



WHEAT "CHEAT SHEET" FOR 2006 – 2007 SEASON

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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.

"New" Variety Notes:

AgriPro Panola has high yield potential. It has mildew resistance but is susceptible to leaf rust and Hessian fly. Test weight runs slightly below average in our trials. This is a med/tall variety with good straw strength and med maturity.

Coker 9375 This is a tall variety which has demonstrated high yield but relatively low test weight. Coker 9375 is likely to be susceptible to both powdery mildew and leaf rust in S. C.

Coker 9553 has very good test weight wheat with medium height and maturity. It is rated good against stripe rust, fair against leaf rust, and poor against mildew and Hessian fly. Yield potential has been below the test average at Blackville.

Coker 9511 has excellent test weight but is susceptible to mildew, leaf rust, and Hessian fly.

S. States 8308 has shown high yield potential and very good test weight. It has good powdery mildew resistance but is susceptible to leaf rust. It should have good H. fly resistance below the lakes, but not to race L in the Pee Dee. It has medium height and maturity.

S. States 8404 is a short wheat that has shown above average yield potential and good to excellent test weight. It is susceptible to fly and mildew, but has leaf rust resistance. It has medium maturity.

Vigoro McIntosh has high yield potential, very good test weight, and resistance to leaf rust, stripe rust, and powdery mildew. Hessian fly resistance has been erratic. This is a tall variety which may be subject to lodging at high N rates. McIntosh is a medium maturity wheat.

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 switching to 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. An 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. We rate for it every year because varietal resistance can decrease with prolonged exposure. A "poor" rating indicates susceptibility throughout the state; "fair" indicates some resistance which may be inadequate under heavy pressure; "good" indicates resistance throughout the state, including the more virulent race "L" Hessian fly found in the northern Coastal Plain (above Lake Marion). Race L is also showing up with increased frequency in the lower part of the state. If a previously resistant variety fails on your farm you will need to protect it with insecticide or change varieties in the future.

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. Even varieties given only a "fair" rating exhibit a significant level of resistance when compared with highly susceptible varieties.

SELECTED WHEAT VARIETY CHARACTERISTICS AND PERFORMANCE - 2006

VARIETY	AWNS	MAT- ^a URITY	H. ^b FLY	POWDERY MILDEW ^c	LEAF RUST ^c	STRIPE RUST ^c	TAN SPOT ^c	HEIGHT ^d	STRAW STREN.	TEST WT.	TEST ^e WT. INDEX	YIELD (BU/AC)						YIELD ^f INDEX
												01	02	03	04	05	06	
*AGS 2000	Y	E/M	Good	Good	Good	Poor	Poor	Med/Tall	Good	Good	+ 0.6 ⁸	106	50	62	70	90	93	+ 5.3 ⁸
AGS 2485	Y	E/M	F-G	Good	Good	Poor	Good	Med/Tall	Good	Ex	+ 2.5 ⁴	--	--	67	70	82	91	+ 1.7 ⁴
AgriPro Panola	Y	M	P-F	Good	Fair	Good	Poor	Med/Tall	Good	Fair	- 1.9 ³	--	--	--	71	91	97	+ 6.6 ³
Coker 9375	N	M	?	Fair	Fair	Fair	Fair	Tall	?	Fair	- 3.9 ²	--	--	--	73	87	--	+ 5.0 ²
Coker 9436	N	M	?	Fair	Fair	Poor	Fair	Short/Med	F/G	Fair	- 5.5 ¹	--	--	--	--	81	--	- 5.5 ¹
Coker 9511	N	M	Poor	Fair	Fair	Poor	Fair	Med	Good	Ex	+ 2.5 ¹	--	--	--	--	82	--	- 4.0 ¹
Coker 9553	Y	M	Poor	Poor	Fair	Good	Poor	Med	Good	Good	+ 1.4 ²	--	--	--	--	84	80	- 7.1 ²
*Pioneer 26R12	Y	M/L	F-G	Good	Good	Good	Good	Med/Tall	Ex	Ex	+ 1.8 ⁴	--	--	68	64	90	98	+ 4.6 ⁴
Pioneer 26R31	N	E/M	Good	Good	Good	Poor	Good	Short/Med	Ex	Fair	- 3.4 ³	--	--	--	71	83	89	+ 0.3 ³
*Pioneer 26R61	Y	E/M	Good	Fair	Good	Good	Fair	Med/Tall	Ex	Ex	+ 2.3 ⁸	91	46	72	60	88	91	+ 1.6 ⁸
S. States 520	N	E/M	P-F	Good	Fair	Poor	?	Med/Tall	Good	Fair	- 4.1 ²	--	47	--	--	--	84	- 2.2 ²
*S. States 8308	A	M	Good	Good	Fair	Fair	?	Med	Good	G/E	+ 1.7 ¹	--	--	--	--	--	96	+ 6.0 ¹
S. States 8404	A	M	Poor	Poor	Good	Fair	?	Short	Good	G/E	+ 2.0 ¹	--	--	--	--	--	93	+ 3.4 ¹
*USG 3209	N	M	Fair	Good	Fair	Good	Good	Med	Good	Good	- 0.5 ⁷	112	51	63	71	94	97	+ 8.3 ⁷
USG 3592	N	M	F-G	Good	Good	Poor	?	Med/Tall	Fair	Good	+ 0.2 ²	--	--	--	68	--	91	+ 0.2 ²
Vigoro Tribute	N	M/L	Fair	Good	Good	Poor	Good	Short /Med	G-Ex	Ex	+ 4.2 ³	--	--	62	65	79	--	- 3.7 ³
*Vigoro McIntosh	N	M	P-F	Good	Good	Good	Fair	Tall	Fair	Good	+ 1.2 ²	--	--	--	--	92	91	+ 3.7 ²

