 1 to 1.3 million plants per acre, or 30 plants per square foot, is the optimum population for soft red winter wheat production in Indiana. Yields generally plateau at this population and any additional yield increases are due to favorable weather combined with best management practices.

Approximately 90 percent of the live seed sown should emerge, if high quality seed is sown in a firm, moist seedbed. A seeding rate of 1.5 million live seeds per acre should produce a final stand of 1.35 million plants per acre, which is about 30 plants per square foot.

The number of seeds per pound may be determined by counting out 100 seeds and weighing them on a gram scale (most grain elevators have one). Divide the weight of the 100-seed sample into 454 (the number of grams in a pound), and multiply by 100 (the number of seeds counted). Example: 100 seeds weigh 3.2 grams; 454 divided by 3.2 times 100 = 14,188 seeds per pound. Then adjust for germination to determine the final seeding rate. If the seed germinates 95 percent, there will be 13,478 live seeds per pound (14,188 times 0.95). Dividing 1,500,000 by 13,478 gives 111 pounds of seed per acre, or the amount needed to establish a stand of 30 plants per square foot.

This information is useful in deciding the population you want to achieve in the original stand, and for decisions you may need to make regarding an inadequate stand. Ask your seed dealer to furnish the seed count, in number of seeds per pound, and the recommended seeding rate for the seed lot you are planting. Then calculate the pounds per acre needed to provide an optimum population in the original stand.

The same principle applies to oats. However, the original stand is more important in oats, because during some seasons there may be little or no tillering, particularly if seeding is delayed, or moisture is deficient. The recommended oat population is 35 plants per square foot or 1.52 million plants per acre. This would require a seeding rate of 1.69 million live seeds per acre, assuming 90 percent emergence.

A plump-seeded oat variety (3 grams per 100 seeds) would require about 118 pounds of live seeds per acre. Use the same procedure for calculating oat seeding rates and stands as for wheat, but remember that oat populations need to be greater than wheat populations.

Stand reductions, in winter wheat, may occur if winter conditions are severe. The wheat plant, if properly hardened through a gradual hardening process, should be able to tolerate temperatures as low as –5° F without injury. At temperatures of –5° to –10° F injury could occur if unfavorable conditions such as dry soil, low phosphorus, late planted and/or small plants, or other plant stresses are present. If temperatures reach -10° F or lower, and remain at that temperature for two hours or longer, injury is likely. The extent of the injury will depend on the condition of the plant, how low the temperature, and how long it remains at that level.

Snow cover of 1 to 2 inches on wheat offers excellent protection against sub-zero temperatures. If cold weather is forecast, keep a record of the amount of snow cover, the extreme low temperature and the duration of that low temperature. This will be useful information in predicting the possibility of damage to the wheat crop. For information on temperatures that cause freeze injury to wheat, during spring growth, see Table A, page 16.

When making stand counts on small grains, divide 144 (the number of square inches in a square foot) by the drill row spacing in inches to get the number of linear inches of drill row needed to equal 1 square foot. Example: 144 divided by 7 inches (drill row spacing) = 20.5 inches of linear drill row needed to equal 1 square foot. Make numerous random spot checks throughout the field by counting the number of plants or seeds in 20.5 inches of row length, and average several observations to estimate the population.

For purposes of making yield estimates, each wheat plant should produce one main stem (culm) and one or more tillers. The main stem normally produces a head, but under stress the tillers may not produce heads. Less than ideal conditions reduce grain production in the tiller first and then in the main stem.

One head of wheat usually produces one gram of seed (or grain), which is normally 30 to 32 grains of wheat. One head of wheat per square foot is equal to 1.6 bushels per acre. At 30 heads per square foot (one head per plant), the estimated yield potential is 48 bushels per acre.

At 30 plants per square foot, under ideal growing conditions, each plant may produce two heads (one on the main stem and one on the tiller), which would have a yield potential of 96 bushels per acre.

A population of 15 plants per square foot may produce acceptable yields (15 to 20 percent yield loss), but 10 plants per square foot may reduce yields by 50 percent or more, and weed problems are likely.

Due to unusually warm weather during the winter of 2001-2002, questions were raised about vernalization of the winter wheat crop. Dr. Fred Patterson, Wheat Breeder and Professor Emeritus of the Purdue University Agronomy Department provided the following information on vernalization:

> **Vernalization** requirement of winter wheat is the period of cold conditioning necessary before the wheat plant will go from the vegetative tillering stage into the jointing and heading stages. Temperatures just above freezing are adequate. Different winter wheat cultivars (varieties) have different lengths of vernalization requirements from about 42 to 70 days. In a vernalization cold room for greenhouse winter wheat plants, Purdue wheat breeders use 65 days at 36° to 38° F, with short day-length light period of 12 hours. For a normal Indiana winter wheat crop, the vernalization requirement would be met by about January first. If vernalization is interrupted by a period of hot weather, as sometimes occurs in south Texas, winter wheat does not resume vernalization and would not head.
>
> Cold acclimatization for survival is a separate process and requires below freezing temperatures to develop the ability of the wheat plants to survive Indiana's coldest winter periods.

PERFORMANCE TRIAL RESULTS

An analysis of variance and a test of significance were computed on all performance categories where sufficient data were available. The analysis of variance for bushels per acre yield, was significant at the 10 percent probability level this year (2005) for the single-year, single location, yield data presented, except for the (regular date-of-seeding, and late-seeded) winter wheat trials in Tippecanoe County, Location 2, (Tables 2 and 3); the spring oat trial in Porter County, Location 1, (Table 8), and the spring oat trial in Tippecanoe County, Location 2 (Table 9). Yates iterative procedure was used to calculate data for missing plots.

The Waller-Duncan Bayesian k-ratio t test is used in determining significant differences for the Indiana small grain performance trials. The Bayesian procedure has a direct dependence upon the calculated F-value for entries. As the F-value increases, the Bayesian least significant difference (BLSD) decreases. In computing the BLSD for the test of significance, a k ratio of 100:1 was used. This ratio may be considered in a loose sense to take the place of the 5 percent level of significance. The BLSD value may be used to make all possible pair-wise comparisons, i.e., any two values in the same column of a sub-table may be compared.

Multiple-year results, especially those having the greatest number of years, are generally best for predicting performance. This is because no interaction of entries by years can be computed for one-year data. This interaction (entry by year) is usually larger than the experimental error in one-year analyses.

The coefficient of variability (C.V.) is an indication of the precision of the test. The coefficient

lows from 48° to 77° F. Eleven July days had temperatures of 90° F or above. The oat trial was harvested on July 11, before rain arrived.

From October 1, 2004 through March 31, 2005 the wheat trial received a total of 19.08 inches of moisture, which was about 28 percent above the normal 14.85 inches for that period. From April 1, 2005 through June 30, 2005, rain totaled 6.78 inches, which was about 42 percent less than the normal 11.67 inches for that period. Total moisture for the wheat trial was 25.86 inches compared to 26.52 inches which is the long term average for the same period. The oat trial, from planting to harvest, received 7.34 inches of rain, which is about 37 percent, or 4.33 inches, below the long term precipitation average for that period.

Data for 2005 winter wheat trial, reported in Table 1, Location 1, are the most normal, and therefore probably the best source of information of any winter wheat trial reported in this bulletin. Yields are higher, test weights heavier, and heading dates later than in previous test years. Precision in the trial (C.V) is similar to previous years.

The oat trial at Location 1, presented in Table 8, has yields and test weights similar to the three year data (2003-2005). Heading dates are similar to previous years. Yields are not, statistically, significantly different in either the 2005 trial data, or the multiple year averages.

Wheat and Oat data from Location 1 are also included in the 2005 multi-location averages in Tables 7 and 10 respectively.

At Location 2 (Tippecanoe Co.)**,** in 2004, August rain totaled 3.85 inches with most of it coming during the last half of the month. September had 2 showers, 0.14 and 0.37 of an inch, which came on September 4 and 7, respectively. Normal rainfall for August is 3.68 inches and for September, 2.98 inches.

The regular date-of-seeding wheat trial was planted October 1 (less than a week after the Hessian fly-free date). The soil was dry, and when cultivated, made a seed bed of powdery dust. Soybean residue contributed to planting problems, causing uneven planting depth and seed distribution. October rain totaled 2.86 inches for the month, and came in showers of approximately half an inch or less. Normal rainfall for October is 2.73 inches. Daily high temperatures ranged from 47° to 82° F. Low temperatures ranged from 24° F (October 5) to 54° F (October 27). The regular date-of-seeding wheat trial, at the end of the month, was 2 to 3 inches tall, but stands were poor and growth uneven.

The late-seeded wheat trial was planted October 26, 2004 (about three weeks after the Hessian fly-free date). The seed bed was wet, but much improved over the regular date-of-seeding trial. By November 5, the late-seeded wheat had developed good stands and plants were about one inch tall.

November rain (4.55 inches) was distributed throughout the month. Normal November rain is 3.08 inches. Temperatures were mild. Daytime highs ranged from 36° to 66° F, and nightly lows from 21° to 55° F. Wheat growth and development continued through November.

