



## WHEAT “CHEAT SHEET” FOR 2008 – 2009 SEASON



**Variety selection** is critical to profitability because in South Carolina we are highly dependent on varietal resistance for disease and insect management. No variety is perfect, but the ideal variety would have: consistently high yield potential, high test weight, Hessian fly resistance, powdery mildew and leaf rust resistance, and straw strength. Moderate height is also desirable (except for straw production) to reduce lodging risk and residue for double-cropping.

### Some “New” Variety Notes:

**AGS 2031** is a beardless, short-med. height wheat with medium maturity, high yield, and high test weight. It is probably best adapted to the southern coastal plain. In Georgia tests AGS 2031 had the highest 3-yr yield average. AGS 2031 is fly susceptible but has resistance to mildew, leaf rust, stripe rust, and soil-borne mosaic virus.

**AGS 2026** is medium maturity and height, with resistance to leaf rust, mildew, and race L Hessian fly. It has never been entered in the wheat challenge test so we have not compared its yield potential. Seed supply is very limited.

**Coker 9700** is a beardless, medium height, medium maturity wheat with high test weight. It is susceptible to Hessian fly and leaf rust.

**Pioneer 2687** is a bearded wheat with medium height. It has no Hessian fly resistance but good leaf rust resistance. At Blackville in 2008, it had excellent test weight, but yield was 11 bu below test average.

**S. States 8641** is a beardless, medium maturity wheat. It is medium/tall, about the same height as AGS 2000. SS 8641 has resistance to Hessian fly, leaf rust, stripe rust, mildew, and soil-borne mosaic.

**Vigoro Oglethorpe** is beardless with medium height and some resistance to race-L Hessian fly. It has good rust resistance, but is susceptible to powdery mildew. It did not lodge at Blackville, but is rated as having fair straw strength in Georgia tests. Seed is very limited in 2008.

**Diversify:** Unless only a small acreage is involved, it is always a good idea to plant more than one variety to spread risk. Try 2 - 3 of the top varieties for your area depending on your acreage. Variations in pest severity and weather conditions will favor one variety over another in any given year. When trying a new variety for the first time, you should usually keep the majority of your acreage in a proven performer.

**Certified Seed:** Use of certified seed provides a level of insurance against poor germination, seedborne diseases, and weeds. Since we are dependent on the continued development and release of specialized varieties adapted to our climate and pest complex, it benefits everyone to obey all seed laws.

### VARIETAL CHARACTERISTICS

**Maturity:** Maturity can be defined in different ways, and depending on the growing season, a medium maturity variety might be ready to harvest within two - three days of an early variety planted on the same date. The most important consideration is that early varieties will joint and head earlier. Therefore, early varieties are more susceptible to stem freeze in March and head freeze in April if planted too early.

**Hessian Fly Resistance:** Varietal resistance has worked well in controlling Hessian fly in S. C., but Hessian fly is a moving target. A “poor” rating indicates susceptibility throughout the state; “fair” indicates some resistance which may be inadequate under heavy pressure; “good” indicates resistance to the predominant fly races in the southern coastal plain (roughly below Lake Marion); Good +L indicates some resistance to race “L” Hessian fly found in the northern Coastal Plain (above Lake Marion). If a previously resistant variety fails on your farm you will need to protect it with insecticide or change varieties in the future.

