cated experiments are under progress to comprehensively compare the two pretreatments in the three cultivars. We hope to establish DH production methods on these and other major Nebraskan winter wheat cultivars so that this method will be a beneficial tool in our wheat breeding efforts.

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VIRGINIA

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2011 Wheat Production in the Commonwealth of Virginia.

Growing conditions. Following an extremely dry summer and corresponding low yields in most of the Commonwealth in 2010, small grain growers experienced a generally drier and warm early start to planting (Fig. 1 and Fig. 2, p. 245). Many farmers were able to get an early start on wheat planting, since the harvest season for corn and soybeans was abbreviated greatly. By 20 September, about 9% of the wheat crop was seeded, compared to the average of 4%. By 20 October, most areas had received enough rainfall so that 65% of the state was rated adequate for topsoil moisture. The trend toward early seeding and early emergence continued with 46% of intended acreage reported as already planted, and 18% of acres emerged compared with the 5-year average of 8% by this date. The end of the first week of November showed continued cool and relatively wet weather throughout much of the state. Still growers managed to have 77% of acres planted. Conditions for early season growth

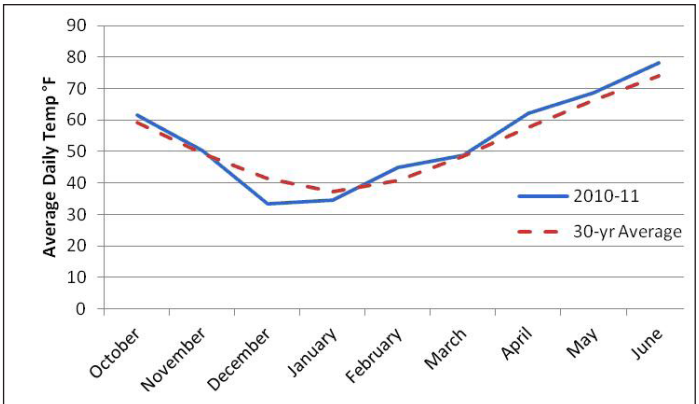

Fig. 1. 2010–11 and 30-yr mean monthly average temperatures in the Commonwealth of Virginia.

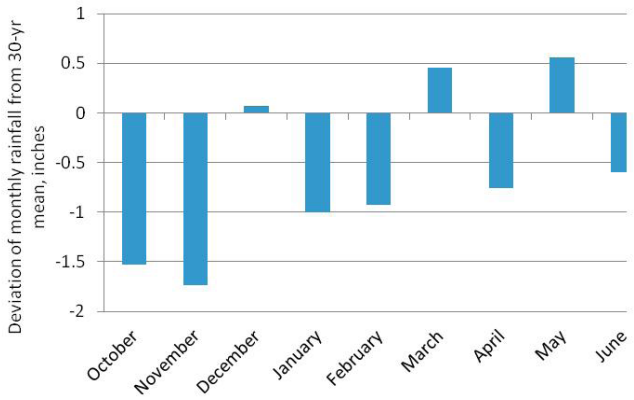

Fig. 2. Deviation of 2010–11 season rainfall from the 30-yr mean by month in the Commonwealth of Virginia.

were favorable, especially for the early planted wheat and the Virginia Agricultural Statistics Service reported that 81% of wheat had emerged compared to the 5-year average of 53%. Mid-winter was relatively dry and cold with little snowfall, which resulted in more winter injury to some small grain fields but did allow producers to access their fields. Rain in March was welcome and helped improve condition of wheat throughout the state.

By early April, wheat was rated at greater than 80% good or excellent. Crop condition remained quite good in most locations in late April however some areas were beginning to feel the effects of dry weather. By the end of the first week of May, 64% of the wheat crop was headed, compared to 41%, the 5-year average for this timeframe. The wheat harvest was estimated to be 30% finished by 12 June. This, combined with a relatively dry grain-fill period and harvest season, allowed producers to harvest a large wheat crop.

