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## PB576 Wheat Production in Tennessee

The University of Tennessee Agricultural Extension Service

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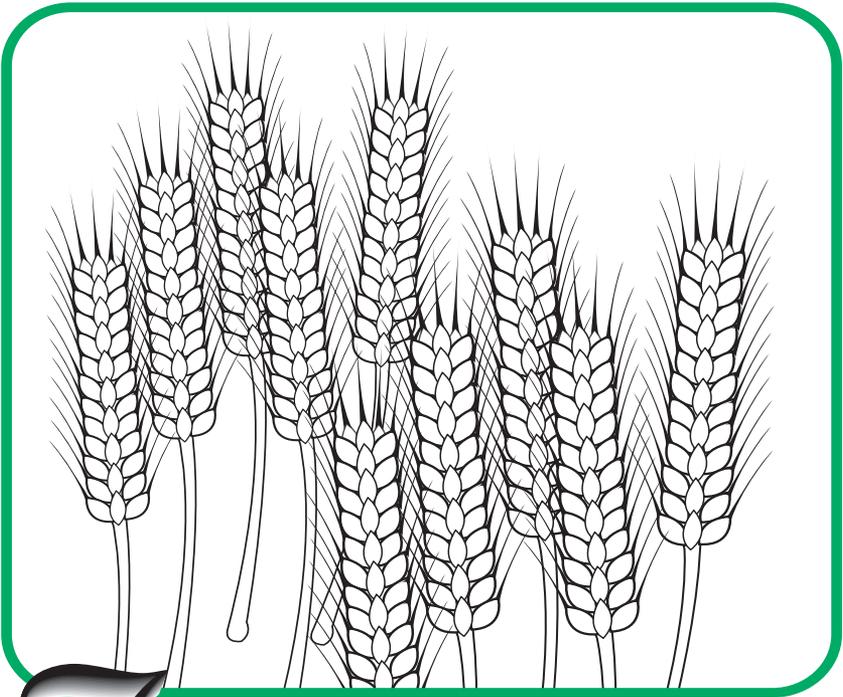
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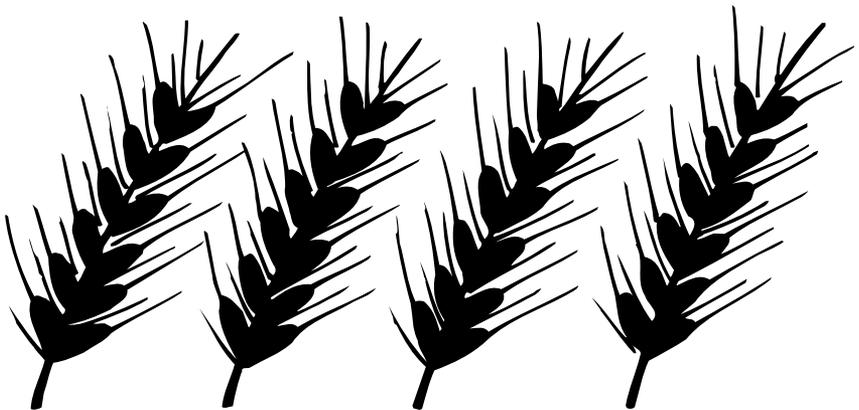
# Wheat Production in



*Tennessee*

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# Wheat Production in Tennessee

*Paulus P. Shelby, Professor  
Plant & Soil Science*

Tennessee's climate is well suited for the production of high-quality, low-protein, soft red winter wheat. This wheat is in demand by the flour milling industry and well-established local markets are adequate.

Tennessee-produced soft wheat is used primarily for milling general purpose or family flours, pastry flours and cake flours. Very little of Tennessee's wheat is used for livestock feed, except as byproducts of the milling industry.

Winter wheat is a cool-season crop and can be grown successfully in all counties of the state. Soft red winter wheat varieties recommended and commonly grown in Tennessee have adequate winter hardiness to survive the lowest winter temperatures that normally occur.

