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# Agronomy Facts No. 19

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(Revised July, 2009)

## 2009 MARYLAND WHEAT & BARLEY VARIETY PERFORMANCE TRIALS

<http://www.mdcrops.umd.edu>

Wheat and barley cultivar trials were conducted by the Maryland Agricultural Experiment Station and the Department of Plant Science and Landscape Architecture across Maryland in the 2008/2009 season at the following five locations : (1) Allen, in Wicomico County (2) Lower Eastern Shore Research and Education Center's (REC) Poplar Hill Facility near Quantico in Wicomico County; (3) Wye REC at Queenstown in Queen Anne's County; (4) Central Maryland REC's Clarksville Facility in Howard County; and (5) Western Maryland REC near Keedysville in Washington County (practices at each location are listed in Table 1).

Entries that are generally available to Maryland producers and that are commonly grown in the state are selected each year for the tests. In addition, new varieties, commercial brands, and advanced breeding lines are included in the tests to compare their performance to that of known varieties. Forty-three wheat entries and eleven barley entries made up the 2008 tests. Hull-less barley entries were also included in the barley trials. Table 2 lists the suppliers and seed treatments applied to each entry. The following characteristics were evaluated in these trials: grain yield (adjusted to 13.5% moisture), test weight, moisture content at harvest, heading date, lodging, plant height, wheat powdery mildew (scored on a 0-9 scale). Lodging was based on a score of 0 - 9 where 0=no lodging and 9=flat. Heading date was determined when approximately 50% of the small grain heads had cleared the boot. Plant height did not include the length of the awns. Leaf rust data was kindly provided by Dr. Arvydas Grybauskas.

Wheat and barley entries were planted (both for conventional tillage and no-till) at all locations in seven-row plots 16 feet in length and later trimmed to 10 feet in randomized blocks with three replications per entry. Both wheat and barley were planted in 6 inch rows. Wheat was seeded at a rate of 18 seeds per foot of row, which represents a population of approximately 1.3 million plants per acre based on 90% germination. For no-till studies, a rate of 22 seeds per foot of row was used (approximately 1.7 million plants per acre based on 90% germination). Seeding rate for barley was 96 lb/acre. Plots were mechanically harvested using a small plot combine (Wintersteiger Seedmech Nurserymaster Elite). Plot weight, test weight, and moisture content data of the wheat trials were obtained with a HarvestMaster HM-1000b attached to the plot combine. Other location-specific management factors are summarized in Table 1.

### PRODUCTION YEAR

Planting conditions were fairly favorable at most locations in the fall of 2008. December 2008 and January 2009 were cooler than average. March and April were average. May and June were wetter than usual in most of the state and Fusarium head scab was present at most locations this year. Powdery mildew was present during the spring of 2009 and was scored at most locations. Leaf rust and stripe rust were practically absent this year. Grain yield of both barley and wheat entries were average to low at most locations because of the cold winter at Keedysville and wet spring statewide. Test weights were lower than average. Fusarium head blight was significant across the state, especially at Queenstown, Poplar Hill, Allen and Keedysville.

## RESULTS

Wheat and barley performance data are summarized in the data tables, posted separately. There are tables summarizing the individual test locations for both small grain crops. In addition, there are statewide summary tables and a relative yield table. A two and three-year summary table for selected entries of each crop is also included (see Index to Tables).

Data were statistically analyzed to determine if differences existed between varieties at each location. At the bottom of each table a mean, an LSD, and a CV are reported. Least significant differences (LSD) were calculated at the 5 % probability level. “NS” in the tables indicates that no statistically significant differences were observed for that character at the 5% probability level. The coefficient of variation (CV) is a measure of field variability in relation to the mean. CV’s below 10% are an indication that the precision of the test is good in distinguishing differences between varieties. A CV above 10% indicates other factors than varietal differences are causing variability. These factors can include fertility management, different soil types within the study, low spots in the field, etc.

As an aid to assess the performance of individual varieties in the test, relative yield values were calculated. Relative yield value of a variety is the percentage of the mean yield for all varieties at a location. A variety with a relative yield that is consistently greater than 100 is a variety that consistently yields higher than the mean yield of all of the varieties at that location. In these tables, the relative yields of those varieties with an asterisk were not statistically different from the highest yielding variety at that location.