## S. C. SELECTED WHEAT VARIETY CHARACTERISTICS AND PERFORMANCE - 2008

VARIETY	AWNS	MAT- <sup>a</sup> URITY	H. <sup>b</sup> FLY	POWDERY MILDEW <sup>c</sup>	LEAF RUST <sup>c</sup>	STRIPE RUST <sup>c</sup>	SBM <sup>c</sup>	HEIGHT <sup>d</sup>	STRAW STREN.	TEST WT.	TEST <sup>e</sup> WT. INDEX	YIELD (BU/AC)						YIELD <sup>e</sup> INDEX
												02	03	04	05	06	08	
<b>*AGS 2000</b>	Y	E/M	Good	Fair	Good	Poor	Poor	Med/Tall	Good	Good	+ 0.7 <sup>9</sup>	50	62	70	90	93	105	+ 5.1 <sup>9</sup>
<b>AGS 2010</b>	N	E	Good+ L	Good	Good	Good	Good	Med	Good	Good	+ 0.0 <sup>1</sup>	--	--	--	--	77	--	- 14 <sup>1</sup>
<b>AGS 2031</b>	N	M	Poor	Fair	Good	Good	Good	Short	Good	Good	+ 0.2 <sup>1</sup>	--	--	--	--	--	106	+ 4.3 <sup>1</sup>
<b>AGS 2060</b>	Y	E	Good	Fair	Good	Good	Good	Tall	Good	Good	+1.5 <sup>1</sup>	--	--	--	--	--	104	+ 2.2 <sup>1</sup>
<b>AGS 2485</b>	Y	E/M	Good	Good	Good	Poor	Poor	Med/Tall	Good	Ex	+ 2.5 <sup>4</sup>	--	67	70	82	91	--	+ 1.7 <sup>4</sup>
<b>AgriPro Magnolia</b>	Y	M	Good	Poor	Good	?	?	Med/Tall	Good	?	- 1.3 <sup>1</sup>	--	--	--	--	--	106	+ 4.9 <sup>1</sup>
<b>AgriPro Panola</b>	Y	M	Poor	Good	Fair	Good	Good	Med/Tall	Good	Fair	- 2.0 <sup>4</sup>	--	--	71	91	97	107	+ 6.4 <sup>4</sup>
<b>Coker 9436</b>	N	M	Poor	Fair	Fair	Poor	Fair	Short/Med	F/G	Fair	- 5.5 <sup>1</sup>	--	--	--	81	--	--	- 5.5 <sup>1</sup>
<b>Coker 9511</b>	N	M	Poor	Fair	Fair	Poor	Fair	Med	Good	Ex	+ 2.5 <sup>1</sup>	--	--	--	82	--	--	- 4.0 <sup>1</sup>
<b>Coker 9553</b>	Y	M	Poor	Poor	Fair	Good	Fair	Med	Good	Good	+ 1.3 <sup>3</sup>	--	--	--	84	80	97	- 6.2 <sup>3</sup>
<b>Coker 9700</b>	N	E/M	Poor	Good	Poor	?	?	Med	Good	Good	+ 1.9 <sup>1</sup>	--	--	--	--	--	98	- 2.8 <sup>1</sup>
<b>Pioneer 26R12</b>	Y	M/L	Fair	Good	Good	Good	Fair	Med/Tall	Ex	Ex	+ 1.9 <sup>5</sup>	--	68	64	90	98	99	+ 3.1 <sup>5</sup>
<b>Pioneer 26R31</b>	N	E/M	Fair	Good	Good	Poor	F-P	Short/Med	Ex	Fair	- 3.4 <sup>3</sup>	--	--	71	83	89	--	+0.3 <sup>3</sup>
<b>*Pioneer 26R61</b>	Y	E/M	Good+ L	Fair	Good	Good	Good	Med/Tall	Ex	Ex	+ 2.1 <sup>9</sup>	46	72	60	88	91	102	+ 1.5 <sup>9</sup>
<b>Progeny 185</b>	N	M/L	Poor ?	?	Fair	?	?	Med	Good	Fair	-1.5 <sup>1</sup>	--	--	--	--	--	101	-0.2 <sup>1</sup>
<b>S. States 520</b>	N	E/M	Poor	Good	Poor	Poor	Fair	Med/Tall	Good	Fair	- 4.1 <sup>2</sup>	47	--	--	--	84	--	- 2.2 <sup>2</sup>
<b>S. States 8308</b>	Y	M	Fair	Good	Fair	Fair	Poor	Med	Good	G/E	+ 0.5 <sup>2</sup>	--	--	--	--	96	101	+ 2.8 <sup>2</sup>
<b>S. States 8404</b>	Y	M	Poor	Poor	Good	Fair	Good	Short	Good	G/E	+ 1.9 <sup>2</sup>	--	--	--	--	93	107	+ 4.2 <sup>2</sup>
<b>S. States 8641</b>	N	M	Good	Good	Good	Good	Good	Med/Tall	Good	Good	- 0.3 <sup>1</sup>	--	--	--	--	--	101	- 0.7 <sup>1</sup>
<b>*USG 3209</b>	N	M	Fair	Good	Fair	Good	Good	Med	Good	Good	- 0.6 <sup>8</sup>	51	63	71	94	97	112	+ 8.5 <sup>8</sup>
<b>USG 3592</b>	N	M	Fair	Good	Good	Poor	Good	Med/Tall	Fair	Good	+ 0.2 <sup>2</sup>	--	--	68	--	91	--	+ 0.2 <sup>2</sup>
<b>Vigoro Dominion</b>	N	M	Poor	?	?	?	Good	Short	Good	Good	-0.7 <sup>2</sup>	--	--	--	--	88	96	-3.7 <sup>2</sup>
<b>Vigoro McIntosh</b>	N	M	Poor	Good	Good	Good	F-P	Tall	Fair	Good	+ 0.4 <sup>3</sup>	--	--	--	92	91	102	+ 2.6 <sup>3</sup>
<b>Vigoro Oglethorpe</b>	N	E/M	Good+ L	Fair	Good	Good	Good	Med	Good	F-G	- 1.1 <sup>1</sup>	--	--	--	--	--	101	+ 0.0 <sup>1</sup>
<b>Vigoro Tribute</b>	N	M/L	Poor	Good	Good	Poor	Poor	Short /Med	G-Ex	Ex	+ 4.2 <sup>3</sup>	--	62	65	79	--	--	- 3.7 <sup>3</sup>