Disease and insect incidence and severity. Entries in Virginia's 2011 state wheat variety trials were rated (0 = no infection to 9 = severe infection) for disease severity in five environments at four locations. Mean disease severity scores for powdery mildew (*Blumeria graminis*) varied from 1 to 3 in four environments. The 87 entries in the 2011 trial had powdery mildew ratings that varied from 0 to 7 at the Northern Piedmont, Eastern Virginia, and Eastern Shore Agricultural Research and Extension Center (AREC) test sites. Mean test scores for leaf rust (*Puccinia triticina*) varied from 2 to 4 in four environments. Wheat entries received mean ratings from 0 to 9 in the Eastern Virginia (Warsaw) no-till test and from 0 to 8 in the Eastern Virginia conventional test, the Eastern Shore (Painter) test, and the Southwest Virginia (Blacksburg) test. Cultivars having only genes *Lr24* or *Lr26* were susceptible to leaf rust at most locations, and cultivars having only gene *Lr9* or this gene combined with *Lr24* were susceptible at Blacksburg. Race surveys conducted by the USDA–ARS Cereal Disease Lab on 27 isolates from four regions in Virginia indentified 11 races of leaf rust. Six races having virulence for gene *Lr26* but avirulent to gene *Lr24* were identified and included MCTNB and TCTBG (Painter, VA); MCTQB, TCJSB, and TCRKG (Warsaw, VA); and TCJSG (Painter and Warsaw). Four races identified with virulence for genes *Lr24* and *Lr26* include TFRJG (Painter), MFDSB (Warsaw), and MFGJG and MFRJG (Painter and Warsaw). Race TNRJJ having virulence for genes *Lr9* and *Lr24* was identified only at Blacksburg, VA. Stripe rust (*Puccinia striiformis*), was found only at Warsaw, VA, in 2011 and a sample was sent to Dr. Xianming Chen at USDA–ARS in Pullman, WA, for race identification. Two races were identified including PSTv34 having virulence for genes *Yr6*, *Yr7*, *Yr8*, *Yr9*, *Yr17*, *Yr27*, *Yr44*, *YrTr1*, and *YrExp2*, and PSTv37 with virulence for genes *Yr6*, *Yr7*, *Yr8*, *Yr9*, *Yr17*, *Yr27*, *Yr43*, *Yr44*, *YrTr1*, and *YrExp2*. Barley/cereal yellow dwarf virus infection was moderate at Blacksburg (0–2) and Blackstone (1–4).

Production. According to the United States Department of Agriculture's National Agriculture Statistical Service (http://www.nass.usda.gov/Statistics_by_State/Virginia/index.asp), in autumn 2010, Virginia wheat growers planted 270,000 acres (109,350 ha). In the spring of 2011 an estimated 250,000 acres (101,250 ha) was harvested in the state of Virginia. The average yield was 71 bu/acre (4,770 kg/ha), which was a 20 bu/acre (1,344 kg/ha) increase over that of the previous year. In all, Virginia growers produced 17.7 x 10^6 bushels (481,191 metric tons), which was a significant increase from the previous year.

State cultivar tests. In the 2010–11 tests, there were a total of 87 entries planted in eight environments across Virginia (http://www.grains.cses.vt.edu/). The test included 51 cultivars and 36 experimental lines. No-till tests, planted after corn, were conducted at Warsaw and Holland, VA. Mean grain yields varied from 72 bu/ac (4838 kg/ha) at Holland, VA to 105 bu/acre (7,055 kg/ha) in the no-till test at Warsaw, VA, with a mean yield over all eight environments of 91 bu/acre (6,094 kg/ha). Commercial cultivars Featherstone VA258, W1566, Progeny 870, Dyna-Gro 9171, SS 520, Pioneer Brand 26R10, Shirley, SS 8340, USG 3438, 12V51, Branson, 5187J, Progeny 125, and Merl all produced yields (94–99 bu/acre, 6,316–6,652 kg/ha) that were significantly higher than the overall trial average. Average grain yields among the 87 entries ranged from 74 bu/acre (4,972 kg/ha) for the long-term check cultivar Massey to 99 bu/acre (6,652 kg/ha) for Featherstone VA258. Test weight means among the eight trials varied from 56.3 lb/bu (72.5 kg/hl) in the Shenandoah Valley test to 62.0 lb/bu (79.8 kg/hl) in the Warsaw no-till test. The average test weights of the 87 entries over all eight

environments ranged from 56.4 lb/bu (72.6 kg/hl) to 61.7 lb/bu (79.4 kg/hl) with an overall trial average of 59.4 lb/bu (76.4 kg/hl).

