BARLEY YELLOW DWARF VIRUS IN ALABAMA
2002 OAT CROP

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Within the last two weeks, the virus disease barley yellow dwarf has been diagnosed in oats collected in several southeast Alabama counties. While the occurrence of this disease is no surprise, the severity of the damage in the affected fields has been extensive.

In Alabama, barley yellow dwarf (BYD) is the most common and widespread virus disease of oats, wheat, and barley. In a 1995 survey, all of the Alabama wheat fields sampled contained plants with diagnostic symptoms associated with infections of barley yellow dwarf virus (BYDV). Infection levels varied from 2 to 100% of the wheat plants sampled. At high levels of infection in North Alabama, yield losses have been estimated at between 21 to 42 bushels per acre. Significant yield reductions for wheat were also noted in other parts of the state.

Commonly grown oat cultivars appear to be particularly sensitive to this disease. In addition to the above small grains, hosts for BYDV and several other closely related viruses include nearly 100 annual and perennial grasses, some of which serve as sources of these viruses and the aphid vectors. In particular, perennial grasses such as Kentucky bluegrass, orchardgrass, and tall fescue are potential reservoirs of BYDV. Also, small grains planted in the late summer or early fall for winter forage may also be sources of this virus in wheat and oats planted for grain.

Approximately 20 aphid species are known to vector or transmit BYDV. The aphid vectors are spread northward by low level air currents. Aphids acquire the virus by feeding on infected plants and can transmit BYDV within one to two days for the remainder of their lives.

On oats, symptoms of BYDV infection are often very striking and are fairly diagnostic for this disease. Yellowing or reddening of the leaf tips are the early symptoms of this disease. Later, the entire leaf turns reddish-orange to purpose or brown. Typically, most of the leaves on all of the tillers on BYDV-infected plants are discolored. Fall-infected plants are stunted and produce fewer, lower test weight
seed. In infection levels are relatively low, patches of discolored plants can easily be spotted against the
deep green color of healthy oats. Given the right conditions, infection levels in oats can reach 100%,
and the planting will be destroyed.

Wheat is the other major host of BYDV. Symptoms first appear as yellow, red, and sometimes
purple blotches at the leaf tip. The discoloration progresses towards the base of the leaf and mid-rib.
Typically, the yellowing and reddening of the leaves is not as noticeable on wheat as on oats. Leaf
coloration is most intense when the weather is cool. Some stunting and yield reduction is also associated
with BYDV infections of wheat, particularly if the plants were infected in the fall.

BYDV-infected oats and wheat cannot be cured. Furthermore, attempts to control the aphid
vectors with insecticides will not slow disease spread but may, in fact, accelerate virus transmission
within the target crop. Preventive measures are the only options available for reducing the level of virus
infection in oats and wheat.

In Alabama, delaying the planting of oats and wheat grown for seed until November can
significantly reduce the risk of a damaging BYDV outbreak. Both small grains, when planted in
September and October as winter forage, are extremely vulnerable to this virus. As a result, oats and
wheat grown for seed should be isolated from fields of small grains planted for winter forage.

Planteing a BYDV-resistant or tolerant cultivar is considered the best control option.
Unfortunately, not a great deal of information is available concerning the reaction of wheat and oat
cultivars to BYDV. Also, symptom severity is not always the best guide to cultivar susceptibility to this
virus. In the Alabama Small Grain Variety Trials, some noticeable site variation in the reaction of wheat
and oat cultivars to BYDV has been observed. Among the oat cultivars, Chapman and GA Mitchell
have proven to be among the most susceptible to this disease. In contrast, the least noticeable symptoms
were most often seen on the oat cultivars Harrison and Horizon 314. Under the right conditions, these
oats lines may also suffer heavy damage. None of the experimental oat lines has any better BYDV
resistance than available cultivars. Under favorable conditions, none of the commercial and
experimental wheat lines demonstrates much resistant or tolerance to BYDV.

On wheat, Alabama farmers also have the option of using the insecticide Gaucho, which is
applied as a seed dressing before planting to suppress BYDV. Previous studies have shown that this
seed treatment can greatly reduce the symptoms of BYDV and significantly increase the yield of wheat.
Gaucho, however, is not cleared for use on oats. Producers need to read the Gaucho label to review the
treatment instructions and rotation restrictions.