LSD (P= 0.05) The "least significant difference" indicates the yield difference that is statistically meaningful:

5 5 7 7 5

**\* These varieties have had the most consistent yield potential in the S. C. coastal plain.**

a. Maturity based on jointing / heading dates and harvest maturity. Plant early varieties last to reduce freeze risk.

b. Hessian fly: Poor = no resistance; Fair = some resistance under low pressure: Good = Resistant to most HF races below Lake Marion; Good+L = some resistance to race L above Lake Marion.

c. Powdery mildew, leaf rust, stripe rust resistance varies by region and can change rapidly; SBM = soilborne mosaic virus; ratings based on observations at Blackville if available, or other states.

d. Tall = over 41" (105 cm ); short less than 37" (95 cm) under high yield conditions.

2

e. **Yield Index or Test Weight Index** shows you in one number the percent above or below average in a series of tests (not all tested varieties shown). Superscript shows number of years compared.

**The best varieties have a positive yield and test weight index over multiple years, plus good disease resistance, fly resistance, and straw strength. 2007 yield data lost to freeze.**

**Disease Resistance:** Rust and mildew resistance can change even more rapidly than insect resistance, and disease ratings are always relative. The ratings used in the table are based on our latest observations at Blackville, when available, and neighboring states. Even varieties given only a “fair” rating exhibit a significant level of resistance when compared with highly susceptible varieties.

**Test Weight and Test Weight Index:** Test weight ratings are based on performance over a period of years, but this is one characteristic that is very stable. That is, test weights may vary greatly depending on field conditions, but high test weight varieties maintain consistently better test weights over many years. The test weight index shows the percent above or below average test weight in a series of trials. The superscript number shows how many years the variety was evaluated. For example, a TW index of 2.8<sup>3</sup> means that over a 3-year period the variety’s test weight was 2.8 % above the average of other varieties tested. This would be exceptional out-performance.

**Yield Index:** The yield index indicates the percent above or below test average yield and the superscript shows the number of years compared. Consistent yielders have a positive index over several years. A high number based on only one year’s information is less meaningful.

**Height:** A value over 41” (105 cm) is a tall wheat for our area and under 35” (90 cm) is relatively short. These heights are taken under high yield conditions. Keep in mind that some tall varieties have excellent straw strength and standability.

**Straw Strength:** Is based on lodging comparisons at N rates of 90 - 120 lbs / ac.

### AGRONOMIC CONSIDERATIONS

**Seeding Rate:** Plant seed per foot, not bu. per acre. There can easily be a 30% to 40% difference in seed size dependent on variety and lot; but typically it takes 120-130 lb seed/ac to hit our maximum seeding rate targets. Calibrate drill on hard ground where you can count seed. Shoot for 21-22 seed per row ft. on 7” rows (12/ft. on 4”, 18/ft. on 6”, 24/ft. on 8”). For broadcast seeding, shoot for 36 - 40 seed/ft<sup>2</sup>. **These are high management seeding rates. Wheat compensates well for reduced seed rates and even skips in plant stands. Equivalent yields have been obtained with half seeding rates (18/ft<sup>2</sup>) and even 18-inch row skips on 15 % of the field area. Don’t give up on reduced stands.** Maximum seeding rates can reduce barley yellow dwarf yield loss and provides some insurance against poor emergence.

Some seed companies now list seed size (seed/lb) on the bag. The following table is useful for determining how much seed to purchase, checking whether the drill is putting out the correct rate, and for calibrating broadcast seeding. If no information is available on seed size, a good mid-range guess for the amount of seed to purchase is 120 lb per acre.

### Maximum Wheat Seeding Rates For Grain Production (Lbs per Acre)

Seed Size (seed/lb)	% Germination		
	90 %	80 %	70 %
10,000	157	177	202
11,000	142	160	182
12,000	131	147	168
13,000	121	136	155
14,000	112	126	144
15,000	104	117	134
16,000	98	110	126
17,000	92	103	118
18,000	87	98	112
19,000	82	92	105
20,000	78	88	100

\*Rates for 90 % germination are equivalent to 36 seed/ft<sup>2</sup> or: 18 seed/row ft (6” rows); 21 seed/ft (7” rows); 24 seed/row ft (8” rows).

Consider increasing seeding rate 10 % for reduced tillage or broadcast (40 seed/ft).