Other tests. In 2010–11, tests were initiated by Dr. Maria Balota at the Tidewater AREC in Holland, VA, to evaluate the response of cultivars to moisture stress under rain exclusion shelters. Based on recorded weather at Holland, spring rainfall has diminished in the last five years compared with the 70-year average with possible effects on crops yields including wheat. To know which cultivars are the most drought tolerant and the mechanisms governing this tolerance, six wheat cultivars were planted in replicated trials under two rain exclusion shelters. One shelter was kept under moisture stress, no rain or irrigation from two weeks after flower until physiological maturity, and one was irrigated twice with one inch of water every time. The irrigated plots also received rainfall, as the shelter was left uncovered. The cultivars were Jackson, Merl, Pioneer 2580, Roane, Shirley, and SS 5205. Under moisture stress, yields ranged from 56 to 70 bu/ac (4,240–5,190 kg/ha). With approximately 2.5 inches of irrigation and rainfall from two weeks after flower to maturity, yields were from 63 to 76 bu/acre (4,742–5,688 kg/ha). Shirley was the highest yielding cultivar (72.3 bu/acre; 5,439 kg/ha), followed by SS 5205 (66.4 bu/acre; 4,996 kg/ha), Roane (64 bu/acre; 4,842 kg/ha), Pioneer 2580 (63.3 bu/acre; 4,759 kg/ha), Jackson (61.8 bu/acre; 4,648 kg-ha), and Merl (59.7 bu/acre; 4,491 kg/ha). Under moisture stress, higher yields were associated with increased spike and straw weight. Under irrigation, higher yields were related to a higher number of spikelets per spike.

2011 Virginia Wheat Yield Contest Results. The 2011 contest was conducted statewide and the results are presented (Table 1). Top yields were 58.5 to 47.0 bu/acre (3,191–3,973 kg/ha) higher than the 2011 state average yield. All growers planted their wheat no-till following corn except for Frank Hula, whose wheat crop was planted no-till following full season soybean. All growers planted fungicide treated seed at rates of 24 to 32 seed/row foot in 7.5-inch rows, applied herbicides and foliar fungicides and insecticides, and used N rates from 90 to 150 lbs/acre applied over three to four application times. Congratulations to our winners.

Table 1. 2011 Virginia Wheat Yield Contest Winners (http://www.vdacs.virginia.gov/news/releases-b/080211vgpawinners.shtml)

Rank	Grower	Farm	County	Bushels/acre	Cultivar
1st	Frank Hula	Riverside Farm	Charles City	129.5	Shirley
2nd	John Shepherd	Tri-County Grain Farms	Nottoway	120.9	USG 3555
3rd	Bill Nelson	Colonial Acres Farm	Henrico	120.3	Roane
4th	Craig Brann	Brann Farms	Richmond	118.0	Shirley
Other entries in the 2011 Virginia Wheat Yield Challenge					
	Chris Clarke	Ridgefield Farms	Lancaster	114.3	Shirley
	Jason Benton	Benton Farms	Middlesex	109.7	USG 3555
	David Hudnall, Sr.	Roadview Farm	Lancaster	98.4	Pioneer Brand 26R15
	Sparky Crossman	Laurel Springs Farm	Richmond	90.9	Vision 40 (HRW)

Release of the soft red winter wheat cultivar 5187J.