When winter temperatures are extremely low, well-rooted wheat plants may die back to the ground, but then resume growth in the spring. Wheat sown in the late fall has a shallow root system and is more susceptible to heaving and winter killing than wheat sown earlier. Freeze damage to winter wheat is more serious from late freezes in the spring when the head has just emerged from the boot. All varieties are susceptible to freeze injury in the milk and soft dough stage.

The optimum moisture requirement for favorable wheat production is somewhat less than the normal rainfall in Tennessee. Wheat is tolerant to high moisture under the cool fall and spring growing seasons of Tennessee. High moisture, in combination with high temperatures, may cause the spread of diseases and reduce yield.

Wheat is best adapted to well-drained, medium- to heavy-textured soils of high natural fertility. The highest yields are generally produced on silt and clay loams, but wheat is also grown successfully on clay soils and fine sandy loams. University of Tennessee research shows that wheat can also be grown successfully on soils that have poor internal drainage, providing they have good surface drainage.

# Recommended Wheat Varieties

It is wise to select a recommended variety which has been tested and evaluated under Tennessee conditions. Consider the characteristics of each variety, then select the variety or varieties that best suit the conditions on your farm.

Varieties tested in Tennessee and the varietal characteristics at all research locations can be found in The University of Tennessee Agricultural Experiment Station Research Report, "Performance of Wheat, Oat and Rye Varieties," by Graves, et al. Table 1 is taken from this publication.

The recommended wheat varieties and their characteristics are listed below:

<b>Table 1</b>				
<b>Brand/Variety</b>	<b>Avg. Yield</b>	<b>Date Headed</b>	<b>Date Mature</b>	<b>Plant Ht. (in.)</b>
FFR 555	56	5-1	6-9	33
Pioneer 2580	55	4-29	6-8	33
AgriPro Shiloh	55	5-1	6-7	32
AgriPro Clemens	54	5-3	6-10	37
Va Jackson	54	5-2	6-6	33
Americans Patriot	54	4-30	6-7	33
Northrup King Coker 9543	53	4-29	6-6	31
Northrup King Coker 9803	53	4-28	6-7	33
Terral 8555	53	5-2	6-7	32
Pioneer 2684	53	4-27	6-7	34
KY Verne	52	5-1	6-7	40
AgriPro Hickory	52	4-29	6-8	34
Va Madison	52	4-28	6-8	34
FFR 525	49	4-30	6-6	35
Va Wakefield <sup>1</sup>	49	5-2	6-10	37
OH Freedom <sup>1</sup> *				
Pioneer Brand 2628 <sup>1</sup> *				

<sup>1</sup> Present plans indicate that this variety will be removed from the recommended list in 1998.

\* Were not entered in 1996-97 test.

## Seeding

**Selecting the Seed:** Plant high-quality seed of known genetic purity. Certified seed is the best assurance of obtaining genetically pure seed and the performance of the variety named on the tag.

By planting certified seed of the variety chosen, you can be sure of getting **known variety, high varietal purity and known origin.**

Non-certified seed do not consistently meet these requirements.

**Seedbed Preparation:** Wheat requires a firm seedbed with only enough loose soil to cover the seed. Disking to a depth of 2 to 4 inches is usually all that is necessary in preparing a seedbed for wheat, where it follows corn, soybeans, grain sorghum or other row crops. When it is necessary to plow, the land should be plowed far enough in advance of seeding to allow for development of a firm seedbed with conventional practices. Where erosion is a problem with conventional seedbed preparation, wheat can be planted no-till with good results. A preplant burndown herbicide should be applied prior to planting if weeds are present.

**Dates:** For best winter survival and top grain yield without grazing, the time recommended for seeding Hessian fly-resistant varieties is from Oct. 15 to Nov. 10. Do not plant the Hessian fly-susceptible varieties until after the fly-free date of Oct. 15. Wheat should be planted early enough for young plants to become well-rooted and develop 3 to 4 inches of top growth before going into the winter. Research indicates that plantings made during the latter half of the recommended planting date period are less affected by barley yellow dwarf virus.

**Rates:** Recommended wheat seeding rates vary from one to two bushels per acre depending upon condition of the seedbed, time of seeding, quality of seed and method of seeding. The higher seeding rate of two bushels per acre is generally used.