For grazing wheat, increase seeding rate 25%.

**Seeding Depth:** It matters. A good target is 1” to 1.5” deep. Over 2” can reduce tiller vigor, particularly if

heavy rain prior to emergence washes more soil over the seed.

**Planting Date:** Planting date is always a compromise between yield potential and frost / pest risks. Early planting can raise yield potential by increasing productive tiller count, promoting a larger plant, and prolonging the grain fill period; but early planting also exposes you to greater risk from spring freezes, Hessian fly, and aphid-transmitted barley yellow dwarf virus. For example, at Blackville it is risky to plant before Nov. 15, and we should try to finish by Dec. 1. In the northern coastal plain of S.C. the optimal planting date is about two weeks earlier (Nov. 1). Plant earlier-maturing varieties last to reduce freeze risk.

**Fertility:** A soil test is fundamental. pH 5.8 - 6.4. Over liming causes Mn deficiency and potential winter kill. Nitrogen: 20 lbs at-plant + 70 - 80 topdress (90 to 100 lbs total) is a good starting point for dryland wheat. There is no substitute for experience with N response on your soil and rotation. N application is critical prior to jointing. Splitting spring N applications can reduce leaching, but usually does not increase yield. Excessive N can increase disease, lodging and drought stress during head fill. Apply 10 - 15 lb sulfur; ideally about 1/3 at planting and the rest at topdress. If clay is within 12" of surface, there is little chance of a response to applied S. Fall-apply P and K to the high range by soil test (apply 80 lb/ac P or K if soil test is low; 40 lb/ac P or K if soil test is medium). K can be split fall and early spring on sandy soil. Breaking the hardpan greatly reduces S and N deficiency risk.

**Tiller Counts:** A rule of 50 tillers per ft<sup>2</sup> is sometimes used to decide whether to make an early or "split" N application in late January. A goal of 50 tillers per ft<sup>2</sup> is seldom a problem for November planted wheat in the S. C. coastal plain. Even if we get less than half a stand (10 plants per row ft out of 21 seed per row ft on 7" rows), it only takes a main stem and two tillers (3 stems) per plant to exceed 50 tillers per ft<sup>2</sup>. Multiply the stems per row ft X 1.7 to get stems per ft<sup>2</sup> on 7" rows (multiply stem count X 2 on 6" rows).

**Growth Regulator:** Cerone (ethephon 4lb/gal) is labeled at 0.5-0.75 pt/ac (applied from flag leaf emergence to early boot) to prevent lodging. This product should only be considered on irrigated wheat because drought stress during headfill will result in severe yield loss from Cerone application.

**Head Population:** Our target head population is 60 heads per ft<sup>2</sup> (6" rows = 30 heads/row ft, 7" rows = 35 heads/row ft, 8" rows = 40 heads/row ft. The typical reasons for falling short on head count include N deficiency due to rate, timing, leaching, or hardpan; and poor seedling vigor from deep planting. Water-logged soils during tillering also reduce stem count by depriving the roots of oxygen.

**Land Preparation: Broadcast deep tillage is a key to high yield wheat in the S. C. coastal plain.** Breaking the hardpan improves winter drainage and allows roots to reach nutrients and water held by the subsoil. Chiselplovers often can't reach hardpan. A Terramax or Paratill provides near broadcast deep tillage; V-ripper with 20" spacing is another option. Ripping between previous subsoil furrows after corn harvest is efficient and results in a firmer seedbed when done in advance. A firm seedbed is needed to control planting depth. Deep-tillage implements can also be used with a roller to firm and level the seedbed. Deep tillage operations are more effective when soils are dry.

**Irrigation:** Avoid drought stress during early kernel formation by applying 1" at early boot. Make a second application about 10-14 days later if no rainfall occurs. Avoid irrigation during early bloom to reduce the risk of scab.

