

# Commercial Crop Production

## Field Crops - Wheat

Table 1. Symptoms, source of inoculum and management of wheat diseases.

| Disease                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Leaf Rust</b><br><i>(Puccinia triticina)</i>                                        | <p><b>Symptoms:</b> Leaf rust is widespread and probably is a destructive disease on wheat in Louisiana. The leaf rust fungus produces small, yellowish-orange pustules on the leaves. These masses of spores turn dark as wheat matures. Infection usually begins on lower leaves and spreads upward. Infected leaves turn yellow and die.</p> <p><b>Management:</b> Resistant varieties are the most practical approach. Some seed treatments provide early season suppression, but foliar-applied fungicides are most effective (Tables 2 and 3).</p>                                                                                                                                                                                                             |
| <b>Stem Rust</b><br><i>(Puccinia graminis tritici)</i>                                 | <p><b>Symptoms:</b> Elongated, reddish-brown pustules occur on the stem, leaf sheaths, leaf blades and glumes. Pustules rupture the epidermis to expose a powdery, reddish-brown mass of spores. Fragments of epidermis adhere to sides and ends of pustules to give them a ragged appearance.</p> <p><b>Source of Inoculum:</b> Has alternate host species of <i>Berberis</i> and <i>Mahonia</i> where new races may occur but spread in this area primarily is from wheat to wheat.</p> <p><b>Management:</b> Stem rust can be a serious problem in some years in localized regions of Louisiana. Resistant varieties are the most practical approach for control of this disease, although fungicides may be used (Table 3).</p>                                  |
| <b>Stripe Rust</b><br><i>(Puccinia striiformis)</i>                                    | <p><b>Symptoms:</b> The first sign of disease is individual yellow pustules, usually at the tip of the leaf. Later, pustules develop in rows, giving the characteristic of striped appearance. Leaves, sheaths, stems and glumes may be attacked.</p> <p><b>Management:</b> Resistant varieties are the most practical approach for control of this disease, although fungicides may be used (Table 3).</p>                                                                                                                                                                                                                                                                                                                                                          |
| <b>Powdery Mildew</b><br><i>(Erysiphe graminis tritici)</i>                            | <p><b>Symptoms:</b> Powdery mildew usually is found on leaves but may attack all aboveground parts of the plant. It first appears as small irregular or circular light gray spots on the upper leaf surface. Later, the plant is covered with a "floury" appearance. Leaves eventually become misshapened and die.</p> <p><b>Management:</b> The application of fungicide for the control of powdery mildew has rarely been economical.</p>                                                                                                                                                                                                                                                                                                                          |
| <b>Bacterial Streak/Black Chaff</b><br><i>(Xanthomonas campestris pv. translucens)</i> | <p><b>Symptoms:</b> Symptoms on leaves begin as dark green, water-soaked spots that eventually become necrotic and develop into streaks. On the heads, black chaff appears as stripes on the glumes, but blackening may be total.</p> <p><b>Management:</b> Use crop rotation, clean tillage and pathogen-free seed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Fusarium Head Blight/Scab</b><br><i>(Fusarium spp.)</i>                             | <p><b>Symptoms:</b> The symptoms after flowering appear as a bleaching of the glumes, spikelets, areas of the head or even the entire head. Salmon-red or pink-red spore masses frequently form on infected heads.</p> <p><b>Control:</b> Well-timed, foliar-applied fungicides only suppress disease incidence (Table 3).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Leaf and Glume Blotch</b><br><i>(Stagonospora sp.)</i>                              | <p><b>Symptoms:</b> The disease appears on the chaff and may be seen as small, irregular, grayish or brownish spots or blotches, which enlarge and become chocolate brown. As the spots age, their centers turn grayish-white and may include tiny, round, raised black spore-bearing bodies. Ordinarily, only a few glumes in a head become infected, but in severe cases the entire head is attacked and turns dark brown. Spots on the sheaths are dark brown and often include most of each sheath. Spots on leaves are light colored and usually surrounded by a brown border.</p> <p><b>Management:</b> Varieties differ in tolerance to leaf and glume blotch. Consult variety recommendations. For fungicide recommendations, please refer to (Table 3).</p> |
| <b>Take-all</b><br><i>(Gaeumannomyces graminis)</i>                                    | <p><b>Symptoms:</b> Affected plants have shortened, bleached heads that stand erect, and the affected plants are distributed irregularly throughout the field. The stem base is blackish-brown, and the roots show dark discoloration and are extensively rotted.</p> <p><b>Management:</b> Maintain balanced soil fertility and some labeled seed treatment fungicides for suppression only.</p>                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Tan Spot</b><br><i>(Pyrenophora tritici-repentis)</i>                               | <p><b>Symptoms:</b> Tan spot first appears on the lower leaves as small yellowish-brown spots that develop into oval spots. Lesion centers become tan and usually are surrounded by a yellow border or halo. As the leaf declines, the spots expand and merge into irregular tan to brown lesions.</p> <p><b>Management:</b> Deep plow crop residues. Fungicides may be used.</p>                                                                                                                                                                                                                                                                                                                                                                                    |