Increase the rate up to two bushels per acre (1) if seed are broadcast, (2) when seeding is delayed until Nov. 1, or (3) when seedings are made on land heavily infested with johnsongrass or wild barley, to suppress growth of these weeds.

<b>Wheat</b>		
<b>Use</b>	<b>Seeding Rate</b>	<b>Seeding Method</b>
For grain or spring grazing	1-1.5 bu.*	Oct. 15-Nov. 10 no-till drilled
	1-1.5 bu.	Oct. 15-Nov. 1 conventional
	1-2 bu.	Oct. 15-Nov. 1 overseeded no tillage
For winter cover	1-1.5 bu.	Sept. 15-Nov. 10 no-till drilled
	1-1.5 bu.	Sept. 15-Nov. 1 Overseeded no tillage
	1-1.5 bu.	Sept. 15-Oct. 20 conventional
For fall grazing	2-3 bu.	Sept. 1-Oct. 1

*\* Use higher seeding rate if seeding under adverse conditions.*

*Other cover crops as arrowleaf clover, crimson clover red clover and vetch may be used with the seeding date and rates as shown in UT Extension PB 378.*

**Method and Depth:** Sowing wheat with a drill instead of broadcasting insures a more uniform depth of covering, higher germination, less winter injury and generally higher yields.

Drill or cover wheat to a depth of 1 to 1 1/2 inches when adequate moisture is available. When soil is dry, a slightly greater depth is advisable, but should not exceed 2 inches.

## Fertilization

Lime and fertilize by soil test recommendations. If lime is needed, it should be applied and incorporated into the soil before seeding. All the phosphate and potash can be applied immediately before or at planting. When double-cropping wheat with grain sorghum or soybeans, the fertilizer should be applied to the soil with the total amount of phosphate and potash needed for both crops prior to planting wheat. Apply 15 to 30 pounds of nitrogen at seeding time to stimulate vigorous plant growth. Apply 30 to 60 pounds of nitrogen as a topdressing Feb. 15-March 15. Use the earlier date if the wheat stand is thin to encourage more tillering. All the nitrogen should be applied before wheat begins to joint. Research has shown no difference in source of nitrogen (ammonium nitrate, urea or liquid nitrogen) when applied according to recommendations. If liquid nitrogen is used, it should be dribbled on with drop nozzles to prevent foliar burn.

<b>Fertilizer Recommendations</b>		
<b>Soil Test Level</b>	<b>Phosphate (P<sub>2</sub>O<sub>5</sub>) Lbs./A</b>	<b>Potash (K<sub>2</sub>O) Lbs./A</b>
Low	80	40
Medium	40	20
High	0	0

**General Fertilizer Recommendations:** In the absence of a soil test, apply 15 to 30 pounds of nitrogen, 40 to 80 pounds of P<sub>2</sub>O<sub>5</sub> (Phosphate) and 20 to 40 pounds of K<sub>2</sub>O (Potash) per acre at seeding. Top-dress with 30 to 60 pounds of nitrogen per acre February 15 to March 15.

## Weed Control

Wild garlic (commonly called wild onion), annual ryegrass and cheat are major weed problems in Tennessee wheat fields. Wild garlic infestations may cause considerable dockage at harvest. Annual ryegrass and cheat compete with wheat for light, nutrients and water and will reduce wheat yield. Weeds which infest wheat may delay harvest in the spring. Thus, an effective weed management program should be used for producing optimum wheat yields.

Good production practices aid in the control of weeds. Using weed-free seed, proper seeding rate, proper seedbed preparation and planting following a

good weed management program in a summer cultivated crop will assist in effective weed control. Where herbicides are used, timeliness of application is critical to success. Always read and follow label directions. Adhere to wheat growth stage recommendations when applying herbicides. Wheat growth stages are pictured in Figure 1.