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

* **These varieties may have the most consistent potential across the broadest area of 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 resistance: Good = Resistant to all known HF races in S.C.; Fair = Moderately Resistant, significant potential loss under race L pressure; Poor = not resistant anywhere in S.C.

c. Powdery mildew, leaf rust, stripe rust resistance varies by region and can change rapidly; these ratings based on most recent observations at Blackville if available or other southern states.

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

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

f. **Yield Index** shows you in one number the percent above or below average yield in a series of tests (not all tested varieties are shown). The superscript shows the number of years compared. **The best varieties have consistently high yield and test weight indexes plus good disease and fly resistance.**

For more detailed performance information on these and other tested varieties go to: <http://virtual.clemson.edu/groups/smallgrains/>

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 2.8³ 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 105 cm (41") is a tall wheat for our area and under 90 cm (35") 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% 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/ft². **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/ft²) 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.

Many 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 (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/ft² 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: Soil test is fundamental. pH 5.8 - 6.4. Over liming causes Mn deficiency and potential winter kill. Nitrogen: 20 - 30 lbs at-plant + 60 - 80 topdress (80 to 100 lbs total) is a good starting point for dryland wheat, you must know 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. 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.

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.

Head Population: Our target head population is 60 heads per ft² (4" rows = 20 heads/row ft, 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. Apply 1-1.5" at early boot. Make a second application about 10-14 days later if no rainfall occurs. Avoid frequent irrigation during early bloom to reduce the risk of scab.

Weed Response¹ to Herbicides for Wheat

	PRE	POST						
	Hoelon 2.0-2.6 pt	Achieve ¹ .44-.46 lb	Buctril ² .75-1.0 pt	Express ³ 0.17-0.33 oz	Harmony Extra ⁴ 0.4-0.6 oz	Hoelon ⁵ 1.3-2.6 pt	Osprey ⁶ 4.75 oz	2,4-D ⁷ 11-32 oz
Broadleaf weeds								
Buttercup	0	0	6	9	9	0	7	9
Chickweed	0	0	5	8	8	0	6	3
Curly dock	0	0	7	9	9	0	0	7
Cutleaf eveningprimrose	0	0	3	5	5	0	0	8
Henbit	0	0	5	7	7	0	5	1
Horseweed	0	0	8	6	6	0	0	9
Wild garlic	0	0	5		9	0	0	7
Wild mustard	0	0	8	9	9	0	5	8
Wild onion	0	0	4	9	9	0	0	6
Wild radish	0	0	7	8	8	0	4	8
Vetch	0	0	7	7	7	0	7	8
Grass weeds								
Annual bluegrass	0	0	0	0	0	0	8	0
Little barley	0	0	0	0	0	0	---	0
Cheat	2	0	0	0	0	2	3	0
Italian ryegrass	9	8	0	0	0	9	9	0
*Hoelon resistant	0	8	0	0	0	0	9	0

¹**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.