Temperatures cooled slowly at the beginning of December. Daytime highs ranged from 10° to 60° F and nightly lows, from –6° to 44° F. The coldest December temperature (-6° F) came on the night of December 27. Precipitation for the month was 4.15 inches, normal is 2.43. Snow arrived on December 23, and provided 3 to 5 inches of cover during the coldest nights of the month. Total December snow was 5.6 inches.

January snow did not arrive until January 8 and then came again at the end of the month. The first snow provided 3 inches of snow cover and the last snow, 4 inches. Snow fall totaled 10.3 inches. Precipitation for the month totaled 5.94 inches, normal is 1.79 inches. Temperatures ranged from daily highs of 9° to 65° F, to nightly lows of –5° to 50° F. The coldest January 2005 temperature (-5° F) came on January 23.

February had 2.65 inches of precipitation, normal is 1.57 inches. Snow cover (from January) remained in depths of 1 to 2 inches during the first 4 days of the month. Two inches of February snow did not remain to provide cover. Temperatures ranged from daily highs of 26° to 62° F, and nightly lows from 9° to 40° F. The coldest February temperature (9° F) was on February 3. The warmest temperature (62° F) was on February 16. Wheat remained dormant during the month.

March precipitation was 1.17 inches, normal is 2.84 inches. An inch of snow came on the first day of the month and remained for 1 day. That was the end of snow cover for the season. March temperatures fluctuated from 28° to 77° F during the day, and from 11° to 43° F at night. The coldest March night temperature (11° F) came on March 3. Wheat growth began during the last half of March. The spring oat trial was planted on March 18 in a firm, moist seed bed. There were some skips in oat planting, but otherwise, emergence was uniform and adequate stands were established.

Eleven April rain showers (all in amounts of half an inch or less) totaled 2.04 inches. April normal precipitation is 3.57 inches. April night temperatures ranged from 29° F to 55° F. Day temperatures ranged from 40° F to 86° F.

May rain totaled 1.80 inches, 3.93 inches is normal. Most of the rain came between May 12 and 20. The last 11 days of the month received no measurable moisture. Day temperatures ranged from 50° to 89° F, and night temperatures from 27° to 60° F. Wheat and oats developed rapidly during May.

June rain totaled 2.01 inches, 4.24 inches is normal. Rain was distributed among 10 showers. Most of the rain came in amounts of half an inch or less. Eleven consecutive days (June 17 through 27) received no moisture. Temperatures were hot. Daily highs ranged from 66° to 95° F, and nightly lows ranged from 42° to 71° F. Thirteen days had high temperatures of 90° F or above.

The regular date-of-seeding, wheat trial was harvested July 1, and the late-seeded wheat trial was harvested July 6. The spring oat trial was harvested July 11. July rain, for the month, totaled 4.60 inches, normal is 3.81. Only 0.35 of an inch of rain fell before the late-seeded wheat and the spring oat trials were harvested. Temperatures were warm and ranged from 77° to 94° F during the day. Night temperatures ranged from 48° to 76° F. Seven July days had high temperatures of 90° F or above.

From October 1, 2004 through March 31, 2005 the winter wheat trials received 21.32 inches of precipitation. This was 6.88 inches (or 48 percent) above the 14.44 inches which is normal for that period. From April 1, 2005 through June 30, 2005, rain, on the winter wheat trials, totaled 5.85 inches, which was 5.89 inches (or 49.8 percent) below the normal 11.74 inches for that period. In July, 0.35 of an inch of rain fell on the late-seeded wheat and spring oat trials before they were harvested, but that amount of rain had no affect on the trials. Total precipitation for the wheat trials was 27.17 inches. The long term average is 26.18 inches for the same period. The spring oat trial, from March 18 planting through July 11 harvest received 13.02 inches of rain.

The regular date-of-seeding and the late-seeded wheat trials, in 2005, do not provide acceptable data for performance comparisons. In addition to problems in establishing the original stand, there was loss of stand during the winter. At the time winter killing notes were taken, some plots appeared to be completely depopulated. During spring, the stand in some plots improved, hence the yields in plots that appeared to have a nearly complete loss of stand. Although some yields are, statistically, significantly different in the regular date-of-seeding trial, the data are of limited, if any, value. Data from 2004 and previous test years are available in Tables 2 and 3 (pages 19 and 20) of the 2004 bulletin. The 2004 bulletin is available at the URL address presented on page 3 of this bulletin. Winter wheat trial results at Location 2, are presented in Tables 2 and 3, but are not included in the multi-location averages presented in Table 7.

The spring oat trial at Location 2, Table 9, produced impressive yields and test weights. Yield differences are not, statistically, significantly different and the data should not be considered reliable for performance comparisons. Oat data from Location 2 are included in the 2005 multi-location averages, in Table 10, which are also of limited value

At Location 3 (Randolph Co.), in 2004, August rain totaled 4.35 inches. September rain (0.11 of an inch) came in two showers, one on September 17 (0.08) and the other on September 29 (0.03). Normal rain for August is 3.65 inches, and 3.02 inches for September. The winter wheat trial was planted September 29 (Hessian fly-free date) in a very dry seedbed. Soybean crop residue and dry soil contributed to planting problems, and caused uneven emergence and uneven stands.

October received above normal precipitation, with measurable rain on ten days. Rain totaled 3.01 inches for the month, normal is 2.62. Frost and the first hard freeze (29° and 28° F) came on October 3 and 5, respectively. Daytime temperatures ranged from 44° to 78° F, and nighttime lows from 28° to 58° F.

November was mild, with daily high temperatures ranging from 38° to 66° F, and nightly lows from 22° to 54° F. Rain for the month totaled 3.84 inches, normal is 3.23.

December precipitation totaled 1.42 inches. Normal December precipitation is 2.58 inches. Snow arrived (5.0 inches) December 23 and provided snow cover for the rest of the month. Daytime temperatures ranged from 5° to 60° F, and night temperatures from –19° to 46° F. The coldest December temperature (-19° F) was on December 25.

January precipitation was 8.76 inches, 1.94 is normal. January snow totaled 12.3 inches. Temperatures ranged from 12° to 64° F during the day, and from –7° to 58° F at night. Coldest temperatures were recorded the third week of the month, and during that time, snow cover provided some protection from the cold.

February precipitation was 1.45 inches. Normal precipitation is 1.84 inches. Snowfall totaled 2.7 inches. Snow cover remained during the first part of the month. Temperatures ranged from 24° to 63° F during the day, and from 9° to 37° F at night.

March precipitation totaled 1.96 inches, which included 1.8 inches of snow. Normal March precipitation is 2.69 inches. Daytime high temperature ranged from 25° to 75° F, and night temperatures from 13° to 47° F. Wheat began spring growth in late March. Winter killing was not a

serious problem, spring growth was vigorous and plant color was good.

April rain total was 4.41 inches, 3.50 is normal. Temperatures were mild. Daily high temperatures ranged from 41° to 81° F, and nightly lows from 29° to 56° F.

May received 1.72 inches of rain. Normal rainfall is 4.06 inches. May temperatures ranged from 48° to 86° during the day, and 29° to 61°F at night. Although rain was less than half the normal amount, available soil moisture and mild temperatures combined to provide excellent growing conditions for wheat. Disease was not a problem during heading, and the wheat trial made good progress during May.

June was dry and hot. Rain totaled 1.83 inches, less than half the normal 4.42 inches. Daily high temperatures ranged from 68° to 96° F. On nine June days, temperatures reached 90° F or above. Night temperatures ranged from 50° to 70° F. Wheat matured rapidly in June.

The wheat trial was harvested July 8, 2005 under ideal conditions. From planting to harvest, the trial improved dramatically. A week before harvest, 0.95 of an inch of rain fell on the plots, but had no affect on the trial

From October 1, 2004 to March 31, 2005 the winter wheat trial received 20.44 inches of moisture, or 5.54 inches (37 percent) more than the normal 14.9 inches for that period. From April 1, 2005 through June 30, 2005, rain totaled 7.96 inches which was 4.02 inches (66 percent) below the normal 11.98 inches for that season. From October through June, precipitation totaled 28.4 inches. October through June, normal precipitation is 26.88 inches.

Trial results, for Location 3, presented in Table 4, have higher yields, normal test weights, taller plant heights and are similar, in other traits, to previous years data. Heading dates are 3 or 4 days later than in previous years. Precision in the trial is good and the data should be useful for making performance comparisons. Recovery from planting problems was impressive.

At Location 4 (Knox Co.)**,** in 2004, August precipitation came mostly during the last half of the month, and totaled 3.55 inches. Normal August rain is 3.72 inches. September precipitation came in three showers, during the first half of the month, and totaled 1.04 inches. Normal September precipitation is 3.16 inches.

The wheat trial was planted October 7, 2004 in sandy soil, with some moisture available. October rain totaled 9.27 inches and came, mostly in the latter half of the month, in 14 showers, the largest of which was 1.99 inches. Normal rain for October is 3.21 inches. Daytime temperatures ranged from 61° to 83° F, and night temperatures from 32° to 59° F. Wheat emergence was rapid and uniform stands were established.