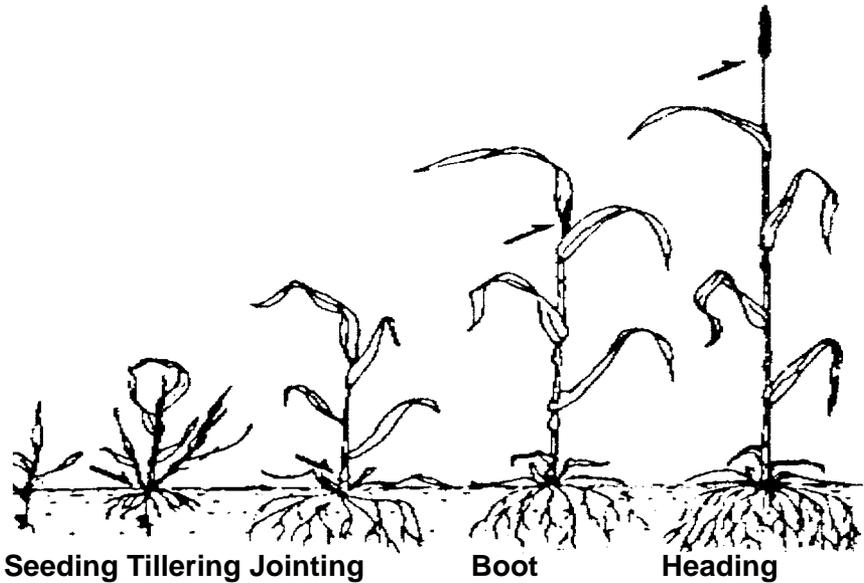


Figure 1. Arrow shows location of growing point.

## Cheat

Cheat can become a serious weed problem in many wheat fields. In fields with heavy cheat pressure, Sencor 75DF can be used. Use of Sencor may result in various degrees of injury to wheat varieties. The degree of injury is related to variety, growth stage at application and health of the wheat plants. Decisions regarding Sencor use on sensitive wheat varieties should be made by comparing expected yield loss from Sencor injury with yield loss from expected weed competition.

A management program for cheat should include the following:

1. Plant a Sencor-tolerant wheat variety in heavily infested fields. Sencor is labeled for use on a number of varieties. Refer to Sencor label for recommended wheat varieties with tolerance to Sencor.
2. Crop tolerance is dependent upon a good root system and a healthy wheat plant prior to and at time of application.
3. Apply 0.33 lb. to 0.67 lb. of Sencor 75DF per acre, depending on soil type, after wheat plants have developed three to four tillers and at least four secondary roots, 2 inches long.
4. Do not apply Sencor to wheat which has begun to joint.

## Ryegrass

Ryegrass is a problem for many wheat producers. Ryegrass will reduce yields and cause delays at harvest. Hoelon 3EC (u)\* is recommended for preemergence or postemergence control of annual ryegrass in fall-planted wheat. Ryegrass control with Hoelon may be approached in one of three ways:

\*uRestricted use pesticide.

1. Preemergence - Hoelon gives good preemergence control of ryegrass in wheat, and this option should be considered in fields which have a history of severe ryegrass problems. However, it is one of the more expensive control methods due to herbicide rate, and need for rainfall to activate the herbicide within seven days of application. Apply Hoelon at 2 to 2.6 pints per acre immediately before, or after, planting wheat. Use the higher rate where ryegrass pressure has been heavy in the past, and/or on fine-textured soils. Do not incorporate Hoelon, as reduced control of annual ryegrass will occur.

2. Early Postemergence - This is the most economical way to use Hoelon. Growers are encouraged to scout fields early (four to five weeks after planting) to check for emergence of ryegrass. If ryegrass is coming up, make plans to apply the low rate (1.3 pints per acre) to 1- to 3-leaf ryegrass.

3. Late Postemergence - If weather prohibits the early application, apply Hoelon at 2 pints per acre on 4- to 5-leaf ryegrass, or 2.6 pints per acre on ryegrass up to the 2-tiller stage.

Only one application of Hoelon should be made per season. Apply in at least 10 gallons of water per acre by ground or five gallons of water per acre by air. Postemergence application should be made prior to wheat jointing.

