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Disease Ratings of Commercial Forage Sorghum Hybrids

Texas Agricultural Extension Service · The Texas A&M University System · Zerle L. Carpenter, Director · College Station, Texas

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DISEASE RATINGS OF COMMERCIAL FORAGE SORGHUM HYBRIDS

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Forage Sorghum Seed Companies

Asgrow Seed Company
Conlee Seed Company
Dekalb Ag Research, Inc.
Douglass King Seed Company
Funk Seed Company, Inc.
George Warner Seed Company
Growers Seed Association
Horizon Seeds, Inc.
Northrup, King and Company
Pioneer Hi-Bred Int., Inc.
R. C. Young Seed and Grain Company
Richardson Seed Farms
Taylor-Evans Seed Company
Texas Triumph Seed Company
WAC-Seedtec Seed Company

AREA OF STATE WHERE INFORMATION IS APPLICABLE

Disease ratings shown in this publication are applicable anywhere designated hybrids are grown and indicated diseases occur. The probability of disease occurrence on forage hybrids is highest in South, South Central and East Texas. Continuous cropping of forage hybrids on the same fields and presence of johnsongrass stands are two factors that are likely to enhance the occurrence of major disease problems.

HOW TO USE DISEASE RATING INFORMATION

Growers must consider a number of factors when selecting forage hybrids. Among them are tonnage potential, palatability and susceptibility to disease. Forage producers are urged to use this disease rating information when experiencing damage from downy mildew and maize dwarf mosaic. Select hybrids that have the desired use characteristics (production and quality) with resistance or tolerance to the disease(s) that occur on a given farm. Seed companies can furnish information on growth characteristics and quality of forage for the hybrids they produce.

EXPLANATION OF RATINGS

Downy Mildew (systemic infection)

Very Resistant - Very resistant hybrids have infection only on a low percentage of plants where the organism occurs. No stand loss or production loss should occur.

Resistant - Resistant hybrids may sustain low levels of systemic infection but little or no yield loss should result. Such hybrids can be grown safely in areas where the disease occurs without measurable loss from systemic infection.

Moderately resistant - In fields where downy mildew is present, a noticeable amount of plants may become infected. Yield loss is moderate with some increase in disease potential the following year.

Moderately susceptible - Hybrids in this range may have yield loss where the disease potential is high. Furthermore, growing hybrids in this class in areas of high disease incidence may cause organism populations to increase in the soil.

Susceptible - Susceptible hybrids grown in soil where downy mildew fungus is present may result in substantial yield decreases in the first cutting with little or no yield in second or third cuttings. Do not grow susceptible hybrids in fields where downy mildew is a limiting production factor.

Downy Mildew (foliar infection)

Very resistant - Hybrids rated as very resistant to downy mildew foliar infection have little reddening and loss of lower leaves. Occasional infection may be noticed, but it should not limit production.

Resistant - Resistant hybrids have some infection when conditions are favorable for foliar infection and the organism is present. Little yield loss is experienced, however.

Moderately resistant - Hybrids in this class may have noticeable infection on most lower leaves but yield losses should be only moderate.

Moderately susceptible - When conditions are favorable for infection and the organism is present in sufficient population, hybrids in this class may have noticeable infection with measurable yield reduction.

Susceptible - Susceptible hybrids may be stunted with the entire field having a reddish cast from infected leaves. The numbers of cuttings and yields per cutting are reduced where the disease is a limiting factor.

Maize Dwarf Mosaic

Very tolerant - Only mild symptoms are expressed on very tolerant hybrids with little or no effect on growth and population. Select very tolerant hybrids where infected johnsongrass is common and maize dwarf mosaic is a limiting production factor.

Tolerant - Tolerant hybrids show more evidence of infection than very tolerant hybrids but they can be grown without measurable damage where the maize dwarf mosaic virus is prevalent in johnsongrass.

Intermediate - Intermediate hybrids show obvious symptoms of infection when grown in areas infested with johnsongrass. Some stunting and yield loss can occur if heavy, early infection develops.