November rain totaled 4.31 inches, 4.26 inches is normal. Daytime high temperatures ranged from 43° to 76° F, and nightly lows ranged from 21° F to 56° F. The first frost came on November 8. The first freezes (26° to 29° F) came on November 13, 14 and 15. The wheat trials developed excessive vegetative growth during November.

December precipitation totaled 2.11 inches, normal is 3.24 inches. Snowfall totaled 10 inches. Snow came on December 22 and remained until December 29. During that period, temperatures were the coldest of the season. During the day, temperatures ranged from 14° to 64° F, and at night the range was from –12° to 51°F.

The middle of January was the coldest part of the month. Single-digit low temperatures, for 4 days, ranged from 3° to 5° F. Snow arrived (1.3 inches) on January 30. Precipitation for January was 6.92 inches, normal is 2.60 inches. The wheat plots were flooded and remained covered with water for approximately 2 weeks (January 17 to 31). The trial was assumed to be lost.

February precipitation was 1.96 inches, normal is 2.51. The range of daytime high temperatures was from 32° to 69° F. Night temperatures ranged from 19° to 40° F. Snow cover was brief, occurring and remaining, on only two days of the month.

March day temperatures ranged from 33° at the beginning of the month, to 76° F on the last day, and averaged 51° F. Night temperatures ranged from 18° to 49° F, and averaged 31° F. The coldest night temperature (18° F) was on March 10. After that, temperatures moderated and remained favorable for wheat growth. The wheat trial survived, recovered from January flooding, and developed good stands. Rain, for March, totaled 1.71 inches, normal is 3.60.

Temperatures warmed in April and averaged 68° F for daytime highs, and 46° F for nighttime lows. Day temperatures ranged from 42° to 83° F, and night temperatures from 35° to 59° F. Rain totaled 3.30 inches, normal is 4.28. Wheat made rapid growth and continued to improve during April.

May was warm. High temperatures ranged from 54° to 90° F, and averaged 76° F. Nightly low temperatures ranged from 34° to 64° F, and averaged 50° F. Wheat heading was underway the first week of May. May rain totaled 5.04 inches, normal is 5.13. Most of the rain came in the middle of the month. The heaviest rain (1.88 inches) came on May 12.

June rain totaled 4.25 inches, normal is 4.05. Prior to harvest (June 23) the trial received 3.97 inches of rain. Day temperatures ranged from 66° to

91° F from June 1 through June 23, and night temperatures ranged from 54° to 72° F.

From October 1, 2004 through March 31, 2005, the wheat trial received 26.28 inches of moisture; 6.86 inches (35 percent) more than the 19.42 inches which is normal for that period. From April 1, 2005 through June 23, 2005, the trial received 12.31 inches of rain, which is about an inch below normal. Total precipitation for the winter wheat trial was 38.59 inches, or 5.97 inches (18 percent) more than the 32.62 inches which is normal for the entire period. During the spring, 2005, winter wheat growing season, daytime high temperatures reached 90° F or above, four times (May 12, June 6, 8, and 11).

Trial results for Location 4, in 2005, presented in Table 5, produced higher yields, and heavier test weights, than in previous years. No lodging occurred, and heading dates were 3 days later than in previous years. Precision in the trial was very acceptable, and the data may be useful in comparing performance between entries in the trial. Data from Location 4 are included in Table 7, multi-location data for 2005.

At Location 5 (Jennings Co.)**,** in 2004, August rain totaled 3.41 inches, September 0.11 inches, and October 4.95 inches. Normal rain for August is 4.42, September 2.89, and October 3.19 inches.

The wheat trial was planted October 6, 2004 (Hessian fly-free date) in a dry, cloddy seedbed. Five days after planting, light showers began arriving and 12 days after planting, the heaviest October rain (2.90 inches), provided too much water for the wheat trial. Most of the October precipitation came the last half of the month. October temperatures ranged from 51° to 81° F during the day and averaged 68° F for the month. Night temperatures ranged from 31° to 64° F and averaged 57° F for the month. Wheat stands were adequate but not impressive.

November rain totaled 4.25 inches, normal is 3.83 inches. The first hard freeze (28° F) came on the night of November 9. Day temperatures ranged from 71° F at the beginning of the month to 42° F near the end of the month. Nightly lows ranged from 55° F down to 28° F. One major rain (1.42 inches) fell on November 11, and most of the rain came in showers of less than half an inch.

December precipitation totaled 3.61 inches, 3.40 is normal. December daytime high temperatures ranged from 20° to 65° F, and nightly lows ranged from –17° to 52° F. Snow arrived on December 22 and 23, and provided cover during the coldest temperatures of the winter. The coldest December temperature (-17° F) came on December 25.

During January 2005, daytime high temperatures ranged from 17° to 67° F, and nightly lows ranged from 1° to 60° F. Precipitation for January totaled 7.60 inches, 2.97 inches is normal. Most of the rain (5.18 inches or 68 percent of the total) came during the first week of the month. Soils were saturated and remained so, during most of the month. Light snow cover provided some protection during the coldest January temperatures.

February precipitation totaled 2.02 inches, 2.71 inches is normal. Temperatures ranged from daytime highs of 31° to 69° F, and nightly lows from 17° to 43° F. Snow arrived the first week of February but did not remain beyond the first week of the month. Most of the wheat cultivars came through the winter months of December, January and February with little winter damage.

March precipitation totaled 3.01 inches, 3.76 is normal. March night temperatures ranged from 14° F (March 3) to 48° F on March 30. Day temperatures ranged from 31° F (March 1) to 76° F on March 30. Wheat began spring growth in March.

April rain totaled 3.76 inches, normal is 4.37 inches. Daytime high temperatures ranged from 50° to 83° F. Nightly low temperatures ranged from 33° to 60° F. Wheat made rapid growth and development in April and May.

May temperatures continued warm, but precipitation was below normal. Rain totaled 3.31 inches, 4.72 inches is normal. Seven days in May had temperatures at or above 80° F. Daily high temperatures ranged from 53° to 87° F, and nightly lows ranged from 31° to 62° F.

June was hot and dry with 10 days of temperatures at or above 90° F. Temperatures ranged from 67° to 95° F during the day, and from 51° to 72° F at night. June rain totaled 1.94 inches, 3.82 inches is normal. The wheat trial was harvested June 28, 2005.

From October 1, 2004 through March 31, 2005, the winter wheat trial precipitation totaled 25.44 inches, 5.58 inches or 28 percent above the 19.86 inches, which is normal for that period. From April 1, 2005 through June 30, 2005, rain totaled 9.01 inches, which was 3.9 inches or 30 percent below the 12.91 inches, which is normal for that period. For the winter wheat growing season, precipitation totaled 34.45 inches, compared to 32.77 inches, which is normal for the season.

Trial results for Location 5, in 2005, presented in Table 6, are similar to trial results from previous years, and should be useful in making performance comparisons. Precision in the test (C.V.) was acceptable. Grain yields were higher and test weights heavier, than in previous years. Lodging was better, plant height the same, and winter killing was more obvious than in previous years. Heading dates were a day or two later than normal. Multi-location data, which includes Location 5 can be found in Table 7.

Weather Summary

Information presented in this section is based on the weekly Indiana Crop and Weather Report, published by the Indiana Agricultural Statistician.

For the week ending September 20, 2004, Indiana topsoil moisture was rated 3 percent very short, 28 percent short, 67 percent adequate and 2 percent surplus. Subsoil moisture was similar to topsoil, and was rated 4 percent very short, 17 percent short, 75 percent adequate and 4 percent surplus. Three percent of the winter wheat crop was planted, compared with 3 percent last year and 3 percent for average. There was virtually no rain, statewide, the last week of September. Topsoil became drier with 14 percent rated very short, 43 percent short, 43 percent adequate and none rated surplus. At the end of the month the wheat crop was 6 percent planted, which was on par for average.

Wheat planting made rapid progress during dry weather and by October 3, the crop was 25 percent planted. By mid-October, wheat planting (44 percent planted) was ahead of last year, and ahead of the five-year average of 36 percent planted. Soils became progressively drier. Topsoil was rated 33 percent very short, 43 percent short, 23 percent adequate and 1 percent surplus. Much needed rain arrived the last half of October. Topsoil moisture improved, and was rated 1 percent very short, 6 percent short, 73 percent adequate and 20 percent surplus by the end of the month. The wheat crop was 82 percent planted compared to 90 percent for average.

At the beginning of November, 88 percent of the wheat was planted, compared with 97 percent for average. Seventy-nine percent of the wheat acreage had emerged, 84 percent is average. By November 15, 2004, ninety-four percent of the wheat was planted, and 84 percent had emerged, which was a few days behind average.

The final crop and weather report for 2004, issued November 15, reported the condition of the wheat crop to be 1 percent very poor, 4 percent poor, 22 percent fair, 59 percent good and 14 percent excellent. Statewide, topsoil moisture was rated 0 percent very short, 3 percent short, 68 percent adequate and 29 percent surplus. Subsoil moisture was rated 1 percent very short, 7 percent short, 78 percent adequate and 14 percent surplus.