## Wild Garlic

The number one weed problem in our wheat fields is wild garlic (commonly called wild onion). To obtain the best control of wild garlic and the least amount of injury to the wheat crop, the following procedure should be followed:

1. Apply 0.5 to 0.6 ounce Harmony Extra per acre.
2. Apply at least 15 gallons spray volume per acre to insure coverage. (**Note:** Thorough coverage is essential for control).
3. Add nonionic surfactant (80 percent active or greater) at a rate of 1 quart per 100 gallons of water. Liquid nitrogen fertilizer may be used as a spray carrier for Harmony Extra. Surfactant must be included (1 to 2 pints per 100 gallons of spray solution) when a liquid N carrier is used. Wheat plants may exhibit temporary yellowing and stunting when sprayed with liquid N.
4. Apply when wild garlic plants are less than 12 inches tall, with 2 to 4 inches of new growth. New growth is essential for control.
5. Apply when daytime temperatures of at least 60 F are expected for three or more days. Adequate soil moisture before, during and immediately after application will improve control.
6. Harvest wheat early, prior to excessive lodging, to remove as few aerial bulblets with the combine as possible.

## Vetch

Vetch problems in Tennessee wheat fields continue to increase each year. Harmony Extra will give fair to good control of vetch. However, vetch is usually too big for good control with Harmony Extra when most growers are treating for wild garlic. For improved vetch control, 2,4-D (0.5 pint per acre of a 4 lb. per gallon formulation) may be tank mixed with Harmony Extra. Remember that 2,4-D has a more restrictive wheat growth stage limitation. Apply 2,4-D or Harmony Extra plus 2,4-D on well-tillered wheat, prior to jointing.

## Wild Mustard, Turnips, Mayweed and Cornflower

Harmony Extra or 2,4-D will give good to excellent control of wild mustard and turnips. Mayweed must be controlled with Harmony Extra. Harmony Extra is weak on cornflower (also called bachelor's button). To get good control of this weed, apply 2,4-D.

## Insects

The principal insects that may attack wheat in Tennessee are aphids, armyworms, cereal-leaf beetle and Hessian fly. Serious damage may occur in localized areas unless the insects are detected and control measures are used.

**Aphids:** Aphids feed on the leaves and grain heads of wheat and may transmit disease organisms to the plant in addition to the damage by their feeding. Aphids commonly found on wheat are English grain aphid, corn leaf aphid and greenbug.

**Cereal Leaf Beetle:** Both adults and larvae damage grain crops such as oats, barley, rye and wheat. They remove long strips of foliage between the veins. Heavy feeding gives the plants a yellowish-white, frosted appearance.

**Hessian fly:** These small insects (maggots) damage wheat by feeding near the ground between the stalk and leaf sheath of early-planted, non-resistant varieties. In the fall, many tillers and young plants may be killed. The infested wheat will tend to lodge and the heads contain shrunken grain the following spring. The best control is to use Hessian fly-resistant varieties or plant susceptible varieties after Oct. 15.

## Suggested Economic Threshold Levels

**English Grain Aphid:** Treatments should be considered when an average of 25 or more aphids are found per grain head.

**Corn Leaf Aphid:** Treatments should be considered when heavy populations are causing leaves to dry up and die in several portions of the field.

**Greenbug:** Treatment should be considered when aphids are killing three or more leaves per plant, especially during seedling stage.

**Armyworm:** Treatment should be considered when three or more worms are present per square foot.

**Hessian Fly:** No threshold levels have been established.

**Cereal Leaf Beetle:** If an average of one adult or larvae per flag leaf is reached, an insecticide application should be made to protect the flag leaf.

<b>Chemical Control Measures</b>		
<b>Insect</b>	<b>Material</b>	<b>Rate/Acre</b>
Aphids	Methyl Parathion 4EC(U)	1/2 - 1 pt.
	Disyston 8 (U)	4-12 fl. ozs.
	Karate 1.0 EC (U)	2.56-3.84 ozs.
Armyworms (True & Fall)	Methyl Parathion 4EC (U)	1/2-1 1/2 pts.
	Lannate 1.8L (U)	1-2 pts.
	Lannate 90SP (U)	1/4-1/2 lb.
	Lannate LV (U)	3/4-1 1/2 pts.
	Sevin XLR	1-1 1/2 qts.
	Sevin 80S	1 1/4-1 7/8 lbs.
	Karate 1.0 EC (U)	2.56-3.84 ozs.
Cereal Leaf Beetle	Furadan 4F (U)	1/2 pt.(see labels)
	Lannate 1.8L (U)	1-2 pts.
	Lannate 90SP (U)	1/4-1/2 lbs.
	Lannate LV (U)	3/4-1 1/2 pts.
	Sevin XLR	1 qt.
	Sevin 80S	1 1/4 lbs.
	Karate 1.0 EC (U)	2.56-3.84 ozs.
Grasshoppers	Karate 1.0 EC (U)	2.56-3.84 ozs.
	Furadan 4F (U)	1/4-1/2 pt. (see label)