## Weed Response<sup>1</sup> to Herbicides for Weed Management in Small Grains

	PRE	POST										
	Hoelon <sup>2</sup> 2.0-2.6 pt	Achieve <sup>3</sup> 0.44-0.6 lb	Axial <sup>4</sup> 8.2 oz	Axiom <sup>5</sup> 4-10 oz	Beyond <sup>6</sup> 4.0-6.0 oz	Buctril <sup>7</sup> 0.75-1.0 pt	Express <sup>8</sup> 0.25-0.5 oz	Harmony Extra <sup>9</sup> 0.5-0.6 oz	Hoelon <sup>10</sup> 1.3-2.6 pt	Osprey <sup>11</sup> 4.75 oz	Power Flex <sup>12</sup> 3.5 oz	2,4-D <sup>13</sup> 11-32 oz
<b>Broadleaf weeds</b>												
Buttercup	0	0	0	3	0	6	9	9	0	7	7	9
Chickweed	0	0	0	9	5	5	8	8	0	7	7	3
Curly dock	0	0	0	3	---	7	9	9	0	0	0	7
Cutleaf eveningprimrose	0	0	0	0	0	3	5	5	0	0	0	8
Henbit	0	0	0	8	7	5	7	7	0	5	6	1
Horseweed	0	0	0	5	---	8	6	6	0	0	0	9
Wild garlic	0	0	0	0	0	5	---	9	0	0	0	7
Wild mustard	0	0	0	5	5	8	9	9	0	8	8	8
Wild onion	0	0	0	0	0	4	9	9	0	0	0	6
Wild radish	0	0	0	9	---	7	8	8	0	8	8	8
Vetch	0	0	0	5	0	7	7	7	0	3	3	8
<b>Grass weeds</b>												
Annual bluegrass	0	0	4	0	7	0	0	0	0	8	7	0
Little barley	0	0	---	0	7	0	0	0	0	---	---	0
Cheat	2	0	---	0	8	0	0	0	2	3	6	0
Italian ryegrass	9*	8	9	8	8	0	0	0	9*	9*	9*	0

<sup>1</sup>**KEY TO RESPONSE RATINGS:** 0=No control; 10=100% control; ---=Data not available. Ratings are based on application of labeled rates of each herbicide, applied at the optimum timing for each weed. \*Will not control biotypes resistant to this class of chemistry.

<sup>2</sup>Control of non-Hoelon resistant Italian ryegrass in fall planted wheat. Use higher rate in field's with a history of high Italian ryegrass pressure. **Do not incorporate.**

<sup>3</sup> Apply when wheat reaches 1 to 4 leaf stage. Always add Supercharge adjuvant at 2 quarts per 100 gallons of spray solution. Apply in at least 10 gallons of water carrier per acre.

<sup>4</sup> Use Adigor adjuvant (9.6 oz per acre) which is supplied with Axial. No other surfactants are required. Do not harvest grain for 60 days after application.

<sup>5</sup>Apply to wheat at spike stage to 3 leaf stage. Preemergence will cause severe injury on coarse-textured soils. Application rate is dependent on soil type, consult label for details. Contains Sencor, consult label for varietal sensitivity.

<sup>6</sup>**Apply only to Clearfield wheat hybrids.** Make applications on wheat from two to four leaf stage to control annual bluegrass, Italian ryegrass, cheat and henbit. Apply with NIS 2 qt./100 gal **and** UAN at 1-2 qt/A **or** AMS at 1.5-3 lbs/A.

<sup>7</sup> Apply after two-leaf stage of wheat but prior to flag leaf being visible. Add 0.5 to 4 pt of nonionic surfactant per 100 gal of spray solution when applying Express alone. May tank mix with 0.125 to 0.375 lb a.i. of 2,4-D or MCPA for improved control of wild radish and other broadleaf weeds.

<sup>8</sup> Apply to wheat in at least the two-leaf stage but before the third node is detectable. Add nonionic surfactant (80% active or greater) at 0.25% (1 qt./100 gallons of water) to the spray solution. Use in at least 15 gallons spray volume per acre for ground application and in 3-5 gallons with aerial application. May be tank-mixed with 2, 4-D for improved vetch control.

<sup>9</sup>Apply to wheat in at least the two-leaf stage but before the third node is detectable. Add nonionic surfactant (80% active or greater) at 0.25% (1 qt./100 gallons of water) to the spray solution. Use in at least 15 gallons spray volume per acre for ground application and in 3-5 gallons with aerial application. May be tank-mixed with 2, 4-D for improved vetch control.

<sup>10</sup>For control of annual ryegrass in fall-planted wheat apply 1.3 to 2 pts./A on 1- to 5-leaf ryegrass prior to wheat jointing. Increase rate to 2.0 to 2.6 pts./A for ryegrass with 4 to 5 leaves. Apply in at least 10 gallons of water/A with ground equipment or in at least 5 gallons of water/A by airplane. Use a minimum pressure of 40 PSI. **Do not tank mix with Harmony Extra.**

<sup>11</sup>**For control of Hoelon-resistant ryegrass** and other annual grass and broadleaf weeds in winter wheat. Applications may be made from time of wheat emergence up to the jointing stage of development. Apply with NIS 2 qt./100 gal **and** UAN at 1-2 qts/A **or** AMS at 1.5-3 lbs/A. **Methylated seed oil** at a rate of 1.5pts./A in 10 gallons or more of water carrier per acre may be substituted for the NIS and Nitrogen additives.