The first Indiana Crop and Weather report for the 2005 growing season, issued for the week ending April 4, 2005, rated the wheat crop as 3 percent jointed compared to 9 percent jointed for the 5-year average. The wheat condition was rated 69 percent good to excellent compared to 85 percent for the previous year. Soil moisture ratings (in percent) for topsoil were, very short 0, short 2, adequate 60, and surplus 38. Subsoil moisture ratings were, very short 0, short 3, adequate 77, surplus 20 percent.

Wheat jointing and heading proceeded at a nearly normal pace, statewide, during April. The crop was rated 72 percent good to excellent compared to 86 percent last year. Soil moisture remained mostly adequate to surplus.

In mid May, the wheat condition was rated 68 percent good to excellent compared to 84 percent last year. Forty-three percent of the crop had headed compared to 56 percent for average. By the end of May the wheat crop rating remained at 68 percent good to excellent. Eighty-seven percent of the crop was headed compared to 94 percent for average. Topsoil moisture was rated 71 percent adequate and 8 percent surplus. Subsoil was 13 percent short, 78 percent adequate and 6 percent surplus.

By June 5, wheat was ninety-seven percent headed, which was average. The crop was rated 65 percent good to excellent, compared to 70 percent last year. The June 19 report indicated wheat harvest was 5 percent complete, and by June 26, wheat harvest was 29 percent completed, compared to 32 percent for average. Both topsoil and subsoil became progressively drier in June and by the end of the month topsoil was rated 16 percent very short, 49 percent short, 35 percent adequate and 0 surplus. Subsoil was rated 8 percent very short, 38 percent short, 53 percent adequate and 1 percent surplus.

By July 3, 53 percent of the wheat was harvested compared to 56 percent for average. A week later, July 10, 86 percent of the wheat was harvested compared to 78 percent for average. Wheat harvest in the north was 66 percent complete, 91 percent in central Indiana and 98 percent in southern Indiana. Statewide, by July 17, 98 percent of the wheat crop was harvested. Topsoil moisture was 16 percent very short, 34 percent short, 47 percent adequate and 3 percent surplus. Subsoil moisture was 18 percent very short, 38 percent short, 44 percent adequate and 0 percent surplus.

In summary, the crop was established in a timely manner and came through a relatively mild winter. Dry weather, after wheat headed, continued through filling and ripening, and consequently disease levels were lower than in previous years. Grain yields were impressive and grain quality better than normal.

State-wide Harvest Summary

The Indiana Agricultural Statistics Service, in a report issued July 20, 2005, estimated the 2005 Indiana winter wheat production as follows:

> Based on conditions July 1, Indiana's 2005 winter wheat crop is expected to total 22.1 million bushels, 19 percent below last year's estimate of 27.3 million bushels. The expected yield of 65 bushels per acre is unchanged from the June 1 forecast. If realized, this would be 3 bushels above last year, but 4 bushels below the record of 69 bushels per acre established in 2003. Intended acreage for harvest as grain, at 340,000 acres, is down 23 percent from a year earlier. As of July 10, wheat harvest had advanced to 86 percent complete. This compares with 93 percent last year and 78 percent for the average.
>
> United States winter wheat production is forecast at 1.53 billion bushels. This is down 1 percent from last month but 2 percent above 2004. The U.S. yield is forecast at 44.5 bushels per acre, up 0.4 bushels from last month.

INFORMATION CONCERNING SEED

Information concerning certified seed may be obtained from the Indiana Crop Improvement Association, which certifies seed from both public and private sources. Publicly developed varieties, presented in this bulletin, are listed under the Indiana Crop Improvement Association address. In both the wheat and oat trials, older public varieties are included as check varieties.

Private companies have requested that inquiries concerning proprietary entries, presented in this bulletin, be directed to the addresses listed below.

Other names associated with the entry name are brand or company names usually associated in the trade with the entry name.

AgriPro Wheat
520 East 1050 South, P.O. Box 411
Brookston, Indiana 47923
Telephone: 765-563-3111

Benton	AgriPro
Cooper	AgriPro

Excel Brand Seed
257 East Hail
Bushnell, Illinois 61422
Telephone: 309-772-2070

Excel 211
Excel 352TW
Excel 354TW
Excel 388
Excel 392
Excel 399
Excel 410TW

Indiana Crop Improvement Assoc.
7700 Stockwell Road
Lafayette, Indiana 47909
Telephone: 765-523-2535

Oats

Classic	Public
Esker	Public
INO 9201	Public
Jay	Public
Robust	Public
Spurs	Public
Woodburn	Public

Wheat

Clark	Public
Patterson	Public
Roane	Public

Miles Seed
P.O. Box 22879
2760 Keller Road
Owensboro, Kentucky 42304
Telephone: 270-926-2420

Esther	Exsegen
Judith	Exsegen
Leah	Exsegen
Rachel	Exsegen
Rebekah	Exsegen
Sarah	Exsegen

Ohio Seed Improvement Assoc.
6150 Avery Road, P.O. Box 477
Dublin, Ohio 43017
Telephone: 614-889-1136

Bravo	OSIA
Daisy	OSIA
Hopewell	OSIA

Royster-Clark, Inc.
717 Robinson Road SE
Washington C.H., Ohio 43160
Telephone: 740-869-2181

Vigoro	Tribute
Vigoro	V9410
Vigoro	V9412
Vigoro	V9512
Vigoro	V9513

Steyer Seeds
6154 North County Road 33
Tiffin, Ohio 44883
Telephone: 419-992-4570

Besecker	Steyer
Coffman	Steyer
Merrell	Steyer
Wiley	Steyer

Syngenta Seeds, Inc.
778 County Road 680
Bay, Arkansas 72411
Telephone: 870-483-7691

NK Coker 9312

Virginia Crop Improvement Assoc.
EVAREC
2229 Menokin Road, P.O. Box 338
Warsaw, Virginia 22572
Telephone: 804-333-3485

McCormick	Public

DISCUSSION

Soft Red Winter Wheat

Indiana's climate and soils are well suited for the production of high quality soft red winter wheat. In the southern half of Indiana, where double cropping (wheat-soybeans) is common, many growers plant early maturing varieties. Even in northern Indiana, varieties with relatively early maturity may produce higher quality grain because they mature before hot, humid weather which often occurs during July.

Wheat varieties differ in agronomic characteristics. Each has certain advantages, but none possess all of the most desirable traits. Winter hardiness, grain yielding ability, grain quality, straw strength, plant height, and resistance to diseases and insects are important traits to consider when choosing which wheat to plant.

Many diseases attack wheat in Indiana. Resistant varieties are the mainstay for managing disease. A grower should carefully examine resistance ratings for any wheat considered for production. The originator of a variety should have resistance ratings for the diseases mentioned in this discussion, and seed dealers should have this information available for customers.

Important wheat diseases in Indiana include root rots, several leaf diseases, and diseases of the wheat head itself. Probably the most consistently troublesome wheat disease in Indiana is leaf blotch, caused by either of two fungi, *Septoria tritici* and/or *Stagonospora nodorum*. Both fungi cause a foliage blight that results in premature leaf death and poorly filled grain. *Stagonospora nodorum* can also infect heads, producing a disease known as glume blotch.

Varieties differ in their degree of susceptibility to leaf and glume blotch, but none has a high degree of resistance. Partial resistance, which tends to keep the upper two leaves green until normal maturity, can protect test weight.

Early seeding favors leaf blotch, yellow dwarf, spindle streak, and the fungus root and foot rots, especially take-all. Seeding after the Hessian fly-free date (see Figure 1, page 4) is suggested to reduce the severity of these diseases.

In addition to *Stagonospora nodorum*, three other fungi can infect wheat grain directly. Loose smut and common bunt are two diseases with a long history in Indiana, but have been essentially eliminated by the use of modern, systemic fungicide seed treatments. The best time to detect loose smut is just after the wheat heads. Of much greater concern is scab (*Fusarium* head blight). A widespread

fungus, *Fusarium graminearum*, can infect wheat during flowering and early grain filling. Infected grain is badly shriveled, resulting in low test weight. The grain may also contain a toxin produced by the fungus (deoxynivalenol, also known as DON or vomitoxin). Elevators may refuse to buy grain that has more than 2 to 4 ppm of DON. Wheat breeders are working to develop varieties resistant to scab, but so far only a few varieties, with a modest degree of resistance, have reached the marketplace.

Three other potentially damaging diseases are powdery mildew, leaf rust, and stem rust. Fortunately, most varieties adapted to Indiana have good resistance to these diseases. The pathogens which cause these diseases are genetically variable, and strains may arise that can overcome resistance. However, in recent years, this has not been a serious problem in Indiana.

The resistance of some varieties to powdery mildew is of the partial type. Powdery mildew will develop in these varieties, but does not normally become severe enough to damage the crop. High levels of nitrogen, even if not sufficient to induce lodging, can negate partial resistance and result in severe disease in a variety that would not be damaged under moderate levels of nitrogen.

In most years (normal warm weather), wheat matures before stem rust has time to reach destructive levels. However, in years when maturity is delayed, because of cool spring weather, stem rust may reach damaging levels during late June. Some wheat, offered for sale in Indiana, may not have resistance to stem rust.