*(U) Restricted Use Pesticides - See label for precautions to be taken during handling and use.*

## Diseases

In recent years, wheat diseases have increased in severity due to increased acreage and lack of crop rotation. Disease pressure can develop anytime environmental conditions are favorable for disease development. Diseases that occur frequently in Tennessee are barley yellow dwarf, leaf rust, powdery mildew, Septoria glume and leaf blotch and loose smut.

Glume blotch is most consistent in its ability to reduce yields year after year. Leaf rust and powdery mildew only cause damage in certain years when environmental conditions are favorable for these diseases.

**Barley Yellow Dwarf:** This virus disease in the past has received little attention in wheat, but it is becoming a limiting factor to production in some

areas. The light green to yellowish and sometimes reddish foliage and stunting induced by the virus are similar to the symptoms attributed to non-parasitic factors such as nutrient deficiencies and poorly-drained soil. The virus is transmitted from plant to plant by many species of aphids which feed on wheat. Some degree of control of barley yellow dwarf can be obtained by planting late in the fall, but early enough for an adequately developed root system to withstand low winter temperatures. Aphid vector control with soil-applied insecticides has been found somewhat effective in controlling this virus disease.

**Leaf Rust:** *Puccinia recondita f. sp. tritici* - Rust appears as small, round or oblong, raised orange-red pustules, mainly on the surface of the leaves. Leaf rust, when severe, reduces both grain yield and test weight. It is transmitted by wind-borne fungus spores. Foliar fungicides are effective in controlling leaf rust.

**Powdery Mildew:** *Erysiphe graminis f. sp. tritici* - Diseased plants are usually found in the spring in moist areas of fields where the growth is rank. Powdery mildew is very noticeable on the leaves as a white-powdery mass which often covers the entire blade. Later, the affected leaves turn yellow and die prematurely. Heavy attacks of powdery mildew cause plants to lodge and kernels to shrivel. Foliar fungicides are effective in controlling powdery mildew.

**Glume Blotch:** *Septoria nodorum* - Glume blotch may first be noticeable on the leaves as small oblong lesions which are light brown with dark borders. After heading, the fungus moves to the head. First indication of infestation is the brown discoloration of the glume (chaff). As the grain matures, the glume takes on a black peppery appearance, which is due to spores of the fungus.

Infection of the leaves can be serious. Severe attacks on the head can significantly reduce yield and grain quality. Glume blotch is primarily a warm-weather disease. Both glume and leaf blotch fungus spores live through the summer in crop residue. General control measures include plowing under crop residue immediately after harvest, allowing at least one year between wheat crop and use of foliar fungicides.

**Leaf Blotch:** *Septoria tritici* - Leaf blotch is more noticeable early in the spring, when it appears as irregular reddish-brown spots scattered over the leaf blade. The spots, often with ashen white centers, contain many black specks. The damage caused to portions of the leaf can reduce yields. Leaf blotch also damages the seedling and tillers.

**Loose Smut:** *Ustilago tritici* - Loose smut is easily recognized as soon as the affected heads emerge from the boot. Smut-infested heads appear earlier than normal ones and a loose, dark-colored spore mass replaces the seed in the head. Spores are washed and blown away by rain and air, and by harvest, nothing remains of the head except a bare spike. Loose smut may reduce the yield but does not affect grain quality.

The disease is seed-borne within the wheat kernel and may be controlled by treating seed before planting with materials containing Vitavax (see recommended chart).

**Head Blight or Scab:** *Fusarium* spp. - Head blight, also called pink mold, white heads and tombstone scab, is manifested by the premature death or

blighting of spikelets. The disease appears on all small grain crops and is especially important in humid regions. Significant yield losses result from floret sterility and poor seed filling.