Susceptible - Severe mottling and red leaf may occur in susceptible hybrids when virus infection occurs, especially in early season. Plants are stunted and some stands may be lost. The red leaf symptom produced by the maize dwarf mosaic virus is a different symptom than that produced by the downy mildew fungus (foliar infection). Red leaf produced by the virus initially is on the upper leaves while the downy mildew fungus begins on lower leaves and moves upward. Do not grow susceptible hybrids where maize dwarf mosaic is a limiting production factor.

DISEASE DESCRIPTIONS

Downy Mildew (systemic infection)

Systemically infected forage sorghum plants have striped leaves and are stunted when compared to healthy plants. Light green stripes usually run the

length of leaves and are noticeable even to the inexperienced observer. Seedlings infected early in their development may die. Those infected later may continue to live but poor regrowth after cutting.

Leaves of infected plants that show white-to-light-green stripes have a downy growth on the underneath surface especially when observed in the early morning. This symptom gives the disease its name of "downy mildew." Affected leaves shred as the plant approaches maturity. They may appear to have been subjected to a storm. Systemically affected plants do not usually produce heads.

The term "systemic infection" indicates that the fungus is growing within plant tissue and is not limited to certain spots on a leaf which is the case with leaf infection. As the fungus grows among internal plant tissues, it destroys the head tissue and weakens leaf tissues which results in shredding. When the leaf shreds, it releases thick-walled spores to the soil that overwinter and give rise to infection next year.

The amount of systemic infection that occurs is dependent upon the susceptibility of the hybrid being grown, population of the fungus in the soil and soil temperatures. Generally later planted sorghum has less systemic downy mildew than that planted earlier if the other two comparative factors are constant. Resistance to systemic infection does not necessarily mean that the hybrid is resistant to foliar infection. While there seems to be some linkage of these characteristics, it is not always the case.

The continuous production of a downy mildew susceptible hybrid in an infested area may build up spore populations in the soil to a point where susceptible hybrids cannot be grown. Use of resistant hybrids on the other hand serves to limit the amount of inoculum produced.

Downy Mildew (foliar infection)

The "down" produced on the under surface of systemically infected plants consists of spores and spore-bearing structures of the downy mildew fungus. These spores differ from the overwintering spores produced in leaf tissues. They are thin walled, short lived and airborne. When they are deposited by wind on the leaves of susceptible sorghum plants and free moisture is present, foliar infection occurs. This results in dead patches on the leaf with "down" again being produced on the lower leaf surface. When spores are numerous and conditions for infection are ideal, entire leaves may be killed. Generally lower leaves are infected first, and disease development progresses upward.

When a hybrid is grown that is susceptible to foliar infection, the fungus is present, and when conditions favor disease development, a field of forage sorghum may appear very abnormal. Do not misdiagnose the reddened leaves as having "red leaf" which is associated with maize dwarf mosaic infection. With maize dwarf mosaic virus infection, the upper leaves are the first to show the red leaf symptom while with foliar infection by the downy mildew fungus, the lower leaves become infected first.

In some forage sorghum hybrids, plants showing foliar downy mildew symptoms may develop systemic infection. The same fungus (Peronosclerospora sorghi) causes both systemic and leaf infection.

Foliar infection may decrease or stop completely when weather conditions become dry. For this reason foliar infection is considered less damaging than systemic infection which stays with a plant all of its life. For example, foliar infection may appear at the first harvest and not on the second or third. Growers who experience crop damage from downy mildew infection should select a hybrid with good production potential that has resistance to both systemic and foliar infection.

Maize Dwarf Mosaic

Maize dwarf mosaic is caused by an aphid-transmitted virus that overwinters in the rhizomes of johnsongrass. These virus particles are extremely small and contaminate the mouth parts of aphids that feed on johnsongrass and sorghum. As the aphid moves from johnsongrass to sorghum, virus particles are transmitted. The virus multiplies rapidly in forage sorghum plants and within ten days symptoms appear.

The most common symptom is mottling which is represented by alternate light and green areas on the leaf. Symptoms may be mild or severe, depending on susceptibility of the hybrid being grown. In some cases, upper leaves may be light yellow because of severe reaction. Plants showing these symptoms are stunted and grow less efficiently than healthy plants.