Three virus diseases of wheat are common in Indiana: wheat spindle streak, soilborne wheat mosaic, and yellow dwarf. Most varieties have at least some resistance to the viruses that cause these diseases. A susceptible variety can be severely damaged by any one of these diseases.

Wheat performance data are presented in Tables 1 to 7.

Wheat Hybrids and Blends

Proprietary wheat hybrids were first included in the 1982 performance trials. Some hybrids were produced using a chemical to sterilize pollen in the seed parent. Other hybrids were produced using the cytoplasmic male sterile and nuclear restorer system. Techniques of hybrid wheat production are often less than 100 percent effective. Therefore, the seed produced on the seed parent may not be 100 percent hybrid.

By Indiana law, seed labeled as hybrid must contain at least 75 percent hybrid seed, and if less than 95 percent hybrid, the hybrid percentage must be stated on the seed label.

Seed having less than 75 percent hybrid is considered a blend. Seed from hybrid wheat, like corn, should not be saved for seeding the following year.

Spring Oats

Spring oats are the most heat tolerant of the spring-seeded small grains and are the only spring-seeded small grain adapted for Indiana. Adaptation to hot weather is usually important in choosing a spring oat. Late maturing varieties perform well, if planted early, in years with ample rainfall and relatively cool temperatures during June and July.

Frequently in Indiana, temperatures are in the upper 80° and low to mid 90° F range, and moisture becomes a limiting factor when oats are filling. This results in low test weights and reduced yields in late-maturing varieties. The farther south a variety is planted, the earlier maturing and more heat tolerant it must be. Yield, straw strength, grain quality and resistance to barley yellow dwarf virus and crown rust are also important in choosing an oat variety.

Oat performance data are presented in Tables 8 to 10.

Table A. Temperatures that cause freeze injury to wheat, at spring growth stages. Symptoms and yield effect of spring freeze injury.

Growth stage	Approximate injurious temperature (2 hours)	Primary symptoms	Yield effect
Tillering	12° F (-11° C)	Leaf chlorosis; burning of leaf tips; silage odor; blue cast to the field.	Slight to moderate
Jointing	24° F (-4° C)	Death of growing point; leaf yellowing or burning; lesions, splitting , or bending of lower stems; odor.	Moderate to severe
Boot	28° F (-2° C)	Floret sterility; head trapped in boot; damage to lower stem; leaf discoloration; odor.	Moderate to severe
Heading	30° F (-1 C)	Floret sterility; white awns or white heads; damage to lower stem; leaf discoloration.	Severe
Flowering	30° F (-1° C)	Floret sterility; white awns or white heads; damage to lower stem; leaf discoloration.	Severe
Milk	28° F (-2° C)	White awns or white heads; damage to lower stems; leaf discoloration; shrunken, roughened, or discolored kernels.	Moderate to severe
Dough	28° F (-2° C)	Shriveled, discolored kernels; poor germination.	Slight to moderate

2005 Indiana Winter Wheat and Spring Oat Performance Trial Results, Tables 1 through 10.

Table 1. Results of winter wheat performance trials in Porter Co., Location 1, north west Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
Three-year average, 2003, 2004, 2005.							
Bravo	OSIA	105.1 *	59.7	0	37	0	5-15
McCormick	Public	103.8 *	60.1	0	32	0	5-16
Benton	AgriPro	103.4 *	57.5	0	34	0	5-17
Roane	Public	103.2 *	60.0	0	33	0	5-18
Daisy	OSIA	97.8 *	57.7	0	35	0	5-18
Hopewell	Public	96.1 *	56.5	0	36	0	5-19
Patterson	Public	93.7	59.4	0	36	0	5-15
Grand mean		100.4	58.7	0	35	0	5-17
BLSD (k=100)		10.0	1.5	ns	2	ns	1
C.V. (%)		6.1	0.9		4		1
Two-year average, 2004, 2005.							
Cooper	AgriPro	103.7 *	58.9	0	33	0	5-15
Bravo	OSIA	102.4 *	60.2	0	36	0	5-14
Roane	Public	101.3 *	60.1	0	33	0	5-16
McCormick	Public	100.9 *	60.2	0	32	0	5-15
Benton	AgriPro	97.8 *	57.8	0	33	0	5-16
Hopewell	Public	93.7 *	56.0	0	36	0	5-18
Patterson	Public	93.3 *	60.1	1	36	0	5-14
Daisy	OSIA	91.4	58.0	0	35	0	5-16
Grand mean		98.1	58.9	0	34	0	5-16
BLSD (k=100)		11.2	1.7	ns	2	ns	2
C.V. (%)		8.4	1.2	500	4		2
2005 results(3)							
Bravo	OSIA	114.6 *	60.8	0	36	0	5-17
Cooper	AgriPro	111.8 *	59.7	0	33	0	5-19
Roane	Public	109.3 *	61.2	0	32	0	5-20
Patterson	Public	108.7 *	60.8	0	37	0	5-18
McCormick	Public	107.3 *	60.0	0	32	0	5-19
Benton	AgriPro	107.3 *	59.0	0	33	0	5-19
Clark	Public	102.3 *	59.9	0	36	0	5-18
Daisy	OSIA	101.2	58.1	0	34	0	5-20
Hopewell	Public	101.1	57.2	0	35	0	5-21
Grand mean		107.1	59.6	0	34	0	5-19
BLSD (k=100)		13.1	1.0	ns	2	ns	1
C.V. (%)		6.5	1.2		4		1

Table 1 contd. Results of winter wheat performance trials in Porter Co., Location 1, north west Indiana.

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

(3) Conducted on the Pinney Purdue Agricultural Center, Wanatah.
Jon D. Leuck, superintendent.
Randomized complete block design: 4 blocks.
Soil type: Runnymede silt loam.
Soil test: pH 6.0, P 31 ppm (high), K 157 ppm (medium).
Fertility program: 300 lbs./acre 8-32-16 broadcast and incorporated prior to seeding. Topdressed March 4, 2005 with 300 lbs./acre of 34-0-0.
Rates of seeding: 1.5 to 1.8 million live seeds per acre.
Date of seeding: September 27, 2004.
Date of harvest: June 29, 2005.
Note: Yield data for four (2005) plots were calculated using Yates iterative procedure.

Table 2. Results of regular date-of-seeding winter wheat performance trials in Tipppecanoe Co., Location 2, west central Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
Three-year average, 2003, 2004, 2005.							
Roane	Public	83.6 *	58.5	10	32	2	5-12
Bravo	OSIA	79.9 *	56.9	3	36	2	5-11
Patterson	Public	78.4 *	56.3	14	35	1	5-10
Daisy	OSIA	76.8 *	54.8	12	35	1	5-12
McCormick	Public	75.0 *	57.6	13	31	4	5-12
NK Coker 9312		68.8 *	56.5	19	29	32	5-12
Hopewell	Public	68.1 *	55.1	13	35	1	5-14
Grand mean		75.8	56.5	12	33	6	5-12
BLSD (k=100)		ns	1.2	ns	1	ns	3
C.V. (%)		11.2	1.2	111	5	41	3
Two-year average, 2004, 2005.							
Roane	Public	75.3 *	59.8	14	31	3	5-13
Bravo	OSIA	71.5 *	58.2	4	36	2	5-12
Patterson	Public	68.0 *	58.3	20	36	2	5-11
McCormick	Public	63.7 *	59.2	19	32	6	5-13
Daisy	OSIA	62.1 *	56.1	17	35	2	5-12
Hopewell	Public	59.0 *	56.5	19	35	1	5-14
NK Coker 9312		49.8 *	57.6	29	29	48	5-13
Grand mean		64.2	58.0	17	33	9	5-13
BLSD (k=100)		27.8	1.6	ns	1	ns	ns
C.V. (%)		14.5	1.2	93	6	34	3
2005 results(3)							
Vigoro Tribute		62.0 *	60.0	0	28	14	5-16
Roane	Public	61.8 *	60.7	0	27	5	5-17
Bravo	OSIA	59.3 *	59.1	0	32	5	5-17
Vigoro V9512		58.9 *	59.6	0	33	1	5-15
Clark	Public	58.9 *	58.5	0	31	13	5-15
Patterson	Public	58.4 *	59.0	0	31	4	5-15
Vigoro V9513		58.0 *	59.4	0	29	10	5-18
Daisy	OSIA	53.8 *	57.2	0	32	4	5-16
Hopewell	Public	50.6 *	58.2	0	30	2	5-18
Vigoro V9412		47.7	59.6	0	28	30	5-17
McCormick	Public	42.2	59.6	0	27	12	5-18
NK Coker 9312		23.8	58.1	0	25	96	5-20
Grand mean		52.9	59.1	0	29	16	5-17
BLSD (k=100)		13.2	1.0	ns	3	17	2
C.V. (%)		17.4	1.2		7	80	3

Table 2 contd. Results of regular date-of-seeding winter wheat performance trials in Tipppecanoe Co., Location 2, west central Indiana.