Grain from head-blighted fields is less palatable to livestock and sometimes contains sufficient mycotoxins to induce muscle spasms and vomiting in humans and certain other non-ruminant animals. The toxins apparently remain stable for years in stored grain. Bread made from scabby wheat has been described as intoxicating. Control with crop rotation, as fungicides are only slightly effective.

**Take-All:** *Gaeumannomyces graminis var tritici*. - The term “Take-All” originated in Australia more than 100 years ago and referred to a severe seedling blight disease. Today, Take-All is best recognized as a root and shoot disease of winter wheat that interrupts plant development and seriously suppresses yield.

Take-All is most obvious near heading on plants grown in moist soil. Diseased crops appear uneven in height and irregular in maturity. Severely diseased plants easily break free at the crown when pulled from the soil.

Infested plants are stunted, mildly chlorotic, have few tillers and ripen prematurely. The heads are bleached (white heads) and sterile. Roots are blackened and brittle from fungal invasion. A black-brown dry rot extends to the crown and basal stem. Control by crop rotation and other cultural practices.

### Controlling Wheat Diseases

1. Follow fertility recommendations closely.
2. Observe recommended planting dates and seeding rates.
3. Use resistant varieties if available.
4. Use recommended fungicides properly.

### Factors Influencing Use of Foliar Fungicides on Wheat

Determining the need for fungicide application is always a question in wheat producers’ minds. One of the best methods is to follow a systematic guide such as the one developed by Melvin Newman, The University of Tennessee Extension plant pathologist.

## Wheat Foliar Fungicide Point System

The point system should be used only as a guide to determine the need for application of foliar fungicides. It does not guarantee an economical return. If a “zero” is indicated in any major (I-VIII) category, then the field **should not** be sprayed.

I. <b>Yield Potential</b> (5-7 days before first spray)	<u>Points</u>	
1. 40 b./A or above	= 150	
2. 30-39 b/A.	= 50	
3. Below 30 b/A.	= 0	I. _____

**II. Cropping History**

- 1. Wheat in field last year = 100
- 2. Wheat in field two years ago = 50
- 3. First time in wheat three years or longer = 25    II. \_\_\_\_\_

**III. Fertility** (total Nitrogen)

- 1. Applied 90-120 lbs. of Nitrogen/A. = 100
- 2. Applied only 60-90 lbs. of Nitrogen/A. = 50
- 3. Applied no nitrogen = 0    III. \_\_\_\_\_

**IV. Seeding rate** (assuming 80+percent germination)

- 1. Planted 2 or more b./A. = 75
- 2. Planted 1.5-2.0 b./A. = 50
- 3. Planted less than 1.5 b./A. = 25    IV. \_\_\_\_\_

**V. Disease** at first application (stage 10,boot stage).

- 1. Severe (disease starting on flag leaf) = 100
- 2. Moderate (bottom & middle leaves diseased) = 75
- 3. Light (disease found on lower leaves) = 50
- 4. Not present = 25    V. \_\_\_\_\_

**VI. Seasonal rainfall** prior to first application

- 1. Above normal = 100
- 2. Normal = 75
- 3. Below normal = 25    VI. \_\_\_\_\_

**VII. Traditional disease pressure**

- 1. Heavy = 125
- 2. Moderate = 75
- 3. Light = 25    VII. \_\_\_\_\_

**VIII. Disease resistance of variety grown.\***

Enter a value for each disease

**Disease Resistance Ratings\***

	<u>High</u>	<u>Med.</u>	<u>Low</u>	
1. Powdery mildew	0	50	100	1. _____
2. Leaf rust	0	100	200	2. _____
3. Glume blotch	0	50	100	3. _____

VIII. \_\_\_\_\_

Total Points \_\_\_\_\_

After inspection of each field (5-7 days **before** boot stage), producers should total the number of points to determine the probability of an economical return.