<sup>12</sup>**For control of Hoelon-resistant ryegrass** and other annual grass and broadleaf weeds in winter wheat. Applications may be made from 3 leaf to jointing stage of development. Apply with NIS 1-2 qt./100 gal. When applied with liquid fertilizer, use NIS at 1 qt/100 gal.

<sup>13</sup> Apply when wheat is well-tillered (4-tillers per plant including main stem) but prior to jointing.

## Small Grain Disease Control

Diseases	Product	Rate Fl oz / Ac	Comments
<b>Powdery Mildew, Leaf Rust, Leaf /Glume Blotch, Tan Spot, Stripe Rust*</b>	Headline 2.1	6-9 oz	<p>The most effective treatment timing is usually after the flag leaf is fully emerged and before bloom. Wheat with at least 60 bu/ac yield potential is most likely to respond to fungicide treatment.</p> <p>Treat <b>powdery mildew</b> if 20 % of leaf area infected on leaf below flag leaf, and cool (high &lt; 75 F), wet weather predicted.</p> <p><b>NOTE:</b> Treating mildew before the flag leaf is fully emerged will reduce residual control of rust, glume blotch, and tan spot.</p> <p><b>Leaf Rust</b> susceptible varieties usually must be treated preventatively or at the first sign of rust because fungicides can't be applied later than flowering. Rust usually develops later than this.</p> <p>Treat for <b>leaf/glume blotch</b> or <b>tan spot</b> if 25 % of stems have a lesion on leaf below flag leaf.</p> <p>We do not know yet if <b>stripe rust</b> will become an economic problem in S. C. Stripe rust is a very aggressive disease which responds best to preventative treatment of the emerged flag leaf. For rescue treatment of stripe rust (not common leaf rust) use Tilt.</p>
	Quadris 2.1 F	6.2-10.8 oz	
	Quilt	10-14 oz	
	Stratego 1.0 lb	10 oz	
	Tilt PropiMax EC	4 oz 4 oz	
		<b>Rate fl oz 100 lb Seed</b>	
<b>Smuts, Seedling blights</b>	Baytan 30	0.75-1.5	<p><b>Note:</b> Fungicide seed treatments provide relatively cheap stand insurance and smut protection.</p> <p>Grower and commercially applied available.</p> <p>Raxil formulated in various combinations with other fungicides, insecticides. Gaucho XT also control aphids and gives some Hessian fly suppression.</p>
	RTU Baytan-Thiram	4.5-9.0 oz	
	Dividend XL RTA	5.0-10.0 oz	
	Dividend Extreme	2.0 oz	
	Raxil Raxil MD-W Gaucho XT	3.5-4.6 fl oz 5 fl oz 3.4 fl oz	
	Vitavax 200 RTU Vitavax- Thiram	2.0 oz 2.0-4.0 oz	

Small Grain Fungicide Use Precautions			
Active Ingredient	Brand Name	Application Restriction	Small Grains Labeled
<b>Foliar Fungicides</b>			
azoxystrobin	Quadris	up to flowering	wheat, barley
propiconazole	Tilt, PropiMax	up to flowering	wheat, barley, rye, oats
propiconazole + azoxystrobin	Quilt	up to flowering	wheat, barley, triticale
propiconazole + trifloxystrobin	Stratego	up to fully emerged flag leaf	wheat
pyraclostrobin	Headline	up to flowering	wheat, rye, barley
<b>Seed Treatments</b>			
carboxin-thiram	Vitavax 200, RTU Vitavax-Thiram	seed treatment	wheat, oats, barley, rye
difenoconazole- metalaxyl	Dividend XL, Dividend Extreme	seed treatment	wheat, barley
tebuconazole	Raxil	seed treatment	wheat, oats, barley
triadimenol	Baytan 30	seed treatment	wheat, oats, barley, rye