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

(3) Conducted on the Purdue University Agronomy Center for Research and Education (ACRE), Lafayette. James J. Beaty III, superintendent. Randomized complete block design: 4 blocks. Soil type: Drummer (Chalmers) silt loam. Soil test: pH 6.3, P 24 ppm (medium), K 119 ppm (medium). Fertility program: 300 lbs./acre 8-32-16 broadcast and incorporated prior to seeding. Topdressed March 2, 2005 with 275 lbs./acre of 34-0-0. Rates of seeding: 1.4 to 1.8 million live seeds per acre. Date of seeding: October 1, 2004. Date of harvest: July 1, 2005. Note: Soybean crop residue (in 2004) contributed to planting problems. Wheat stands were not uniform in emergence, or in plant spacing in the row. Yield data for nine (2005) plots were calculated using Yates iterative procedure.

Table 3. Results of late-seeded winter wheat performance trials in Tippecanoe Co., Location 2, west central Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
Three-year average, 2003, 2004, 2005.							
McCormick	Public	80.1 *	57.0	4	30	9	5-16
Roane	Public	77.9 *	58.2	7	30	12	5-16
Patterson	Public	75.0 *	56.4	14	34	5	5-14
Grand mean		77.7	57.2	8	31	9	5-15
BLSD (k=100)		ns	ns	ns	1	ns	2
C.V. (%)		9.7	1.1	99	4	135	2
Two-year average, 2004, 2005.							
Bravo	OSIA	74.3 *	57.0	5	35	3	5-15
Daisy	OSIA	72.1 *	55.7	1	32	3	5-15
Hopewell	Public	71.1 *	55.3	7	35	4	5-18
Roane	Public	70.8 *	58.2	2	30	18	5-16
Patterson	Public	67.7 *	57.8	13	34	8	5-14
McCormick	Public	66.6 *	57.1	6	30	14	5-15
Grand mean		70.4	56.9	6	33	8	5-16
BLSD (k=100)		ns	ns	ns	1	ns	3
C.V. (%)		12.3	1.3	110	5	114	2
2005 results(3)							
Bravo	OSIA	63.7 *	57.7	0	30	5	5-20
Hopewell	Public	57.9 *	57.1	0	30	8	5-22
Daisy	OSIA	55.6 *	55.2	0	28	6	5-20
Roane	Public	54.8 *	58.1	0	25	35	5-22
Patterson	Public	54.1 *	58.0	0	30	15	5-19
Clark	Public	44.7 *	56.3	0	29	11	5-21
McCormick	Public	44.0 *	57.1	0	25	28	5-22
Grand mean		53.5	57.1	0	28	15	5-21
BLSD (k=100)		ns	1.1	ns	3	21	2
C.V. (%)		23.0	1.4		7	81	2

Table 3 contd. Results of late-seeded winter wheat performance trials in Tippecanoe Co., Location 2, west central Indiana.

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

(3) Conducted on the Purdue University Agronomy Center for Research and Education (ACRE), Lafayette. James J. Beaty III, superintendent. Randomized complete block design: 4 blocks. Soil type: Drummer (Chalmers) silt loam. Soil test: pH 6.3, P 13 ppm (low), K 109 ppm (medium). Fertility program: 300 lbs./acre 8-32-16 broadcast and incorporated prior to seeding. Topdressed March 2, 2005 with 275 lbs./acre of 34-0-0. Rate of seeding: 1.5 to 1.8 million live seeds per acre. Date of seeding: October 26, 2004. Date of harvest: July 6, 2005.

Table 4. Results of winter wheat performance trials in Randolph Co., Location 3, east central Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
Three-year average, 2003, 2004, 2005.							
Bravo	OSIA	97.1 *	57.3	2	37	1	5-16
Hopewell	Public	95.5 *	56.6	5	37	1	5-19
Roane	Public	94.9 *	58.8	5	34	1	5-17
NK Coker 9312		94.5 *	57.0	4	31	2	5-15
McCormick	Public	93.4 *	58.5	5	32	1	5-16
Daisy	OSIA	93.2 *	55.1	2	35	1	5-17
Patterson	Public	89.8 *	56.0	2	37	1	5-15
Grand mean		94.1	57.0	4	35	1	5-16
BLSD (k=100)		ns	1.5	ns	1	ns	2
C.V. (%)		6.8	1.2	123	5	90	2
Two-year average, 2004, 2005.							
Hopewell	Public	99.4 *	56.9	0	37	1	5-19
Bravo	OSIA	98.1 *	57.4	3	37	1	5-16
Roane	Public	98.0 *	58.6	3	35	1	5-17
Patterson	Public	94.0 *	57.2	1	38	1	5-15
McCormick	Public	91.3 *	59.0	0	32	1	5-17
Daisy	OSIA	90.9 *	55.4	0	37	1	5-17
NK Coker 9312		90.1 *	57.3	0	32	3	5-15
Grand mean		94.5	57.4	1	35	1	5-17
BLSD (k=100)		ns	1.6	ns	2	ns	2
C.V. (%)		7.3	1.3	240	5	98	2
2005 results(3)							
Excel 392		112.7 *	57.5	8	41	2	5-20
Vigoro V9513		109.6 *	57.5	0	42	3	5-21
Excel 410TW		108.2 *	57.1	0	40	3	5-20
Excel 388		107.8 *	56.2	0	42	2	5-19
Vigoro Tribute		107.4 *	59.8	0	35	7	5-21
Benton	AgriPro	107.4 *	56.8	0	37	6	5-22
Excel 211		107.4 *	56.3	3	41	2	5-18
Excel 399		106.9 *	56.3	3	39	2	5-19
Vigoro V9412		106.3 *	59.4	0	37	6	5-20
Excel 352TW		105.9 *	56.5	5	41	3	5-19
Cooper	AgriPro	105.9 *	55.8	0	37	10	5-19
Hopewell	Public	105.2 *	56.8	0	40	2	5-23
Vigoro V9512		104.3 *	55.3	5	40	3	5-18
McCormick	Public	104.1 *	58.9	0	34	3	5-20
Patterson	Public	104.0 *	56.7	3	41	3	5-17
Roane	Public	103.2 *	58.2	5	38	3	5-21

Table 4 contd. Results of winter wheat performance trials in Randolph Co., Location 3, east central Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
2005 results, continued(3)							
Excel 354TW		96.3	57.5	3	36	2	5-21
Clark	Public	91.3	56.5	3	39	5	5-19
NK Coker 9312		90.3	57.6	0	33	5	5-18
Daisy	OSIA	86.3	54.4	0	39	2	5-20
Grand mean		103.4	57.1	2	39	4	5-20
BLSD (k=100)		10.4	1.0	6	2	ns	2
C.V. (%)		6.8	1.3	165	4	108	2

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

(3) Conducted on the Davis Purdue Agricultural Center, Farmland.
Jeffrey L. Boyer, superintendent.
Randomized complete block design: 4 blocks.
Soil type: Blount silty clay loam.
Soil test: pH 5.8, P 35 ppm (high), K 148 ppm (high).
Fertility program: 135 lbs./acre 15-34-0 with 8 percent sulfur, broadcast and incorporated prior to seeding. Topdressed March 9, 2005 with 295 lbs./acre of 34-0-0.
Rates of seeding: 1.4 to 1.8 million live seeds per acre.
Date of seeding: September 29, 2004.
Date of harvest: July 8, 2005.
Note: Soybean crop residue (in 2004) contributed to planting problems. Wheat stands were not uniform in emergence, or in plant spacing in the row. Yield data for seventeen (2005) plots were calculated using Yates iterative procedure.

Table 5. Results of winter wheat performance trials in Knox Co., Location 4, south west Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
Three-year average, 2003, 2004, 2005.							
McCormick	Public	81.3 *	59.4	33	35	0	5-06
Roane	Public	80.2 *	59.7	32	37	0	5-08
Rebekah	Exsegen	75.4 *	57.4	32	37	0	5-07
Hopewell	Public	74.1 *	56.4	29	38	0	5-09
Esther	Exsegen	73.7 *	57.2	29	37	0	5-04
Sarah	Exsegen	72.6 *	54.2	20	41	0	5-10
Patterson	Public	67.0	57.9	31	39	0	5-04
Grand mean		74.9	57.5	29	38	0	5-07
BLSD (k=100)		10.4	3.3	ns	2	ns	2
C.V. (%)		8.4	1.7	37	5		3
Two-year average, 2004, 2005.							
Cooper	AgriPro	85.0 *	57.2	49	38	0	5-05
Wiley	Steyer	79.5 *	58.5	45	38	1	5-04
Judith	Exsegen	77.3 *	57.1	49	42	0	5-07
Roane	Public	76.0 *	59.1	48	38	0	5-08
McCormick	Public	75.2 *	58.9	50	35	0	5-06
Esther	Exsegen	71.2 *	56.9	43	37	0	5-05
Rebekah	Exsegen	71.0 *	56.7	48	37	0	5-07
Benton	AgriPro	69.8 *	55.2	48	37	0	5-08
Besecker	Steyer	67.0	56.9	49	41	0	5-08
Hopewell	Public	66.8	55.6	44	38	0	5-10
Sarah	Exsegen	66.0	56.0	28	41	0	5-10
Patterson	Public	57.6	57.0	46	40	1	5-06
Grand mean		71.9	57.1	46	39	0	5-07
BLSD (k=100)		16.2	1.2	ns	3	ns	3
C.V. (%)		9.3	1.7	23	5	444	4