<u>Total Field Points</u>	<u>Chances of Economical Return</u>
750-1000	Excellent
500-749	Fair
Below 500	Poor (do not spray)

*\*For a list of recommended foliar fungicides and disease ratings, refer to Extension E&PP Info 201, "Stage of Growth to Apply Foliar Fungicides."*

**Stage of Growth to Apply Foliar Fungicides:** Close attention must be paid to the stage of growth to obtain maximum benefit from foliar fungicides. If the first application is made too late, then infection could have already occurred. Proper control is difficult after infection is underway.

**First application** — Apply 2 lbs. Mancozeb when head is in boot stage (stage 10).

**Second application** — Apply 2 lbs. Mancozeb about two weeks after first application when heads are fully emerged (stage 10.5).

Tilt may be applied only one time no later than stage 8 (before heading). Bayleton may be tank mixed with Mancozeb for added rust and mildew control.

Each application must be made in at least five gallons of water per acre by airplane or at least 20 gallons of water per acre with ground rigs. Always use a good spreader-binder that is labelled for fungicides with either application method.

## Recommended Foliar Fungicides

Chemical Name	Trade Name	Formulation	Rate/A per Application	Diseases Best Controlled
Mancozeb	Dithane (Rohm & Haas)	80% WP	2 lbs.	Glume Blotch
Mancozeb	Manzate 200 (DuPont)	80% WP	2 lbs.	Glume Blotch
Mancozeb	Penncozeb (ATO Chem)	80% WP	2 lbs.	Glume Blotch
Triadimefon*	Bayleton (Miles)	50% WP	2-4 ozs.	Rust, Powdery Mildew
Propiconazole	Tilt 3.6EC (CIBA)	41.8% EC	4 ozs.	Rust, Glume Blotch

\* Bayleton should be tank mixed with recommended rates of Mancozeb when leaf rust and/or powdery mildew threaten to cause damage to the flag leaf of the wheat plant. This product is very effective on rust and mildew but is weak on glume blotch. Mancozeb gives some control of rust and mildew but is not adequate when these diseases are severe.

**Seed Treatment:** The treatment of wheat seed with fungicides is an effective way of controlling blight, root rot and smuts. These diseases are caused by fungi which live from year to year in the soil, internally or on the surface of the seed. These materials are best used as either a slurry or liquid treatment.

**Do not use fungicide-treated seed for food or livestock feed.**

Recommended Seed Treatments	
Fungicide	Ounces/100 lbs. seed
Vitavax - PCNB*	3-4
Vitavax - 200*	3-4
Vitavax - 75*	2-3
Vitavax - 34*	2-3

\* Control head smut with good seed cover and higher rates.

# Harvesting and Storing

Wheat is ripe and dry enough for satisfactory combine harvest when the moisture content of the grain reaches 14 percent or less. Wheat must be 13.5 percent moisture or less to be marketed without a price discount. The discount on wheat at 14 percent is approximately 1 percent of the market value. The moisture discount is progressively greater for each .5 percent increase above 13.5 percent.

For safe storage, the moisture content of wheat for grain should not be more than 13 percent. The wheat should also be free of green foreign material. The moisture content of seed wheat in storage should be 12 percent or less to maintain high viability and vigor.

Ripe grain should be combined as soon as possible, because alternate wetting and drying of the grain results in reduced test weights.

## Other References

Other Agricultural Experiment Station bulletins and Extension publications that may help you with wheat production on your farm are:

- Bulletin, "Performance of Field Crop Varieties"
- Research Report, "Performance of Wheat, Barley, Oats and Rye Varieties"
- E&PP Info #9, "Wheat Disease Control Recommendations"
- E&PP Info #201, "Stage of Growth to Apply Foliar Fungicides"
- P&SS Info #185, "Lime and Fertilizer Recommendations for Various Crops in Tennessee"
- PB 378, "Field Crops Seeding Guide"
- PB 816, "Grain Drying Facts and Principles"
- PB 941, "Controlling Wheat Insects Successfully"
- PB 1395, "Insects in Farm-stored Grain"
- PB 1553, "Considerations for No-till Wheat"
- PB 1580, "Weed Control Manual for Tennessee Field Crops"

# Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Pesticides recommended herein were registered for the prescribed use when the publication was printed. Should registration of a recommended pesticide be cancelled, it would no longer be recommended by The University of Tennessee.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of other which may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.



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