Cultivar 5187J, formerly designated and tested as VA05W-151, was derived from the cross 'Pioneer Brand 26R24 (PI 614110 PVPO)/McCormick (PI 632691)'. Cultivar 5187J is a broadly adapted, high-yielding, early maturing, short height semi-dwarf (gene *Rht2*). Plant color is blue green. At maturity, 5187J has white-colored, slightly tapering strap, awnletted spikes, and purple colored straw. In the eastern SRW wheat region, average head emergence is 129 to 135 d (Julian). Mature plant height is 84 to 86 cm. On average, straw strength (0 = erect to 9 = completely lodged) is moderate (2.6–3.4). Among entries in Virginia's State Variety Trials, 5187J had the highest three year average (2008–10) grain yield (5,778 kg/ha) and test weight (77.7 kg/hl). On the basis of winter kill ratings (0 = no injury to 9 = complete kill) reported at 5 of 28 locations in the 2008–09 USDA–ARS Uniform Eastern SRW Wheat Nursery (UESRWWN), winter hardiness of 5187J is good (2.1). Cultivar 5187J has notably strong gluten strength for SRW wheat and has exhibited milling and baking qualities that are most similar to those of other strong gluten SRW wheat cultivars.

Cultivar 5187J is moderately resistant to powdery mildew (*Blumeria graminis*), leaf rust (*Puccinia triticina*), and stem rust (*Puccinia graminis*) conferred by gene *Sr24* and the T1AS·1RL wheat–rye translocation. It is moderately

resistant to Barley and Cereal Yellow Dwarf Viruses, Wheat Soil Borne Mosaic Virus, Wheat Spindle Streak Mosaic Virus, *Septoria tritici* leaf blotch, and *Stagonospora nodorum* glume blotch. 5187J is susceptible to stripe rust (*Puccinia striiformis*). This cultivar expresses an intermediate level of resistance Fusarium head blight (*Fusarium graminearum*). In seedling growth chamber tests of 2009 UESRWWN entries conducted by USDA–ARS at West Lafayette, IN, cultivar 5187J was resistant to Hessian fly (*Mayetiola destructor*) biotype O and susceptible to biotypes C, D, and L. In the 2010 tests, it was susceptible to biotypes B, O, and L.

Release of the soft red winter wheat cultivar 12V51.

Cultivar 12V51, formerly designated and tested as VA05W-251, was derived from the cross 'VA98W-130//VA96W-348/Pioneer Brand 26R61 (PI 612153 PVPO)'. Parentage of VA98W-130 is 'Savannah/VA87-54-558//VA88-54-328/GA-Gore'. Parentage of VA87-54-558 is 'Massey/Holley' and parentage of VA88-54-328 is 'Lovrin 29/Tyler//Redcoat*2/Gaines'. Parentage of VA96W-348 is 'IN81401A1-32-2/FFR555W', and the parentage of IN81401A1-32-2 is 'Arthur 71/Caldwell/4/Arthur 71/3/Benhur//Riley*2/W62-63-119A'.

Cultivar 12V51 is a short height, semi-dwarf (gene *Rht2*) that is mid-season maturity, broadly adapted, and high yielding. Plant and spike color is blue green. At maturity it has creamy white colored, awnletted spikes that are strap in shape and recurved. Straw color at maturity is predominantly yellow with trace anthocyanin present. In the southern SRW wheat region, average head emergence is 114 to 118 d (Julian). Mature plant height is 79 to 86 cm. Straw strength (0 = erect to 9 = completely lodged) is moderate (1.7–3.4). In Virginia's State Variety Trials, cultivar 12V51 had a three year (2008–10) average grain yield (5,644 kg/ha) similar to that of the highest yielding cultivar. In the same tests, it had a three year average test weight of 74.7 kg/hL.

Cultivar 12V51 is resistant to *Stagonospora nodorum* glume blotch, leaf rust, and Wheat Soil Borne Mosaic Virus. It is moderately resistant to powdery mildew, Barley and Cereal Yellow Dwarf Viruses, and *Fusarium* head blight. 12V51 is susceptible to stem and stripe rust and has expressed an intermediate reaction to Wheat Spindle Streak Mosaic Virus and *Septoria tritici* leaf blotch. In seedling growth chamber tests of entries in the 2009 and 2010 Uniform Southern SRW Wheat Nurseries, conducted by USDA–ARS at West Lafayette, IN, cultivar 12V51 was heterogeneous in reaction (resistant and susceptible plants) to Hessian fly biotype O, and susceptible to biotypes B, C, D, and L.

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