Table 5 contd. Results of winter wheat performance trials in Knox Co., Location 4, south west Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
2005 results(3)							
Judith	Exsegen	97.9 *	60.8	0	43	0	5-12
Excel 392		94.0 *	61.7	0	44	0	5-12
Leah	Exsegen	94.0 *	60.8	0	37	0	5-10
Roane	Public	92.6 *	62.8	0	39	0	5-13
Excel 211		92.3 *	60.2	0	43	1	5-05
Vigoro V9410		92.1 *	59.5	0	41	0	5-06
Merrell	Steyer	91.8 *	61.4	0	39	0	5-10
Cooper	AgriPro	91.6 *	61.1	0	37	0	5-09
Excel 354TW		90.1	61.8	0	37	0	5-11
Vigoro V9513		89.8	60.5	0	43	0	5-10
Vigoro V9412		89.5	62.1	0	38	3	5-06
Rachel	Exsegen	88.4	60.9	0	37	0	5-06
Excel 352TW		87.6	60.2	0	41	0	5-10
Wiley	Steyer	86.1	62.3	0	38	2	5-08
Excel 399		85.9	60.1	0	42	0	5-08
Excel 388		85.4	59.8	0	41	1	5-07
Benton	AgriPro	85.3	59.3	0	37	0	5-12
Vigoro V9512		85.0	60.3	0	41	0	5-09
McCormick	Public	84.9	63.1	0	35	0	5-11
Rebekah	Exsegen	83.9	61.3	0	37	0	5-12
Besecker	Steyer	82.0	60.5	0	39	0	5-13
Esther	Exsegen	81.9	60.7	0	36	0	5-08
Sarah	Exsegen	80.9	59.3	0	40	1	5-15
Coffman	Steyer	79.7	61.7	0	39	0	5-10
Hopewell	Public	78.4	59.6	0	37	0	5-15
Patterson	Public	75.9	61.6	0	39	1	5-09
Clark	Public	75.6	60.3	0	37	1	5-07
Grand mean		86.8	60.9	0	39	0	5-10
BLSD (k=100)		6.8	0.5	ns	3	2	2
C.V. (%)		5.6	0.7		5	262	4

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

Table 5 contd. Results of winter wheat performance trials in Knox Co., Location 4, south west Indiana.

(3) Conducted on the Southwest Purdue Agricultural Center, Vincennes.
Melborn K. Lang, superintendent.
Randomized complete block design: 4 blocks.
Soil type: Ade fine sandy loam.
Soil test: pH 6.3, P 73 ppm (very high), K 133 ppm (high).
Fertility program: 175 lbs./acre 10-26-34 broadcast and incorporated prior to seeding. Topdressed March 3, 2005 with 230 lbs./acre of 34-0-0.
Rates of seeding: 1.4 to 1.6 million live seeds per acre.
Date of seeding: October 7, 2004.
Date of harvest: June 23, 2005.
Note: The 2005 wheat plots, when dormant, were under water for two weeks (January 17 to 31, 2005). Yates iterative procedure was used to restore data for twelve plots which were water damaged later in the spring of 2005.

Table 6. Results of winter wheat performance trials in Jennings Co., Location 5, south east Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
Three-year average, 2003, 2004, 2005.							
Roane	Public	95.9 *	58.2	7	36	2	5-12
Bravo	OSIA	91.4 *	56.8	2	38	1	5-11
Rebekah	Exsegen	87.9 *	56.9	3	37	3	5-10
Patterson	Public	87.8 *	57.1	5	38	5	5-10
Esther	Exsegen	85.9	56.1	2	35	3	5-09
McCormick	Public	85.8	56.8	7	34	3	5-11
Daisy	OSIA	85.7	54.5	1	36	1	5-12
Sarah	Exsegen	82.8	50.1	0	42	3	5-15
Hopewell	Public	78.4	53.4	1	38	1	5-13
Grand mean		86.8	55.5	3	37	2	5-11
BLSD (k=100)		9.8	4.2	ns	2	ns	2
C.V. (%)		7.6	1.2	136	5	108	1
Two-year average, 2004, 2005.							
Roane	Public	105.1 *	60.1	10	37	3	5-12
Bravo	OSIA	101.9 *	57.7	1	38	2	5-12
Judith	Exsegen	96.4 *	57.0	3	41	4	5-12
Patterson	Public	94.0 *	57.5	8	40	8	5-10
Esther	Exsegen	93.3 *	56.9	3	35	5	5-10
Rebekah	Exsegen	92.7 *	57.1	4	38	4	5-11
McCormick	Public	92.6 *	59.0	10	35	4	5-12
Daisy	OSIA	92.2 *	54.7	1	38	2	5-12
Sarah	Exsegen	85.8	53.8	0	43	4	5-14
Hopewell	Public	85.2	55.1	1	40	2	5-13
Grand mean		93.9	56.9	4	39	4	5-12
BLSD (k=100)		15.5	3.4	ns	2	ns	2
C.V. (%)		6.7	1.0	121	4	87	1
2005 results(3)							
Roane	Public	123.9 *	61.4	0	38	5	5-15
Judith	Exsegen	120.1 *	58.4	0	41	8	5-14
Bravo	OSIA	119.4 *	58.6	0	37	4	5-15
Vigoro V9412		117.4 *	61.0	0	37	7	5-12
Vigoro V9410		117.4 *	59.2	0	41	6	5-11
Besecker	Steyer	116.8 *	58.5	0	41	8	5-14
Merrell	Steyer	116.1 *	58.7	0	39	4	5-13
Coffman	Steyer	114.3 *	59.0	0	40	8	5-14
Vigoro V9513		112.3 *	58.3	0	42	6	5-14
Vigoro V9512		110.5 *	59.5	0	40	6	5-14
Wiley	Steyer	110.1 *	60.2	0	37	5	5-12
Patterson	Public	109.9 *	58.6	0	40	16	5-12

Table 6 contd. Results of winter wheat performance trials in Jennings Co., Location 5, south east Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
2005 results, continued(3)							
Rachel	Exsegen	109.2	59.8	0	36	10	5-12
McCormick	Public	107.7	60.1	0	35	9	5-14
Daisy	OSIA	105.8	55.5	0	38	4	5-15
Leah	Exsegen	104.9	55.6	0	34	3	5-14
Esther	Exsegen	104.7	58.3	0	35	10	5-12
Hopewell	Public	104.6	57.2	0	40	3	5-15
Rebekah	Exsegen	103.4	57.7	0	38	8	5-13
Sarah	Exsegen	98.4	52.2	0	42	8	5-16
Clark	Public	88.8	59.1	0	38	9	5-12
Grand mean		110.3	58.4	0	39	7	5-13
BLSD (k=100)		14.3	1.0	ns	2	8	1
C.V. (%)		8.4	1.3		4	61	2

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

(3) Conducted on the Southeast Purdue Agricultural Center, Butlerville.
Donald J. Biehle, superintendent.
Randomized complete block design: 4 blocks.
Soil type: Avonburg.
Soil test: pH 6.1, P 29 ppm (medium), K 152 ppm (high).
Fertility program: 524 lbs./acre 6-16-38 broadcast and incorporated prior to seeding. Topdressed March 9, 2005 with 290 lbs./acre of 34-0-0.
Rates of seeding: 1.4 to 1.8 million live seeds per acre.
Date of seeding: October 6, 2004.
Date of harvest: June 28, 2005.
Note: Data for two (2005) plots were calculated using Yates iterative procedure.

Table 7. Results of winter wheat performance trials averaged across two Indiana locations; 4) Knox, and 5) Jennings Counties.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
Three-year average, 2003, 2004, 2005.							
Roane	Public	88.1 *	59.0	20	36	1	5-10
McCormick	Public	83.6 *	58.1	20	35	1	5-08
Rebekah	Exsegen	81.6 *	57.2	17	37	1	5-08
Esther	Exsegen	79.8 *	56.6	16	36	2	5-07
Sarah	Exsegen	77.7 *	52.1	10	42	1	5-12
Patterson	Public	77.4 *	57.5	18	39	3	5-07
Hopewell	Public	76.2 *	54.9	15	38	1	5-11
Grand mean		80.6	56.5	17	38	1	5-09
BLSD (k=100)		13.2	3.9	ns	2	ns	2
C.V. (%)		7.7	1.5	50	5	141	2
Two-year average, 2004, 2005.							
Roane	Public	90.6 *	59.6	29	37	1	5-10
Judith	Exsegen	86.9 *	57.0	26	41	2	5-09
McCormick	Public	83.9 *	58.9	30	35	2	5-09
Esther	Exsegen	82.2 *	56.9	23	36	3	5-07
Rebekah	Exsegen	81.9 *	56.9	26	38	2	5-09
Hopewell	Public	76.0 *	55.3	23	39	1	5-11
Sarah	Exsegen	75.9 *	54.9	14	42	2	5-12
Patterson	Public	75.8 *	57.3	27	40	4	5-08
Grand mean		81.6	57.1	25	39	2	5-09
BLSD (k=100)		18.5	2.6	ns	3	ns	2
C.V. (%)		7.5	1.5	39	4	116	3
2005 results							
Judith	Exsegen	109.0 *	59.6	0	42	4	5-13
Roane	Public	108.3 *	62.1	0	38	3	5-14
Vigoro V9410		104.8 *	59.3	0	41	3	5-08
Merrell	Steyer	103.9 *	60.0	0	39	2	5-12
Vigoro V9412		103.5 *	61.5	0	37	5	5-09
Vigoro V9513		101.1 *	59.4	0	43	3	5-12
Besecker	Steyer	99.4 *	59.5	0	40	4	5-13
Leah	Exsegen	99.4 *	58.2	0	35	1	5-12
Rachel	Exsegen	98.8 *	60.3	0	36	5	5-09

