Additional information on Dr. P.S. Baenziger's projects in 2007 can be found at http://agronomy.unl.ecu/ grain/ WHTANN0732708.PDF.

Personnel.

Satyanarayana Tatineni joined the USDA–ARS group as a molecular virologist. Mr. Javed Sidiqi successfully completed his M.S. degree. Mr. Zakaria Aj-Alouni successfully completed his Ph.D. degree. Dr. Liakat Ali completed his postdoctoral assignment and accepted a position with the University of Arkansas. We welcome Mr. Richard Little to his new position as Organic Wheat Breeding Project Coordinator. We also welcome Ms. Somrudee Onto and Mr. Ali Bakhsh as new graduate students to our program.

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VIRGINIA

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2007 Wheat Production in the Commonwealth of Virginia.

W.E. Thomason, C.A. Griffey, and J. E. Seago

Growing Conditions. Planting conditions for the 2006–07 small grain crop ranged from acceptable soil moisture to excessively wet in some southeastern counties. Forty-two percent of the small grain crop was planted by 29 October, which was exactly the five year mean. Rain and unseasonable warm temperatures in early winter favored small grain development, especially helping later planted stands. Average temperatures in January were more than seven degrees above the long- term average for that time of year and resulted in a boost in small grain growth (Fig 1). Late winter brought unseasonable cool temperatures and dry weather with February and March rainfall at 70 percent of normal (Fig. 2). Cold damage and the dry spring resulted in the wheat crop being rated 54 percent good and 27 percent fair.

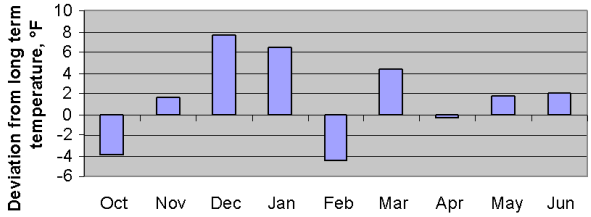

Fig. 1. Temperature deviation from long-term mean.

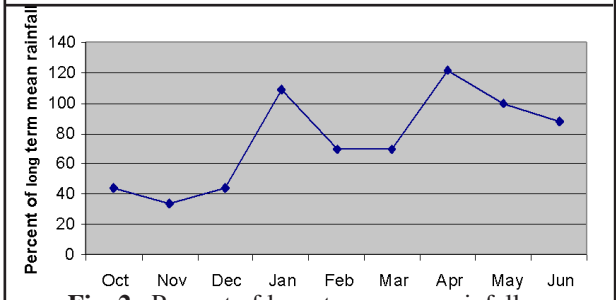

Fig. 2. Percent of long-term mean rainfall.

The 'Easter Freeze' resulted in some damage to wheat and especially barley fields, but the Virginia crop overall fared much better than many of our neighbors. More damage was reported in early heading cultivars and location, even within the field, seemed to have a major impact. Dry conditions at harvest time facilitated a timely harvest with USDA reporting wheat harvest 12 percent ahead of normal on 1 July. These warm and dry conditions resulted in slightly smaller kernels in most instances. Overall quality of the 2007 crop was good. Test weight averaged 0.27 lb/bu more than the 2006 crop, largely because dry conditions allowed continued harvest without weathering. Grain protein was 0.11 percent higher in 2007 compared to 2006, also due to warm and dry conditions during grain fill.

Disease and insect incidence and severity. Stripe rust, was only found at one of the seven Official Variety Test sites in 2007. Initial infection foci were observed at Orange, VA in plots of 'Sisson' wheat, carrying resistance gene *Yr*9, indicating that the race likely was PST100. Powdery mildew incidence again was lower than usual for the fourth consecutive year in the Eastern Shore and Coastal Plain region. Leaf rust infection was moderate on susceptible cultivars grown in research yield trials at Holland, VA, and high at Warsaw and Painter, VA. Cultivars such as Sisson and USG3209 having gene *Lr*26 and McCormick having gene *Lr*24 were susceptible to leaf rust. Race surveys conducted USDA–ARS Cereal Disease Lab on 18 samples from six regions in Virginia indicate that race MFGJH (virulence for genes *Lr1*, *3*, *10*, *11*, *14a*, *24*, *26*, *28*, *42*) was most common at Warsaw (northeast), Holland (southeast) and Painter (eastern shore) VA. Race TNRJK (virulence for genes *Lr1*, *2a*, *2c*, *3*, *3ka*, *9*, *10*, *11*, *14a*, *24*, *28*, *30*, *41*, *42*) also was present at Painter, VA. Race TDBGG (virulence for genes *Lr1*, *2a*, *2c*, *3*, *10*, *24*, *28*) was present at Blacksburg (southwestern) VA. Race MCDSB (virulence for genes *Lr1*, *3*, *10*, *14a*, *17*, *26*, *B*) was present at Blackstone (southern Piedmont) and race MCTSB (virulence for genes *Lr1*, *3*, *3ka*, *10*, *11*, *14a*, *17*, *26*, *30*, *B*) was common at Orange (northern Piedmont) VA. The incidence of FHB was low in 2007 and DON toxin levels were predominantly below 1 ppm. Barley yellow dwarf virus infection was low to moderate at two test sites (Warsaw and Blacksburg, VA) and moderate to high at two other sites (Orange and Blackstone, VA).

