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Recommendations for Winter Wheat Establishment in 2009

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Winter wheat establishment recommendations:

1. Plant new seed (don't plant saved seed).
2. A fungicide seed treatment is recommended for winter wheat.
3. Wheat should be planted 1 inch deep.
4. The targeted fall stand for wheat planted from September 15th to October 1st is between 30 and 35 plants per square foot (1,300,000 and 1,500,000 seeds per acre).
5. The optimal seeding rate for wheat planted after October 1st should be incrementally increased as planting date is delayed to compensate for reduced fall tillering.
6. If saved seed is planted, increase seeding rate to compensate for reduced plant vigor.

Seeding Depth

Wheat should be planted ~1.0 inch deep depending upon soil moisture conditions. Wheat planted less than 0.5 inches deep may result in uneven germination due to seed exposure or dry soil conditions. Shallow planted wheat is also more susceptible to soil heaving. Wheat planted more than 1.5 inches deep may result in death due to pre-mature leaf opening or poor tiller development and winter survival. Uniform seed placement and seeding depth are important in promoting crop health in the fall.

Seeding rate and planting date

The targeted fall stand for wheat planted from September 15th to October 1st is between 30 and 35 plants per square foot. To achieve this goal, the seeding rate for soft red winter wheat is between 1,300,000 and 1,500,000 seeds per acre (Table 1). Depending upon varietal seed size, this equates to a range of between 74 and 119 pounds of seed per acre (Table 2). Given the late maturity of Wisconsin's soybean and corn crop, a significant number of Wisconsin's winter wheat acres will likely be planted late in 2009. The optimal seeding rate for wheat planted after October 1st should be incrementally increased as planting date is delayed to compensate for reduced fall tillering (Table 1). The late planting season will also affect crop insurance coverage. Please contact your crop insurance for specific planting date questions for your county.

Winter wheat and crop insurance (Information courtesy of Michele Austin, Director –Insurance Services; Badgerland Financial)

The Wisconsin winter wheat final planting date varies by county, ranging from September 30th to October 10th. If the wheat is seeded after the county's final plant date (late planting period) the crop insurance guarantee is reduced by 1% per day for the first 10 days. If wheat is seeded after the late planting period, the crop insurance guarantee is reduced to 60% of the original guarantee.

Special notes regarding the 2010 crop

- Winter wheat coverage is not available in all Wisconsin counties.
- Air seeded (flown on by airplane) wheat is not insurable and no premium is charged.
- The final day to turn in a 2009 winter wheat claim is October 31st.
- The 2010 wheat APH price has been set at \$5.20. The 2009 price was \$7.35.

The 2010 wheat CRC price discovery on CBOT will be determined as follows:

- The Base price tracks from August 15, 2009 - September 14, 2009
 - The Base Price was \$8.58 in 2009.
- The Harvest price tracks from July 15, 2010 – August 14, 2010
 - The Harvest Price was \$5.17 for 2009.
- There is a 200% maximum difference between the Base and Harvest Prices with no downside limit.

Table 1. Wisconsin seeding rate recommendations based on planting date.

Wisconsin Winter Wheat Seeding Rate Recommendations					
Seeds/acre Million	Seeds/sq ft	Row Width			
		6	7	7.5	
Plants per foot row					
0.4	9.2	5	5	6	
0.5	11.5	6	7	7	
0.6	13.8	7	8	9	
0.7	16.1	8	9	10	Seeding Rate for Sept 1 to Sept 15
0.8	18.4	9	11	11	
0.9	20.7	10	12	13	
1.0	23.0	11	13	14	
1.1	25.3	13	15	16	
1.2	27.5	14	16	17	Seeding Rate for Sept 15 to Oct. 1
1.3	29.8	15	17	19	
1.4	32.1	16	19	20	
1.5	34.4	17	20	22	
1.6	36.7	18	21	23	
1.7	39.0	20	23	24	Seeding Rate for Oct. 1 to Oct 10
1.8	41.3	21	24	26	
1.9	43.6	22	25	27	
2.0	45.9	23	27	29	
2.1	48.2	24	28	30	
2.2	50.5	25	29	32	
2.3	52.8	26	31	33	
2.4	55.1	28	32	34	
2.5	57.4	29	33	36	

Table 2. Seed size and seeding rate conversion table.

Seeds/lb	Seeds per acre (x 1 million)						
	1.0	1.2	1.4	1.6	1.8	2.0	2.2
Pounds of seed/acre							
10000	100	120	140	160	180	200	220
11000	91	109	127	145	164	182	200
12000	83	100	117	133	150	167	183
13000	77	92	108	123	138	154	169
14000	71	86	100	114	129	143	157
15000	67	80	93	107	120	133	147
16000	63	75	88	100	113	125	138
17000	59	71	82	94	106	118	129

Crop Rotation:

Yield data from our long term rotation experiment located at Arlington, WI indicated that wheat grain yield was greatest when following soybean (Table 1) (Lauer and Gaska, 2003-2006, unpublished). Yield of second year wheat (2003 column) was similar to wheat yields following corn for grain or silage. Third (2004), fourth (2005), and fifth (2006) year continuous wheat yields were dramatically lower than the other rotational systems. Our data suggests that growers should plant wheat after soybean first, then corn, and lastly wheat.