In some susceptible hybrids, a "red leaf" symptom may appear when virus infection takes place and the atmospheric temperature falls below 55^{0}/F. Red streaks appear on infected leaves. Fields containing such plants look ragged and grow poorly with more than the usual amount of time required to reach the first harvest.

Johnsongrass control is not usually practical when forage sorghum is grown even though it reduces the occurrence of maize dwarf mosaic. A more practical approach is to select hybrids with good production potential and resistance to the disease. Producers who do this have few problems with the disease caused by maize dwarf mosaic virus.

DISEASE RATINGS OF COMMERCIAL FORAGE SORGHUM HYBRIDS

Company/Hybrid	Downy Mildew systemic	Downy Mildew foliar	Maize Dwarf Mosaic
1. Anton Master Graze DR (Warner)	Resistant	Moderately susceptible	Tolerant
2. Anton Su Sweetie Graze (Warner)	Resistant	Moderately susceptible	Tolerant
3. Asgrow Beefbuilder TD	Very resistant	Resistant	Intermediate
4. Asgrow Grazer M	Very resistant	Resistant	Susceptible
5. Conlee Cow Vittles	Moderately resistant	Resistant	Intermediate
6. Conlee Dine-A-Mite	Resistant	Susceptible	Tolerant
7. Conlee Do-Mor	Resistant	Resistant	Tolerant
8. Conlee Hay Smak	Moderately resistant	Susceptible	Intermediate
9. Conlee Mor Gain	Susceptible	Moderately susceptible	Tolerant
10. DeKalb SX-17+	Resistant	Moderately resistant	Intermediate
11. Funk G-88F	Resistant	Resistant	Intermediate
12. Funk G-98	Moderately resistant	Resistant	Intermediate
13. Funk G-102S	Resistant	Very resistant	Intermediate
14. Funk HW-5111-815-F	Very resistant	Resistant	Susceptible
15. Growers 30F	Resistant	Resistant	Susceptible
16. Growers 1586F	Resistant	Moderately resistant	Susceptible
17. Horizon F-12	Moderately resistant	Moderately resistant	Susceptible
18. Horizon SP-110	Moderately resistant	Moderately resistant	Susceptible

Company/Hybrid	Downy Mildew systemic	Downy Mildew foliar	Maize Dwarf Mosaic
19. Horizon Kafir Dan	Susceptible	Resistant	Susceptible
20. King K-100	Resistant	Resistant	Intermediate
21. King 61	Moderately susceptible	Moderately susceptible	Tolerant
22. King 61 DR	Resistant	Moderately resistant	Very tolerant
23. King Sugar Red	Moderately resistant	Resistant	Susceptible
24. King Silo King	Susceptible	Resistant	Intermediate
25. King Sugar Sweet	Susceptible	Susceptible	Tolerant
26. King Sugar TRU	Resistant	Moderately resistant	Susceptible
27. NK 300	Moderately susceptible	Moderately susceptible	Intermediate
28. NK 326	Resistant	Resistant	Intermediate
29. NK 367	Moderately resistant	Very resistant	Intermediate
30. NK Millex 24	Very resistant	Very resistant	Very tolerant
31. NK Silo Milo 3	Resistant	Resistant	Intermediate
32. NK Sordan 79	Very resistant	Moderately resistant	Tolerant
33. NK Trudan 8	Resistant	Susceptible	Intermediate
34. NK X-7984-F	Very resistant	Very resistant	Susceptible
35. NK X-8042-F	Resistant	Resistant	Intermediate
36. Pioneer 911	Susceptible	Moderately susceptible	Intermediate
37. Pioneer 923	Susceptible	Resistant	Intermediate
38. Pioneer 931	Susceptible	Resistant	Intermediate
39. Pioneer 947	Moderately resistant	Very resistant	Susceptible