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## ACKNOWLEDGMENTS

The Small Grains Breeding Program would like to recognize the farm staff of the Maryland Agricultural Experiment Stations and Mr. Clifford Cooper (Table 1) for their assistance with land preparation, plot management, harvest, and equipment repair. We would also like to thank the **Maryland Crop Improvement Association** and the **Maryland Grain Producers Utilization Board** for their generous financial contributions to our breeding and testing program. We also wish to recognize the greenhouse staff at the University of Maryland (Mr. Shaun Faulkner, Ms. Betty Morgavan , Mr. Sydney Wallace) for all of their assistance during the winter crossing months , Emma Shirley, Jing Kang, Lydia Cardwell, Patrick DiBello, and Raquel Brown, for their hard work in the greenhouse as well as during harvest and processing of seed, Dr. Robert Kratochvil and Dr. Arvydas Grybauskas for their helpful suggestions and data.

The cooperation and support offered by commercial seed companies, state crop improvement associations, and several University Experiment Stations in supplying seed and information about varieties are greatly acknowledged. Finally, a special note of appreciation is also extended to the County Extension Educators who disseminate this information.

**Agronomy Facts No. 19 prepared by: Dr. José M. Costa and Mr. Aaron Cooper**

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**Table 1. 2008/2009 Wheat and Barley Variety Test Plot Information****1. Allen. Clifford Cooper's farm**

Wicomico County- Allen, MD.

Planting dates: 10/24/08 (wheat and barley). Harvest date: 6/9/09 (barley); 6/16/09 (wheat)

Soil Type: Matapeake fine sandy loam. pH=6.3. Previous crop: soybeans.

No-till used.

Fertilizer: Fall: 345# 10-15-27-18S on 10/23/08. Spring at greenup: 194# 21-0-0-24S as Ammonium Sulfate on 2/15/09.

Spring at GS 6: 60 lbs N as 30-0-0 on 3/25/09

Herbicide: Harmony Xtra 0.75oz on 3/25/09.

**2. Lower Eastern Shore Research and Education Center (LESREC) - Poplar Hill Facility**

Wicomico County - Quantico, MD

Planting dates: 10/24/08 (wheat and barley). Harvest date: 6/9/09 (barley); 6/16/09 (wheat conventional and wheat no-till)

Soil Type: Matapex silt loam. pH=6.2. Previous crop: corn.

Fertilizer: Fall: 30# N, 20# P, 80# K, 24# S. Spring at greenup: 40# N as 30% UAN. Spring at GS 6: 60# N as 30% UAN.

Herbicide on 3/6/09: Harmony Xtra 0.75 oz

Insecticide at heading: Warrior 3.5 oz

Farm Staff: Ron Mulford, Fred Senkbeil, and Mike Senkbeil.

**3. Wye Research and Education Center (WREC)**

Queen Anne's County - Queenstown, MD

Planting date: 10/20/08 (conventional wheat and barley). 11/2/08 (Wheat no-till). Harvest date: 6/15/09 (barley); 6/25/09 (wheat conventional); 6/26/09 (Wheat no-till).

Soil Type: Matapeake silt loam. pH = 6.3 (conventional wheat), pH=6.3 (conventional barley), pH= 5.8 (no-till), Previous crop: corn (conventional), soybeans (no-till).

Fertilizer: Fall: 20# N (conventional) on 10/7/08. Spring:40#N as 50/50 water/30% on 3/11/09 (conventional wheat), 60# N as 50/50 water/30%(conventional barley and no-till wheat)on 3/10/09. 40#N as 50/50 water/30% on 4/9/09 (wheat)

Herbicide: Harmony (conventional till) on 3/13/09 and (no-till) on 4/9/09.

Farm Staff: Mark Sultenfuss, Reese Stafford, and Joe Streett.

**4. Central Maryland Research and Education Center (CMREC)-Clarksville Facility**

Howard County - Clarksville, MD

Planting dates: 10/2/08 (wheat and barley). Harvest dates: 6/16/09 (barley); 6/29/09 (wheat)

Soil type: Chester Gravely. pH= 6.7. Previous crop: corn. Conventional tillage.