Table 1. Winter wheat grain yield following winter wheat, soybean, corn for grain, and corn silage.

Rotation	2003	2004	2005	2006	Average
-----Winter wheat grain yield bu a ⁻¹ -----					
Continuous Wheat	56.3 ¹	47.0	41.8	45.0	47.5
Corn-Soybean- Wheat	66.3	51.0	71.8	74.0	65.8
Soybean-Corn (grain)- Wheat	55.7	42.0 ²	51.1	66.0	53.7
Soybean-Corn (silage)- Wheat	57.7	51.0	62.0	69.9	60.2

¹2003 marked the second year of the continuous wheat rotation treatment

²Poor stand establishment in the 2004 Soybean-Corn (grain)-Wheat rotation affected wheat yield.

If growers choose to plant second year wheat several management factors should be considered to reduce risk. First plant a different wheat variety in that second year that possesses a strong disease package. Under no circumstances should growers consider planting bin-run seed in second year wheat. By planting a different variety with strong disease resistance characteristics you can reduce the likelihood of early disease pressure and significant yield loss. Growers should also consider using a seed treatment in wheat following wheat. Be aware that seed treatments are not a cure all for all common diseases in continuous wheat systems (e.g. take-all). Growers should also consider increasing their seeding rate to 1.8 to 2.0 million seeds per acre in wheat following wheat systems. This will aid in stand establishment and increase the likelihood of a uniform stand going into the winter. Lastly, if using a no-till system, planting into a seedbed that is free of living volunteer wheat is important in reducing the incidence of Barley Yellow Dwarf Virus. Growers should consider a herbicide application to any living volunteer wheat prior to planting to prevent a “green bridge” for the aphids that vector this virus.

Plant New Seed in 2009

- **To maximize wheat yields in 2010, it is imperative that growers [plant certified](#) or private (professionally prepared) seed that is true to variety, clean, and has a high germination percentage (>85%).**

The main reason to avoid planting bin-run seed in 2009 is Fusarium Head Blight (FHB), also known as scab. Scab incidence and severity was not as severe in the 08/09 crop as it was in the 07/08 crop, however the presence of scab was noted at all of our variety trial locations in 2009.

Kernels from heads infected with scab may be shriveled or shrunken and lightweight. Some kernels may have a pink to red discoloration (Image 1). Others may be bleached or white in color. Black point or kernel smudge was also noted across the state and may be caused by a number of different fungi including species of *Alternaria*, *Fusarium*, and *Helminthosporium*. Affected kernels appear black-pointed. The embryo end of the seed is discolored with a darkened pericarp and may be shriveled. The fungi that cause black point or scab of wheat seed may survive in or on the seed, thus affecting germination and contributing to seedling blight problems if seed is planted. Fungicide seed treatment and the use of quality seed will help reduce seedling blight due to infected seed but will *not* protect against subsequent head blight. Planting good quality, disease-free seed is an effective means of preventing problems from these seedborne pathogens.

Image 1. Scabby and Tombstone Kernels



(Photo courtesy of Laura Sweets)

If growers absolutely need to plant saved seed due to availability or other economic considerations, the following steps should be taken to increase the likelihood of establishing a legal and good wheat crop. The first step is to determine if you can legally plant the wheat seed you saved. Today many private wheat varieties now come with statements, which buyers sign at the time of purchase, stating that they understand they are not authorized to use the harvested grain for seed. Most currently used public winter wheat varieties are Plant Variety Protected (PVP) and though you may replant them on your own land you, do not have the right to trade/sell seed of those varieties to others for planting.

Once you have determined if you can legally plant the seed you saved, the next step is to clean the wheat seed. It is important that wheat seed be cleaned to remove small and damaged seeds and to eliminate weed seeds. Removing small and damaged seeds will not only aid in crop establishment, but will also provide a more uniform wheat seedling stand. Removing small and damaged seeds will also increase the thousand-kernel weight (TKW), which serves as a measure of seed quality. Wheat seed with TKW values greater than 30 grams tend to have increased fall tiller number and seedling vigor. The next step is to perform a germination test. Germination tests can either be completed at home or by sending a sample to the [Wisconsin Improvement Association](http://www.wisconsinimprovementassociation.org). A home test can be performed by counting out 4 sets of 100 seeds and placing each of them in a damp paper towel. Place the paper towel into a plastic bag to conserve moisture and store in a warm location out of direct sunlight. After five days count the number of germinated seeds that have both an intact root and shoot. This will give the

grower an estimate of % germination. It is important to choose random seeds throughout the entire seed lot and conduct at least 4 - 100 seed counts. If germination is below 85% it is important to increase the seeding rate to compensate; however, I would caution growers from seeding any wheat with a germination test below 80%.

The last step is to assess the need for a fungicide seed treatment. A number of fungicides are labeled for use as seed treatment fungicides on winter wheat and are listed in the *Pest Management for Wisconsin Field Crops 2009* (UW-Extension A3646). These seed treatment fungicides protect germinating seed and young seedlings from seedborne and soilborne pathogens. Seed treatment fungicides will not improve germination of seed that has been injured by environmental factors and will not resurrect dead seed. Seed treatment fungicides applied this fall will not protect against FHB infection next summer. If seed with black point or scab must be used for planting, a seed treatment fungicide should be considered.