## SMALL GRAIN INSECT CONTROL

Pest	Product	Rate /acre	Comments	
<b>aphids</b>	<b><u>Seed Treatments</u></b>			
	Gaicho 600	0.8 fl oz / 100 lb	Seed treatments provide early season control of aphids and barley yellow dwarf. Seed treatments also suppress Hessian fly, but may not control heavy infestations. For Hessian fly suppression 1.6 fl oz / 100lb Gaicho 600 or 1.33 fl oz / 100lb Cruiser is recommended.	
	Gaicho XT	3.4 fl oz / 100 lb		
	Cruiser 5FS	1.0 fl oz / 100 lb		
	<b><u>Foliar</u></b>			Aphid treatments are most likely to be profitable on early-planted high-yield-potential wheat (60+ bu/ac). The key pest is the <b>oat-bird cherry aphid</b> which is the major vector or carrier of barley yellow dwarf virus. This aphid typically has a dark green body with reddish area on the “rear end”.  <b>Treatment is recommended on high yield wheat if you find 8 oat-bird cherry aphids per row foot prior to jointing.</b>  Karate and Warrior are superior to other foliar aphid treatments for suppression of barley yellow dwarf virus under SC conditions. Applying these products with top-dress N to wheat in early February will prevent most virus transmission under SC conditions.  <b>Oats are more susceptible to barley yellow dwarf than wheat but none of the effective foliar aphid treatments are labeled on oats. Gaicho seed treatment can be used on oats.</b>  <b>English grain aphids</b> (light green bodies with long black “exhaust pipes” protruding upward from rear end) increase during jointing and move to heads as they emerge in April.  <b>The treatment guideline for English grain aphid is 2-3/stem during jointing; 5/stem at head emergence to blooming; 10/stem at milk; dough stage is too late to spray.</b>
	Karate Z	1.3 – 1.9 oz	(1 gal / 100-66 ac)	
Warrior II				
Warrior 1EC	2.6 – 3.8 oz	(1gal /50-33 ac)		
Baythroid XL 1EC	2.4 fl oz	(1 gal / 53 ac)		
Proaxis 0.5	2.6 – 3.8 fl oz	(1 gal / 49-33 ac)		
<b>Armyworm</b>	Baythroid XL 1 EC	1.8 – 2.4 fl oz	<b>Treat when armyworm populations reach 2 per drill ft.</b> True armyworm infestations usually occur after flag leaf emergence.	
	Sevin 80S	1.75 lb		
	Sevin XLR	1.5 qt	Karate or Warrior treatment also provides season-long aphid control.	
	Sevin 4F	1.5 qt		
	Karate	1.9 oz		
	Warrior II	1.9 oz		
	Warrior 1EC	3.8 oz		
	Lannate LV			
Lannate 90 SP	1.5 pt	0.5 lb		
Mustang MAX 0.8 EC	3.2 oz			
Proaxis 0.5	3.2 fl oz			
<b>Fall Armyworm</b>	Sevin 80S	1.75 lb	<b>Treat if the stand is threatened before frost.</b> Fall armyworm infestations may occur on early planted	
	Sevin XLR	1.5 qt		

	Sevin 4F  Karate Warrior II Warrior 1EC  Lannate LV Lannate 90 SP  Proaxis 0.5	1.5 qt  1.9 oz 1.9 oz 3.8 oz  1.5 pt 0.5 lb  3.2 fl oz	seedling stage small grain.
<b>Cereal Leaf Beetle</b>	Baythroid XL  Malathion 57 EC Malathion 5EC Malathion 8EC  Karate Warrior II Warrior 1EC  Mustang MAX 0.8 EC  Proaxis 0.5	1.0 – 1.8 fl oz  1.5 pt 1.5 pt 1 pt  1.3 - 1.9 oz 1.3 - 1.9 oz 2.6 - 3.8 oz  2.6 - 3.2 oz  2.6 – 3.8 fl oz	Cereal leaf beetles first hatch out in March and peak feeding occurs in April. <b>Treat if you have 1 larva on every other stem (average of 0.5 larvae / stem).</b>  Karate or Warrior also provide season-long aphid control.
<b>Grasshoppers</b>	Baythroid XL  Sevin 80S Sevin XLR Sevin 4F  Karate Warrior II Warrior T 1EC  Malathion 8 EC Malathion 57 EC  Methyl Parathion 4 EC Pennacp-M  Mustang MAX 0.8 EC  Proaxis 0.5	2.4 fl oz  1.25-1.75 lb 1.0-1.5 qt 1.0-1.5 qt  1.9 oz 1.9 oz 3.8 oz  1.25 pt 2.0 pt  1 pt 2-3 pt 3.2 – 4.0 oz  3.8 fl oz	Grasshoppers typically attack wheat after flag leaf emergence. There are no well established thresholds for grasshopper treatment. Prevent flag leaf defoliation.
<b>Hessian Fly</b>	<b>Varietal resistance is the most economical way to manage Hessian fly.</b> HF resistance declines over time and varies by location depending on the predominant races of Hessian fly present. See table below. Treat susceptible varieties on farms with a history of economic damage. Proximity to wheat stubble from previous crop increases HF risk. Wheat planted in the coastal plain before 15 Nov is most susceptible to HF. Oats are immune to Hessian fly.		