1. Apply to 1 – 4 leaf stage wheat. 2. Apply from emergence to boot stage; labeled on wheat, oats, barley, rye, triticale. 3. Apply from 2-leaf to pre-flag leaf wheat. Not labeled on oats. 4. Apply from 2-leaf to pre-flag leaf wheat. Also labeled on oats & barley; 0.4 oz maximum oat rate. 5. Apply to 1 to 5-leaf ryegrass prior to wheat jointing. 6. Apply to 2-tiller stage ryegrass and follow labeled adjuvant guidelines; labeled only on wheat. 7. Apply when small grains are well-tillered (4 tillers per plant including mainstem) and before jointing.

SMALL GRAIN DISEASE CONTROL

Jay W. Chapin, Extension Specialist

Diseases	Product	Rate	PHI	Comments
Powdery Mildew, Leaf Rust, Leaf and Glume Blotch, Tan Spot, Stripe Rust*	Headline 2.1	6-9 oz	Apply Headline up to beginning of flowering.	Treat powdery mildew if 20 % of leaf area infected on leaf below flag leaf, and cool (high < 75 F), wet weather predicted. NOTE: Treating mildew before the flag leaf is fully emerged will reduce residual control of rust, glume blotch, and tan spot. Rust susceptible varieties usually must be treated preventatively or at the first sign of rust because fungicides can't be applied later than fully emerged flag leaf (Tilt, Stratego) or prebloom (Headline, Quadris). Rust usually develops later than this. Treat for leaf/glume blotch or tan spot if 25 % of stems have a lesion on leaf below flag leaf. Wheat with at least 60 bu/ac yield potential is most likely to respond to fungicide treatment. Tilt (PropiMax) labeled on wheat, barley, rye, oats. Stratego labeled on wheat. Headline labeled on wheat, rye, barley. Quadris labeled on wheat, barley. Quilt labeled on barley, wheat, and triticale.
	Quadris 2.1 F	6.2-10.8 oz	Apply Quadris up to beginning of flowering.	
	Quilt	10-14 oz	Apply Quilt up to beginning of flowering.	
	Stratego 1.0 lb	10 oz	Apply Stratego prior to heading.	
	Tilt PropiMax EC	4 oz 4 oz	Apply Tilt or PropiMax prior to heading.	
*Stripe rust is a very aggressive disease which responds best to treatment of the emerged flag leaf. We do not yet know whether stripe rust will become an economic problem in S.C.				
Smuts, Seedling blights	Dividend XL	1.0-2.0 oz/100 #	Seed treatment	Dividend labeled for wheat only. Grower and commercially applied available.
	Dividend XL RTA	5.0-10.0 oz/100#		
	Dividend Extreme	0.5-1.0 oz/100 #		
	Raxil (in various combinations with other fungicides, insecticides)	3.5-4.6 fl oz/100	Seed treatment	Wheat, oats, barley. Commercially applied and drill box formulations available. Gaucho XT and Raxil MD-W also control aphids and Hessian fly. Wheat, oats, barley, rye Wheat, oats, barley, rye
	Raxil MD-W	5 fl oz/100 #	Seed treatment	
Gaucho XT	3.4 fl oz/100#	Seed Treatment		
Vitavax 200	2.0 oz/100 #	Seed treatment		
Note: We usually don't see much yield response to seed treatment for seedling diseases in S.C.; but seed treatments provide relatively cheap stand insurance and smut protection.				

Note: Seed treatment recommendations provided by Dr. Barry Cunfer, Plant Pathologist, Univ. of Georgia.