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| Disease                       |                                                                                                                                                                                                                                                                                                                                   |
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| <b>Yellow Dwarf</b><br>(BYDV) | <b>Symptoms:</b> Leaf discoloration in shades of yellow, red or purple, especially from tip to base and from margin to midrib. Stunting and excessive tillering are noted. White sterile heads may develop. The virus is spread by some species of aphids.<br><b>Management:</b> No adequate controls are available at this time. |

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**Table 2. Fungicides available to manage seed and seedling diseases in wheat.**

| Product <sup>1</sup>                | Rate <sup>2</sup>                    | Disease                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Apron XL LS                         | 0.0425-0.085 fl oz                   | Pythium damping-off                                                                                                                                                                                                                                                                                                                                     |
| Charter F2                          | 5.4 fl oz                            | Common bunt, flag smut, Fusarium seed rot, Fusarium seedling blight, loose smut, Pythium damping-off                                                                                                                                                                                                                                                    |
| Charter                             | 3.1 fl oz                            | Common bunt, flag smut, Fusarium seed rot, Fusarium seedling blight, loose smut                                                                                                                                                                                                                                                                         |
| Dividend XL RTA<br>Dividend Extreme | 5-10 fl oz<br>2-4 fl oz              | Common bunt, dwarf bunt, loose smut, flag smut, seed-borne Septoria, general seed rots, Fusarium Seed scab, Pythium damping-off                                                                                                                                                                                                                         |
| ManKocide                           | 4 oz                                 | Bacterial diseases, common bunt                                                                                                                                                                                                                                                                                                                         |
| Manex                               | 3.5-5.2 fl oz                        | Damping-off, seed rot, seedling blight                                                                                                                                                                                                                                                                                                                  |
| Maxim 4FS<br>Maxim XL               | 0.08-0.16 fl oz<br>0.167-0.334 fl oz | Damping-off                                                                                                                                                                                                                                                                                                                                             |
| Raxil 2.6F                          | 0.1 fl oz                            | Stinking smut, flag smut, loose smut, early season Septoria disease complex, early season Rhizoctonia root rot, early season common root rot, early season Fusarium foot rot, early season suppression of powdery mildew, early season suppression of wheat leaf rust                                                                                   |
| Stamina                             | 0.4-0.8 fl oz <sup>3</sup>           | Dry seed decay, Rhizoctonia seed and seedling disease                                                                                                                                                                                                                                                                                                   |
| Stamina F3                          | 4.6 fl oz                            | Common bunt, common root rot, dry seed decay, flag smut, Fusarium seed rot, Fusarium seedling blight, loose smut, Pythium damping off, Rhizoctonia root rot                                                                                                                                                                                             |
| Vibrance Extreme                    | 2.8-5.6 fl oz <sup>3</sup>           | General seed rots, seedling blight, root rot and damping-off caused by seed- and soilborne Fusarium spp. or Rhizoctonia spp. seedling blight, root rot and damping-off caused by soil-borne Pythium spp. seed-borne Septoria, Septoria leaf blotch common bunt, dwarf bunt, karnal bunt, flag smut, Fusarium seed scab, loose smut, Pythium damping-off |

<sup>1</sup>Reference to commercial or trade names is made with the understanding that no discrimination or endorsement of a particular product is implied by LSU or the LSU AgCenter. Labels are subject to change and users should always read the label before applying a pesticide.

<sup>2</sup>Rates are the amount of formulation (product) per-hundredweight unless otherwise noted.

<sup>3</sup>Consult label for specific rates.

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**Table 3. Recommended fungicides, rates and application timing for wheat diseases.**