Table 7 contd. Results of winter wheat performance trials averaged across two Indiana locations; 4) Knox, and 5) Jennings Counties.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Win. kill	Date headed
		bu./A.	lb./bu.	%	in.	%	
2005 results, continued							
Wiley	Steyer	98.1	61.2	0	37	3	5-10
Vigoro V9512		97.7	59.9	0	40	3	5-11
Coffman	Steyer	97.0	60.3	0	40	4	5-12
McCormick	Public	96.3	61.6	0	35	4	5-13
Rebekah	Exsegen	93.6	59.5	0	37	4	5-12
Esther	Exsegen	93.3	59.5	0	35	5	5-10
Patterson	Public	92.9	60.1	0	40	9	5-11
Hopewell	Public	91.5	58.4	0	38	2	5-15
Sarah	Exsegen	89.7	55.7	0	41	4	5-16
Clark	Public	82.2	59.7	0	38	5	5-10
Grand mean		97.9	59.8	0	39	4	5-12
BLSD (k=100)		10.5	2.7	ns	2	ns	3
C.V. (%)		7.4	1.0		5	83	3

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

Table 8. Results of spring oat performance trials in Porter Co., Location 1, north west Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodg-ing	Plant ht.	Date headed
		bu./A.	lb./bu.	%	in.	
Three-year average, 2003, 2004, 2005.						
Robust	Public	116.7 *	36.7	10	38	6-11
Classic	Public	115.9 *	35.1	16	40	6-07
INO 9201	Public	114.3 *	35.5	5	37	6-04
Jay	Public	111.3 *	36.7	0	37	6-07
Grand mean		114.6	36.0	8	38	6-07
BLSD (k=100)		ns	ns	ns	ns	2
C.V. (%)		8.1	2.1	137	4	2
Two-year average, 2004, 2005.						
Robust	Public	127.6 *	36.2	16	40	6-08
INO 9201	Public	127.6 *	34.8	6	37	6-01
Classic	Public	127.0 *	34.8	24	40	6-05
Jay	Public	117.9 *	35.8	1	37	6-05
Grand mean		125.0	35.4	12	39	6-05
BLSD (k=100)		ns	ns	ns	ns	3
C.V. (%)		8.8	2.5	110	5	3
2005 results(3)						
Classic	Public	113.2 *	35.2	0	37	6-05
Jay	Public	107.2 *	35.8	0	32	6-05
Robust	Public	106.6 *	37.2	0	36	6-07
Spurs	Public	106.5 *	35.8	0	34	6-03
INO 9201	Public	106.4 *	34.4	0	34	5-31
Esker	Public	103.7 *	35.5	0	36	6-05
Woodburn	Public	101.7 *	36.0	0	35	6-01
Grand mean		106.5	35.7	0	35	6-04
BLSD (k=100)		ns	1.9	ns	3	2
C.V. (%)		10.1	3.1		5	4

Table 8 contd. Results of spring oat performance trials in Porter Co., Location 1, north west Indiana.

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

(3) Conducted on the Pinney-Purdue Agricultural Center, Wanatah.
Jon D. Leuck, superintendent.
Randomized complete block design: 4 blocks.
Soil type: Runnymede silt loam.
Soil test: pH 5.9, P 43 ppm (high), K 176 ppm (high).
Fertility program: 400 lbs./acre 19-19-19 broadcast and incorporated prior to seeding.
Rate of seeding: 1.69 million live seeds or approximately 144 lbs./acre.
Date of seeding: March 30, 2005.
Date of harvest: July 11, 2005.

Table 9. Results of spring oat performance trials in Tippecanoe Co., Location 2, west central Indiana.

Entry Name (1)		Yield est.(2)	Test wt.	Lodging	Plant ht.	Date headed
		bu./A.	lb./bu.	%	in.	
Three-year average, 2003, 2004, 2005.						
Robust	Public	139.5 *	34.9	22	42	6-08
INO 9201	Public	133.9 *	34.5	30	39	6-04
Classic	Public	132.2 *	34.3	19	42	6-06
Jay	Public	131.2 *	35.6	18	38	6-07
Grand mean		134.2	34.8	22	40	6-06
BLSD (k=100)		ns	0.9	ns	3	1
C.V. (%)		7.7	1.6	47	4	3
Two-year average, 2004, 2005.						
Robust	Public	127.2 *	34.0	1	41	6-07
Classic	Public	126.4 *	33.5	14	41	6-05
INO 9201	Public	125.5 *	33.9	3	38	6-03
Jay	Public	121.5 *	34.5	2	38	6-06
Grand mean		125.2	34.0	5	40	6-05
BLSD (k=100)		ns	ns	ns	ns	1
C.V. (%)		8.8	1.9	83	4	3
2005 results(3)						
Esker	Public	159.4 *	35.2	0	39	6-03
Classic	Public	156.8 *	35.3	0	37	6-02
Robust	Public	156.3 *	35.4	0	36	6-03
Spurs	Public	154.0 *	36.0	0	35	6-01
Woodburn	Public	152.5 *	37.9	0	37	6-01
Jay	Public	150.6 *	36.0	0	35	6-02
INO 9201	Public	142.5 *	35.8	0	36	5-31
Grand mean		153.2	35.9	0	36	6-02
BLSD (k=100)		ns	0.8	ns	3	3
C.V. (%)		7.3	1.6		4	4

Table 9 contd. Results of spring oat performance trials in Tippecanoe Co., Location 2, west central Indiana.

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.

(3) Conducted on the Purdue University Agronomy Center for Research and Education (ACRE), Lafayette. James J. Beaty III, superintendent. Randomized complete block design: 4 blocks. Soil type: Drummer (Chalmers) silt loam. Soil test: pH 6.7, P 17 ppm (low), K 119 ppm (medium). Fertility program: 322 lbs./acre of 28 percent nitrogen solution, surface applied prior to seeding, to provide 90 lbs./acre of nitrogen. Rate of seeding: 1.69 million live seeds or approximately 144 lbs./acre. Date of seeding: March 18, 2005. Date of harvest: July 11, 2005.

Table 10. Results of spring oat performance trials averaged across two Indiana locations; 1) Porter, and 2) Tippecanoe Counties.

Entry Name (1)		Yield est.(2)	Test wt.	Lodg-ing	Plant ht.	Date headed
		bu./A.	lb./bu.	%	in.	
Three-year average, 2003, 2004, 2005.						
Robust	Public	128.1 *	35.8	16	40	6-10
INO 9201	Public	124.1 *	35.0	18	38	6-04
Classic	Public	124.0 *	34.7	18	41	6-07
Jay	Public	121.3 *	36.2	9	38	6-07
Grand mean		124.4	35.4	15	39	6-07
BLSD (k=100)		ns	0.7	ns	1	3
C.V. (%)		7.9	1.9	69	4	3
Two-year average, 2004, 2005.						
Robust	Public	127.4 *	35.1	8	40	6-08
Classic	Public	126.7 *	34.1	19	40	6-05
INO 9201	Public	126.5 *	34.4	4	38	6-02
Jay	Public	119.7 *	35.1	1	37	6-05
Grand mean		125.1	34.7	8	39	6-05
BLSD (k=100)		ns	ns	ns	ns	4
C.V. (%)		8.8	2.2	120	4	3
2005 results						
Classic	Public	135.0 *	35.2	0	37	6-04
Esker	Public	131.6 *	35.3	0	37	6-04
Robust	Public	131.4 *	36.3	0	36	6-05
Spurs	Public	130.2 *	35.9	0	34	6-02
Jay	Public	128.9 *	35.9	0	34	6-03
Woodburn	Public	127.1 *	37.0	0	36	6-01
INO 9201	Public	124.5 *	35.1	0	35	5-31
Grand mean		129.8	35.8	0	36	6-03
BLSD (k=100)		ns	ns	ns	2	3
C.V. (%)		8.5	2.4		5	4

Table 10 contd. Results of spring oat performance trials averaged across two Indiana locations; 1) Porter, and 2) Tippecanoe Counties.

(1) Public entries were developed by Agricultural Experiment Stations (Indiana Agricultural Research Programs) or in cooperation with the Agricultural Research Service of the USDA. Other names are company or brand names, generally associated in the trade, with variety, brand, hybrid or blend names.

(2) Yield estimates followed by an asterisk (*) are not, statistically, significantly different from the highest yield in the sub-table.