SMALL GRAIN INSECT CONTROL

Jay W. Chapin, Extension Specialist

Pest	Product	Rate /acre	PHI	Comments
aphids	<u>Seed Treatments</u> Gaucho 480 F Gaucho XT Raxil MD-W Cruiser 5FS	1.5 fl oz / 100 lb 3.4 fl oz / 100 lb 5 fl oz / 100 lb 0.75 fl oz / 100 lb	At-plant	Seed treatments provide early season control of aphids and barley yellow dwarf. Also suppress Hessian fly. Seed treatments only labeled on wheat.
	<u>Foliar</u> Karate	1.3 – 1.9 oz (1 gal / 100-66 ac)	30	Karate or Warrior are superior to other aphid treatments for suppression of barley yellow dwarf virus under SC conditions. However, these products are only labeled on wheat and triticale.
	Warrior T 1EC	2.6 – 3.8 oz (1gal /50-33 ac)	30	<p>Aphid treatments are most likely to be profitable on early-planted high-yield-potential wheat (60+ bu/ac). The key pest is the oat-bird cherry aphid 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”.</p> <p>Treatment is recommended on high yield wheat if you find 8 oat-bird cherry aphids per row foot prior to jointing.</p> <p>English grain aphids (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.</p> <p>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.</p>
Armyworm	Sevin 80S Sevin XLR Sevin 4F	1.75 lb 1.5 qt 1.5 qt	0 forage 21 grain	Treat when armyworm population reaches 2 per drill ft. Sevin labeled for wheat and triticale only.
	Karate Warrior T 1EC	1.9 oz 3.8 oz	30 30	Karate or Warrior also provide season-long aphid control. Labeled only for wheat and triticale.
	Lannate LV Lannate 90 SP	1.5 pt 0.5 lb	7	Do not graze within 10 days. Labeled for rye, barley, oats, and wheat.
	Mustang MAX 0.8 EC	3.2 oz	14	Wheat label only.

Pest	Product	Rate /acre	PHI	Comments
Fall Armyworm	Sevin 80S	1.75 lb	0 forage	Treat if stand is threatened before frost. Do not graze within 10 days. Sevin labeled for wheat and triticale only. Labeled only for wheat and triticale. Labeled for rye, barley, oats, and wheat.
	Sevin XLR	1.5 qt	21 grain	
	Sevin 4F	1.5 qt		
	Karate	1.9 oz	30	
	Warrior T 1EC	3.8 oz	30 7	
	Lannate LV	1.5 pt		
	Lannate 90 SP	0.5 lb		
Cereal Leaf Beetle	Furadan 4F	0.5 pt	apply before heads emerge	Cereal leaf beetles first hatch out in March and peak feeding occurs in April. Treat if you have 1 larva on every other stem (average of 0.5 larvae / stem). Furadan labeled on wheat and oats. Apply Furadan before heads emerge from boot. Do not feed treated forage to livestock.
	Malathion 57 EC	1.5 pt	7	Malathion labeled on oats, rye, barley, wheat.
	Malathion 5EC	1.5 pt		
	Malathion 8EC	1 pt		
	Tracer	2-3 oz	21	
	Karate	1.3 - 1.9 oz	30	Karate or Warrior also provide season-long aphid control. Labeled only for wheat and triticale.
	Warrior T 1EC	2.6 - 3.8 oz	30	
	Mustang MAX 0.8 EC	2.6 - 3.2 oz	14	Labeled only on wheat.
Grasshoppers	Sevin 80S	1.25-1.75 lb	0 forage,	Sevin labeled for wheat and triticale only. Karate and Warrior labeled for wheat and triticale only. Labeled on wheat, oats, rye, barley. Labeled on wheat, oats, rye, barley. Labeled on wheat.
	Sevin XLR	1.0-1.5 qt	21 grain	
	Sevin 4F	1.0-1.5 qt		
	Karate	1.9 oz	30	
	Warrior T 1EC	3.8 oz	30 7	
	Malathion 8 EC	1.25 pt		
Malathion 57 EC	2.0 pt	15		
	Methyl Parathion 4 EC	1 pt		
	Mustang MAX 0.8 EC	3.2 – 4.0 oz	14	
Hessian Fly	Varietal resistance is the most economical way to manage Hessian fly. HF resistance declines over time so check the latest ratings in the Wheat Cheat Sheet. Treat susceptible varieties on farms with a history of economic damage. Proximity to wheat stubble from previous crop increases HF risk.			
	<u>Seed Treatment</u> Gaucho 480 F Gaucho XT Raxil MD-W Cruiser 5FS	1.5 fl oz/100 lb 3.4 fl oz/100lb 5 fl oz/100 lb 0.75-1.33 fl oz/100	At-plant	Seed treatments suppress Hessian fly and also provide early season control of aphids and barley yellow dwarf. Gaucho XT and Raxil MD-W also controls smut and certain seedling diseases.
	<u>Foliar</u> Karate Warrior T 1EC	1.9 oz 3.8 oz	30 30	Foliar treatment at early post emergence (2-4 leaf stage) can significantly reduce fall infestation of susceptible varieties.

STORED SMALL GRAIN INSECT PROTECTION

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

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