<b>Hessian Fly</b>	<u>Seed Treatment</u> Gaucho 600 Gaucho XT Cruiser 5FS	1.6 fl oz/100 lb 3.4 fl oz/100 lb 1.33 fl oz/100 lb	Seed treatments will suppress but not control Hessian fly. Seed treatments also provide early season control of aphids and barley yellow dwarf. Gaucho XT also controls smut and certain seedling diseases, but only has one-half the insecticide active ingredient of the 1.6 oz rate of Gaucho 600. Adding 0.8 oz Gaucho 600 to Gaucho XT gives the same level of a.i. as 1.6 oz Gaucho 600.
	Gaucho XT + Gaucho 600	3.4 fl oz + 0.8 fl oz / 100 lb	
	<u>Foliar</u> Karate Warrior II Warrior 1EC	1.9 oz 1.9 oz 3.8 oz	
			Foliar treatment at early post emergence (2-4 leaf stage) may reduce fall infestation on susceptible varieties. March treatment (jointing) may reduce spring infestations. Control with either timing is erratic.

Small Grain Insecticide Use Precautions				
Active Ingedient	Brand Name	Pre-Harvest (Days)	Pre-Grazing (Days)	Small Grains Labeled
beta-cyfluthrin	Baythroid XL 1 EC	30	7	wheat
carbaryl	Sevin	21	7	wheat, triticale
imidacloprid	Gaucho	45	45	wheat, oats, barley, rye
lambda-cyhalothrin	Karate Z 2.08 Warrior	30	7	wheat, oats, barley, rye, triticale
gamma cyhalothrin	Proaxis 0.5	30	7	wheat, triticale
malathion	Malathion	7	7	wheat, oats, barley, rye
methomyl	Lannate	7	10	wheat, oats, barley, rye
methyl parathion	Methyl 4EC PennCap-M	15	15	wheat, oats, barley, rye
spinosad	Tracer	21	14	wheat, rye, triticale, barley, oats
thiamethoxam	Cruiser 5FS	seed treat.	no grazing restriction	wheat, barley
zeta-cypermethrin	Mustang MAX 0.8 EC	14	14	wheat

### Hessian Fly Resistance of Wheat Varieties\*

Poor**	Fair**	Good**	Good + L**
<b>AGS 2031</b> <b>AgriPro Panola</b> <b>Coker 9436, 9511, 9553, 9663, 9700</b> <b>Pioneer 26R15, 26R22, 26R24, 26R87</b> <b>Southern States 520, 8404</b> <b>USG 3295</b> <b>Vigoro Dominion, McIntosh, Tribute</b>	<b>AGS 2020</b> <b>AgriPro Crawford</b> <b>Pioneer 26R12, 26R31</b> <b>Southern States 8308</b> <b>USG 3209, 3592</b>	<b>AGS 2000, 2485, 2060</b> <b>AgriPro Magnolia</b> <b>Pioneer 2580, 26R38</b> <b>Roane</b> <b>Southern States 8641</b> <b>USG 3209,</b>	<b>AGS 2010, 2026</b> <b>Pioneer 26R61</b> <b>Vigoro Oglethorpe</b>

\* Based primarily on data provided by Dr. David Buntin (Univ. of Georgia Extension Entomologist).

\*\* Poor = no resistance; Fair = some resistance, but damaged by severe infestations; Good = resistant to the predominant HF races in the southern coastal plain of S. C. (roughly below Lake Marion); Good + L = resistant in southern coastal plain, and some resistance to the race L biotype predominant in the northern coastal plain of S. C. (roughly above Lake Marion); Note: In 2008, HF caused economic injury even in some fields of Pioneer 26R61 in areas of Sumter and Lee Counties.

## STORED SMALL GRAIN INSECT PROTECTION

Treatment	Rate	Comments
Protectant  Storcide II	12.5 oz / 5gal / 1000 bu wheat 9.9 oz / 5gal / 1000 bu barley 6.6 oz / 5gal / 1000 bu oats	Apply to grain stream as a course spray.
Surface Treatment Dipel 2X	0.5 lb / 5-10 gal / 500 ft <sup>2</sup>	Mix into top 4". Moth pest control only

### Acknowledgement

Dr. David Buntin (Univ. of Georgia Research / Extension Entomologist) provided multi-year Hessian fly resistance results.

Prepared by: Jay W. Chapin, Extension Peanut & Small Grain Specialist; Mike Marshall Extension Weed Scientist; and James S. Thomas, Ag. Science Assoc.  
Edisto Res. and Ed. Center, 64 Res. Rd., Blackville, SC 29817; 803-284-3343; [jchapin@clemson.edu](mailto:jchapin@clemson.edu)  
<http://virtual.clemson.edu/groups/smallgrains/>

The Clemson University Cooperative Extension Service offers its programs to people of all ages, regardless of race, color, sex, religion, national origin, or disability and is an equal opportunity employer. **Clemson University Cooperating with U.S. Department of Agriculture, South Carolina Counties, Extension Service, Clemson, SC. Issued in Furtherance of Cooperative Extension Service Work in Agriculture and Home Economics, Acts of May 8 and June 30, 1914.**