Company/Hybrid	Downy Mildew systemic	Downy Mildew foliar	Maize Dwarf Mosaic
40. Pioneer 956	Moderately susceptible	Moderately resistant	Susceptible
41. Pioneer 988	Moderately susceptible	Susceptible	Intermediate
42. Pioneer 989	Moderately susceptible	Susceptible	Intermediate
43. Richardson Bundle King II	Moderately resistant	Resistant	Susceptible
44. Richardson Silo Master	Moderately resistant	Resistant	Intermediate
45. Richardson Sugar Red	Moderately resistant	Moderately resistant	Susceptible
46. Richardson Sugar Su	Susceptible	Susceptible	Susceptible
47. Richardson Sugar Su-D	Moderately susceptible	Moderately resistant	Tolerant
48. Richardson R79Fa	Moderately susceptible	Moderately susceptible	Intermediate
49. Richardson R79Fx	Susceptible	Susceptible	Tolerant
50. Taylor-Evans Goldmaker	Moderately resistant	Resistant	Susceptible
51. Taylor-Evans Goldmaker-T	Moderately resistant	Very resistant	Susceptible
52. Taylor-Evans Haygrazer	Moderately resistant	Susceptible	Tolerant
53. Taylor-Evans Haygrazer-II	Resistant	Moderately susceptible	Tolerant
54. Taylor-Evans Haygrazer-T	Moderately susceptible	Moderately resistant	Intermediate
55. Taylor-Evans Milkmaker	Resistant	Resistant	Intermediate
56. Taylor-Evans Milkmaker-T	Resistant	Very resistant	Intermediate
57. Taylor-Evans Silomaker	Moderately susceptible	Moderately resistant	Intermediate

Company/Hybrid	Downy Mildew systemic	Downy Mildew foliar	Maize Dwarf Mosaic
58. Taylor-Evans Yieldmaker	Susceptible	Moderately resistant	Tolerant
59. Texas Triumph Bet-R-Sile	Moderately resistant	Resistant	Intermediate
60. Warner Gro-N-Graze DR (wht)	Resistant	Resistant	Tolerant
61. Warner 2-Way	Resistant	Resistant	Intermediate
62. Warner Sucrosse S-1	Susceptible	Moderately susceptible	Susceptible
63. Warner Sucrosse 2-S	Moderately susceptible	Moderately susceptible	Intermediate
64. Warner Sweet Bee (fertile)	Moderately resistant	Moderately susceptible	Intermediate
65. Warner Sweet Bee (sterile)	Susceptible	Moderately resistant	Susceptible
66. Warner Sooper-Su	Resistant	Moderately resistant	Intermediate
67. Warner Gro-N-Grazer GTR-1	Resistant	Moderately susceptible	Tolerant
68. Warner Circle W-R	Moderately susceptible	Moderately susceptible	Tolerant
69. Warner Circle W-W	Moderately susceptible	Susceptible	Intermediate
70. Warner Gro-N-Graze DR (red)	Resistant	Moderately resistant	Tolerant
71. Warner Gro-N-Graze PTR-1	Moderately resistant	Susceptible	Susceptible
72. Warner Gro-N-Graze (Okla.)	Moderately susceptible	Susceptible	Susceptible
73. Warner 2-Way-A	Moderately susceptible	Resistant	Intermediate
74. Warner 2-Way-DR	Very resistant	Very resistant	Intermediate
75. Warner 2-Way-T	Moderately susceptible	Very resistant	Intermediate

Company/Hybrid	Downy Mildew systemic	Downy Mildew foliar	Maize Dwarf Mosaic
76. Warner Sooper-Su (wht)	Moderately susceptible	Susceptible	Susceptible
77. Warner Sooper-Su A (wht)	Susceptible	Susceptible	Susceptible
78. WAC-Seedtec Hi-Energy	Moderately resistant	Very resistant	Susceptible
79. WAC-Seedtec Hi-Ton	Moderately resistant	Resistant	Susceptible
80. WAC-Seedtec Sic-um	Moderately resistant	Moderately resistant	Intermediate
81. Young Red Top Kandy	Susceptible	Moderately resistant	Intermediate
82. Young RTK XTRA	Resistant	Resistant	Intermediate

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