| Target                                                                        | Product Choices <sup>1</sup> and Product Mode of Action Group <sup>2</sup> |       | Rate <sup>3</sup> | Time of Application                                   | PHI <sup>4</sup> |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------|-------------------|-------------------------------------------------------|------------------|
| <b>Leaf and Glume Blotch</b><br>( <i>Phaeosphaeria nodorum</i> <sup>5</sup> ) | Approach                                                                   | 11    | 6-12 fl oz        | Consult label                                         | 45               |
|                                                                               | Approach Prima                                                             | 3,11  | 3.4-6.8 fl oz     | Consult label                                         | 45               |
|                                                                               | Propiconazole Products                                                     |       |                   |                                                       |                  |
|                                                                               | <b>Bumper 41.8EC</b>                                                       | 3     | 4 fl oz           | Consult label                                         | -                |
|                                                                               | <b>PropiMax</b>                                                            | 3     | 4 fl oz           | Flag leaf emergence                                   | -                |
|                                                                               | <b>Tilt</b>                                                                | 3     | 4 fl oz           | No applications past Feeke's 10.54                    | -                |
|                                                                               | Caramba                                                                    | 3     | 10-14 fl oz       | Protect as flag leaf emerges                          | 30               |
|                                                                               | Headline                                                                   | 11    | 6-9 fl oz         | No later than Feeke's 10.5                            | -                |
|                                                                               | Lucento                                                                    | 3,7   | 3-5.5 fl oz       | Consult label                                         | 30               |
|                                                                               | Miravis Ace                                                                | 3,7   | 13.7 fl oz        | Do not apply after Feeke's 10.5.4                     | -                |
|                                                                               | Priaxor                                                                    | 7,11  | 4-8 fl oz         | No later than Feeke's 10.5                            | 30               |
|                                                                               | Proline 480 SC                                                             | 3     | 4.3-5 fl oz       | First appearance of disease but not past Feeke's 10.5 | 30               |
|                                                                               | Prosaro 421 SC                                                             | 3     | 6.5-8.2 fl oz     | Consult label                                         | -                |
|                                                                               | Quilt Xcel                                                                 | 3,11  | 10.5-14 fl oz     | No applications past Feeke's 10.5                     | 35               |
|                                                                               | Stratego YLD                                                               | 3,11  | 4 fl oz           | Consult label                                         | -                |
|                                                                               | Twinline                                                                   | 3,11  | 7-9 fl oz         | No applications past Feeke's 10.5                     | -                |
| <b>Rust</b>                                                                   | Approach                                                                   | 11    | 6-12 fl oz        | Consult label                                         | 45               |
|                                                                               | Approach Prima                                                             | 3,11  | 3.4-6.8 fl oz     | Consult label                                         | 45               |
|                                                                               | Priaxor                                                                    | 3,7   | 4-8 fl oz         | No later than Feeke's 10.5                            | -                |
|                                                                               | Propiconazole Products                                                     |       |                   |                                                       |                  |
|                                                                               | <b>Bumper 41.8EC</b>                                                       | 3     | 4 fl oz           | Consult label                                         | -                |
|                                                                               | <b>PropiMax</b>                                                            | 3     | 4 fl oz           | Flag leaf emergence                                   | -                |
|                                                                               | <b>Tilt</b>                                                                | 3     | 4 fl oz           | No applications past Feeke's 10.54                    | -                |
|                                                                               | Caramba                                                                    | 3     | 10-14 fl oz       | Protect as flag leaf emerges                          | 30               |
|                                                                               | Headline                                                                   | 11    | 6-9 fl oz         | No later than Feeke's 10.5                            | -                |
|                                                                               | Lucento                                                                    | 3,7   | 3-5.5 fl oz       | Consult label                                         | 30               |
|                                                                               | Proline 480 SC                                                             | 3     | 4.3-5 fl oz       | First appearance of disease but not past Feeke's 10.5 | 30               |
|                                                                               | Prosaro 421 4C                                                             | 3     | 6.5 to 8.2 fl oz  | Consult label                                         | 30               |
|                                                                               | Quilt Xcel                                                                 | 3, 11 | 10.5-14 fl oz     | No applications past Feeke's 10.5                     | -                |
|                                                                               | Stratego YLD                                                               | 3,11  | 4 fl oz           | Consult label                                         | 35               |
|                                                                               | Tebuconazole Products                                                      |       |                   |                                                       |                  |
|                                                                               | <b>Folicur 3.6F</b>                                                        | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Orius 3.6F</b>                                                          | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Tebustar 3.6F</b>                                                       | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Monsoon</b>                                                             | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Muscle 3.6F</b>                                                         | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Tebuzol 3.6F</b>                                                        | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | Twinline                                                                   | 3,11  | 7-9 fl oz         | No applications past Feeke's 10.5                     | -                |
| <b>Scab</b> (suppression only)                                                | Caramba                                                                    | 3     | 10-14 fl oz       | Consult label                                         | 30               |
|                                                                               | Proline 480 SC                                                             | 3     | 4.3-5 fl oz       | Consult label                                         | 30               |
|                                                                               | Prosaro 421 4C                                                             | 3     | 6.5 to 8.2 fl oz  | Consult label                                         | 30               |
|                                                                               | Tebuconazole Products                                                      |       |                   |                                                       |                  |
|                                                                               | <b>Folicur 3.6F</b>                                                        | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Orius 3.6F</b>                                                          | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Tebustar 3.6F</b>                                                       | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Monsoon</b>                                                             | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Muscle 3.6F</b>                                                         | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Tebuzol 3.6F</b>                                                        | 3     | 4 fl oz           | Consult label                                         | 30               |
|                                                                               | <b>Miravis Ace</b>                                                         | 3, 11 | 13.7 fl oz        | Do not apply after Feeke's 10.5.4                     | -                |

<sup>1</sup>Reference to commercial or trade names is made with the understanding that no discrimination or endorsement of a particular product is implied by LSU or the LSU AgCenter. Labels are subject to change and users should always read the label before applying a pesticide. Consult label for restrictions.

<sup>2</sup>Mode of action groups are determined by the Fungicide Resistance Action Committee (FRAC).

<sup>3</sup>Rates are the amount of formulation (product) per acre unless otherwise indicated.

<sup>4</sup>Preharvest interval (PHI) is the minimum number of days allowed between the last application and harvest. If not listed consult label.

<sup>5</sup>Formerly *Stagonospora nodorum* and *Septoria nodorum*.