Production. Virginia wheat producers planted on 230,000 acres (93,150 ha) in 2006–07, up 40,000 acres (16,200 ha) from the previous year and 22,000 acres (8,910 ha) more than the 2000–06 mean. Harvested area in 2006–07 was estimated at 205,000 acres (83,025 ha), up 30 percent over the previous two seasons. Statewide average yield was 64 bu/ac (4,300 kg/ha), four bu/acre (269 kg/ha) higher than the 5-year average yield of 60 bu/acre (4,031 kg/ha). Overall wheat production was 13.1 x 10^6 bushels. Wheat acreage is estimated to have increased an additional 50,000 acres in 2007–08 due to stronger prices.

State cultivar tests. A total of 90 entries were evaluated in 6 trials at six locations across the Commonwealth in 2007. No-till tests planted into corn stubble also were conducted at Warsaw and Holland, VA. Included in this total were 35 released cultivars and 55 experimental lines (42 developed at Virginia Tech). Average grain yields ranged from 70 to 92 bu/acre (4,703 to 6,182 kg/ha) with an over location test average of 81 bu/acre (5,442 kg/ha). Wheat cultivars with yields ranging from 84 to 92 bu/acre (5,644 to 6,182 kg/ha) and significantly above the test average included USG 3665, Branson, USG 3555, Tribute, and USG 3209. Twenty experimental lines also produced yields within a similar range that was significantly higher than the eight-location test average. Average test weights of wheat lines ranged from 57.5 lb/bu (740 kg/m^3) to 62.6 lb/bu (806 kg/m^3) with a test average of 60.0 lb/bu (772 kg/m^3).

2007 Virginia Small Grain Yield Contest results. There were six entries grown in four counties in the 2007 Virginia wheat yield contests. Five of the entries were grown no-till and one conventional till. The three highest yields came from producers in different counties and were obtained with different cultivars. Results are presented in Table 1.

Table 1. 2007 Virginia Small Grain Yield Contest results.

Place	Farm	Yield County	Planting (bu/acre)	date	Cultivar
1	John N Mills & Sons	Hanover Co.	107.41	10/12/2006	Vigoro 9510
2	Hampstead Farm	Middlesex Co.	106.49	10/25/2006	SS MVP 57
3	Flaggy Run Farms, LLC	So. Hampton Co.	98.36	10/16/2006	SS 520
Additional entries:					
	Grainfield Farm	Hanover Co.	97.86	10/14/2006	Roane
	Corbin Hall Farm	Middlesex Co.	93.247	11/3/1006	Pioneer 26R31
	Laurel Springs Farm	Westmoreland Co.	80.30	10/22/2006	Tribute

Three unusual arthropods in small grains in 2007–08

Ames Herbert, Extension Entomologist.

The 2007–08 small grain season brought three unusual insect/arthropod problems to wheat in Virginia and northeast North Carolina. Winter grain mite, *Penthaleus major* (Dugès), began showing up in large numbers in wheat fields on our Eastern Shore counties in December. Populations were large enough, for the first time that we know of, to damage and even kill plants in large areas. After some hustling, we were able to connect growers with relevant educational materials and management got underway. Very soon after the first reports from the 'Shore', we started receiving calls from northeast North Carolina, then counties to our west, then north of us from the Middle Peninsula region, and eventually from our Northern Neck region. By March, these mites were infesting fields throughout the majority of our small grain production area. Interestingly, I also got calls from central North Carolina and from as far away as Alabama. We are currently surveying to determine the extent of the mite infestation, but based on what we have been hearing, several thousands of acres were infested, and many hundreds were treated. There is very little information about this mite in terms of thresholds and management in wheat, and even less to help explain the widespread problem we encountered this season.

The second unusual insect problem was what I termed 'spring-only' aphid infestations. Although it is not uncommon to see a few aphids in wheat in the spring months (a few per row foot), this year infestations were large, sometimes exceeding 200 to 300 per row foot, and mostly comprised of the species, bird cherry-oat aphid. The location of these infestations was also unusual, being mostly in the southeastern part of the state, rather than in the Middle Peninsula and northeast counties. Our research from the late 1980s and early 1990s showed that even large populations of these 'Spring-only' aphid infestations did not present a threat to grain yields, as they were not associated with the transmission of barley yellow dwarf, the primary aphid-related agent responsible for decreasing grain quality and yield. But because they were not used to seeing them, and because of the high wheat prices, many growers took the opportunity to tank-mix insecticides with spring fungicide applications. Again, like with the mites, we do not know what combination of factors lead to this unusual 'spring-only' aphid outbreak.