Fertilizer: Fall: 200# 7-18-36. Spring: 60# N as 30-0-0 UAN

Herbicide: Harmony Xtra 0.6 oz/A

Farm Staff: Dave Justice, and Tim Ridgley Sr.

**5. Western Maryland Research and Education Center (WREC) - Keedysville Facility**

Washington County - Keedysville, MD

Planting dates: 10/1/08 (wheat and barley). Harvest dates: 6/29/09 (barley). 6/29/09 (wheat).

Soil Type: Hagerstown silt loam. pH=6.5. Previous crop: corn. Minimum tillage.

Fertilizer: Fall: none. Spring: wheat and barley: 32lbs N as 30% UAN on 3-13-09. 32lbs N as 30% UAN on 4-24-09.

Herbicide: Harmony Xtra XP 0.6oz.

Farm Staff: Tim Ellis and Douglas Price

**Table 2. Sources of Winter Wheat, and Barley Entries Tested in Maryland in the 2008/2009 season.**

<b>Supplier/Address/Local Rep.</b>	<b>Brand</b>	<b>Varieties and Seed Treatments*</b>
AgriPro Coker; P.O. Box 1240, Winterville, NC 28590; Phil Farmer (910)452-5597; phil.farmer@syngenta.com	AgriPro Coker	Branson, Coker 9184, Coker 9553, Cooper, Oakes (treated with D)
Growmark FS; 308 NE Front St., Milford, DE 19963; Duane Orr 410-960-7447; dorr@growmarkfs.com	FS	621, 627, 950 (treated with D)
Pioneer Hi-Bred Intl., Inc.; 14171 Carole Dr., Bloomington, IL 61704; Bill McCollum (302) 584-5428; bill.mccollum@pioneer.com	Pioneer	26R15, 25R56, 25R62 (treated with D/A)
Seedway; 5901 Vera Cruz, Emmaus, PA 18049; Jerry Davis (610)967-4131; JDavis@Seedway.com	Seedway	SW 27, SW 55, SB151 (treated with RT)
Southern States Coop.; P.O. Box 26234, Richmond, VA 23260; Jerry Hevner (302) 629-7991; Jerry.Hevner@SSCOOP.COM	SS	SS 520, SS 560, MPV-57, SS 8302, SS 8309, SS 8404 (treated with RT), SS 548 (treated with DXT), SS 8641 (treated with R)
Mid-Atlantic Seeds, 2004 St Charles Way #163E, York, PA 17402; (717) 852-8894; MAS-office@comcast.net	MAS	MAS-1, MAS-2, MAS-3, MAS-4 treated with RT
UniSouth Genetics, Inc.; 2640-C Nolensville RD, Nashville, TN 37211; Kevin Anderson (410) 651-2706; wimberlyfarm@earthlink.net	USG	3209, 3342, 3592, 3665, 3910, 3860 (treated with DXT)
Renwood Farms, Inc., 17303 Sandy Point Rd., Charles City, VA 23260, David Hula (804) 829-6345	Renwood	3260 (treated with RT)
Ohio Agric. Exp. Stn.	-----	Becker (RT) (Powdery mildew susceptible check)
University of Georgia, GA Station, 1109 Experiment St., Griffin, GA 30223; Jerry Johnson (770) 228-7321; jjohnson@griffin.uga.edu	-----	AGS2035, Baldwin, GA breeding lines (treated with RT)
Maryland Agric. Exp. Stn.	-----	Chesapeake and MD wheat breeding lines (treated with RT) MD barley breeding Lines (treated with RT)
VPI & SU/VCIA/EVAREC; 2229 Menokin RD, Warsaw, VA 22572; Mark Vaughn (804) 333-3485; mvaughn@vt.edu	-----	Jamestown, McCormick, Sisson, Merl, VA Breeding Lines (treated with RT) Eve, Thoroughbred barley and VA barley breeding lines (treated with RT)

\*Seed treatment codes in parentheses after each entry are as follows: **R**= Raxil; **RT** = Raxil/Thiram; **D** = Dividend; **D/A** = Dividend/Apron; **DXT** = Dividend Extreme.