The third, and maybe related unusual wheat insect problem was Hessian fly. I say 'maybe related' because indeed, all of these pest problems may somehow be related to the generally warmer winters, drier summers, and increase in crop and cover-crop residue in fields because of the increase in reduced tillage practices. This year Hessian fly populations have been very large and long lasting in some fields, and have been giving headaches to growers and crop consultants, especially in northeast North Carolina. Because Hessian fly is so unusual in our area of the country, we have not had the opportunity to develop good data-based management recommendations, which of course opens the door to speculation, desperation treatments and seat-of-the-pants recommendations.

Are these pest problems going to recur, or were they flukes, not to seen for another bunch of years? Now that we have seen them, we will be on the lookout next season and, hopefully, be in a better position to react with some timely field research efforts. It will take coördination across state lines and disciplines, and even so, at least a few seasons to develop good management strategies.

On the positive side, cereal leaf beetle populations were extremely low this year, with almost no fields even coming close to developing economic thresholds. Was this weather related too? Or have we gradually reduced cereal leaf beetle numbers with annual pyrethroid sprays in wheat? The latter could be possible since cereal leaf beetle undergoes a single generation each year, and only infests small grains. Killing that one generation in wheat (they are very susceptible to pyrethroid insecticides) greatly limits the number that are carried over to the next season. Incidence of barley yellow dwarf was also very low. We have three field trials across the eastern side of the state evaluating various aphid/BYD control treatments and virus incidence, even in the untreated controls, never exceeded 2% of the total area (compared with 30% in heavy pressure years). This does fit a known pattern, in that incidence of BYD is typically low in years following dry summers, which we certainly had in 2007. Dry summers limit the number and growth of the summer weed aphid hosts, which reduces summer build up and the number of aphids that move into grain fields in the fall.

Maybe the story behind the story is that weather is a critical factor in influencing pest populations. If weather patterns are changing, pest problems may also make some shifts in terms of both the species we find, and the infestation levels. Only time will tell.

Release of 'Jamestown' soft red winter wheat.

The SRWW cultivar **Jamestown** was derived from the cross 'Roane/Pioneer Brand 2691'. The cultivar was approved for release by the Virginia Agricultural Experiment Station in spring 2007, and certified seed will be available beginning in autumn 2009. Jamestown is a distinctly early heading, high yielding, short stature, awned, SRWW cultivar. Jamestown is widely adapted and provides producers in the mid-South, Deep South, and throughout the mid-Atlantic region with a distinctly early maturing, disease and pest resistant cultivar. Jamestown is notably resistant to Hessian fly, leaf rust, stripe rust, powdery mildew, and fusarium head blight.

On the basis of milling and baking quality evaluations over four crop years (2003–06), Jamestown tends to have higher break flour yields (30.5% versus 28.3%) and slightly softer texture (higher softness equivalent score 57.4% versus 54.1%) than those of USG 3209. Straight grade flour yields of Jamestown (71.7%) have been slightly higher than those of USG 3209 (71.1%). On average, Jamestown has higher flour protein concentration (8.92% versus 8.66%) and gluten strength (lactic acid retention value of 113% versus 107%) than those of USG 3209 and, therefore, may be suitable for use in making crackers and other products requiring moderate gluten strength. Overall, Jamestown has better baking quality than that of USG 3209 on the basis of lower values for sucrose retention capacity (93.8% versus 104%) and larger cookie diameters (17.0 cm versus 16.8 cm).

Release of 'USG 3555' soft red winter wheat.

USG 3555 is a high yielding, moderately-early heading, short stature, awnleted, SRWW. Derived from the cross 'VA94-52-60/Pioneer Brand 2643//USG 3209', it was released by the Virginia Agricultural Experiment Station in spring 2007, and certified seed will be available beginning in autumn 2008. USG 3555 is widely adapted and has potential for production in the mid-South, Deep South, and throughout the mid-Atlantic region. USG 3555 notably possesses a high level of resistance to powdery mildew, stripe rust, and stem rust, but is susceptible to Hessian fly.

On the basis of milling and baking quality data for four crop years (2003–06), USG 3555 tends to have higher break flour yields and slightly softer texture than those of USG 3209. Flour yields of USG 3555 have been similar to those of USG 3209. On average, USG 3555 has higher grain protein concentration and stronger gluten strength than USG 3209. Overall, USG 3555 has better pastry baking quality on the basis of lower values for sucrose retention capacity and larger cookie diameters than those of USG 3209 and also has good cake baking qualities.

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