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Grain Crop Insect Control

David Buntin, Grain Crop Entomologist

Cruiser Maxx Cereals not effective for Hessian fly Control in Wheat

A recent issue of Southeast Farm Press (15 October) had a very good article on fungicides and disease management in wheat. However, in this article the author states that the insecticide in Cruiser Maxx Cereals will control Hessian fly and suppress aphids and barley yellow dwarf virus. As I mentioned in last month's newsletter, the rate of the insecticide in this product alone is much too low for effective Hessian fly control and also is too low for BYD suppression. Indeed, the label recommends adding an additional 1.0 fl. oz per CWT of Cruiser 5FS for Hessian fly control. If Hessian fly is a concern, I highly recommend planting a resistant variety instead of trying to control Hessian fly with insecticides on a susceptible variety.

Monsanto/DeKalb Seeds Introduce a new Bt Trait in Corn for Corn Earworm Control.

Monsanto Comp. has received final approval for sale of a new Bt trait for corn. The trait is the MON 98043 event and will be marketed as YieldGard VT PRO. The PRO designation indicates the new trait. The currently available Bt traits, YieldGard – corn borer and Herculex I – corn borer, have limited activity against corn earworm feeding on kernels in the ear. YieldGard VT PRO (YGPRO) has very good efficacy against earworms in the ear. In my small-plot trials I found over 95% reduction in ear damage compared to a susceptible hybrid with the same base genetics. YGPRO also has very good activity at preventing whorl damage by fall armyworm. It remains to be seen if this trait will provide the same high level of control when planted on a large scale, but research results are encouraging. YGPRO will only be available in a few hybrids and on a limited basis for 2010. Indeed, hybrids with YGPRO next year may not be well adapted to South Georgia conditions. The trait also will be available in a triple stack product called YieldGard VT Triple PRO, which has a Bt rootworm trait and RR2 glyphosate tolerance.

Bt Traits for Corn Hybrids.

Numerous Bt traits are now available in corn hybrids in Georgia. These are available singly in some hybrids, but an increasing number of hybrids have more than one trait stacked in the same hybrid. Including the new YieldGard VT PRO trait discussed above, there are now 3 distinct Bt traits for caterpillar (Lepidoptera) control in corn. Target pests for these traits are corn borers (European, Southwestern, and others), fall armyworm, corn earworm, and cutworms. Activity

against lesser cornstalk borer also is of interest in the Southeast, but none of Bt caterpillar traits specifically list lesser as a target pest.

The second group of traits target rootworm beetles where the larva feed on and prune roots during mid-season. The target pest in the Southeast is the Western corn rootworm. This beetle only is a pest of continuous corn and control is not needed where corn is annually rotated with other crops. With the exception of the MON863 event, all of the BT rootworm traits are highly effective at preventing mid-season rootworm damage by Western corn rootworms. A second rootworm species, the southern corn rootworm also occurs in Georgia and is mainly a seedling pest of corn. Bt rootworm traits are not effective against southern corn rootworm.

The following table by a group of southern corn Entomologist and lists the various Bt traits for corn. The table also provides relative efficacy ratings for the main target pests. The final section of the table lists various stacked products. Herbicide tolerance traits are not listed, but most Bt corn hybrids also will have either Roundup-Ready (glyphosate) tolerance or the Liberty-Link glufosinate tolerance.

Table. Relative Efficacy of Various Bt Corn Products¹

PRODUCT TRADE NAME (Abbreviation)	Corn Borers: stalk	Cutworm: seedling	Lesser Corn-stalk Borer ²	Fall army-worm: whorl	Corn earworm: ear	Western corn rootworm: ³ roots	Refuge requirement*	Characteristics	Event(s)
Traits for Lepidopterans (corn borers, corn earworm, fall armyworms, etc)									
Agrisure CB/LL	Excellent ⁴	Poor	Poor-Fair	Good	Fair-Good	none	50%	Cry1Ab Corn borer protection Glufosinate herbicide tolerance	<u>Bt11</u>
Herculex I	Excellent	Good	Good-Excellent	Excellent	Poor-Fair	none	50%	Cry1F Corn Borer, Western Bean Cutworm, Black Cutworm and Fall Armyworm resistance Glufosinate herbicide tolerance	<u>TC1507</u>
YieldGard Corn Borer	Excellent	Poor	Poor-Fair	Good	Fair-Good	none	50%	Cry1Ab Corn borer protection	<u>Mon810</u>
YieldGard VT Pro (VTP)	Excellent	Poor	Poor-Fair	Excellent	Very good	none	20%	Cry1A.105 and Cry2Ab corn borer, fall armyworm, corn earworm protection	Mon 89034
Traits for Mid-season Rootworms									
Agrisure RW	none	none	none	none	none	Very good	20%	Modified Cry3A, Protection of Western, Northern and Mexican corn rootworm	<u>MIR604</u>
Herculex RW	none	none	none	none	none	Excellent	20%	Cry34/35Ab1 Western Corn Rootworm Northern Corn Rootworm Mexican Corn Rootworm Resistance Glufosinate Herbicide Tolerance	<u>DAS-59122-7</u>
YieldGard Rootworm	none	none	none	none	none	Fair - Good	20%	Cry 3Bb Corn Rootworm Protection	<u>Mon863</u>
YieldGard VT™ Rootworm/RR2	none	none	none	none	none	Excellent	20%	Cry3Bb Corn Rootworm Protection Glyphosate Herbicide Tolerance	<u>MON 88017</u>
Stacked Traits for Lepidoptera and Rootworms									
Agrisure CB/LL/RW	Excellent	Poor	Poor-Fair	Good	Fair-Good	Very good	50%	Cry1Ab Corn borer protection Modified Cry3A, Protection of Western, Northern and Mexican corn rootworm and Glufosinate herbicide tolerance	<u>Bt11+MIR604</u>
Agrisure GT3000	Excellent	Poor	Poor-Fair	Good	Fair-Good	Very good	50%	Glyphosate Herbicide Tolerance Cry1Ab Corn borer protection	Bt11+ MIR604+SYTGA21

PRODUCT TRADE NAME (Abbreviation)	Corn Borers: stalk	Cutworm: seedling	Lesser Corn-stalk Borer ²	Fall army-worm: whorl	Corn earworm: ear	Western corn rootworm: ³ roots	Refuge requirement*	Characteristics	Event(s)
								Modified Cry3A, Protection of Western, Northern and Mexican corn rootworm and Glufosinate herbicide tolerance	
Herculex XTRA	Excellent	Good	Good-Excellent	Excellent	Poor-Fair	Excellent	50%	Cry1F Corn Borer, Western Bean Cutworm, Black Cutworm and Fall Armyworm resistance Northern Corn Rootworm Western Corn Rootworm Mexican Corn Rootworm Resistance Glufosinate Herbicide Tolerance	<u>TC1507 + DAS 59122-7</u>
YieldGard Plus	Excellent	Poor	Poor-Fair	Good	Fair-Good	Very good	50%	Cry1Ab Corn borer protection Cry 3Bb Corn Rootworm Protection	<u>Mon810+Mon863</u>
YieldGard VT™ Triple	Excellent	Poor	Poor-Fair	Good	Fair-Good	Excellent	50%	Cry1Ab Corn borer protection Corn Rootworm Protection Glyphosate Herbicide Tolerance	<u>MON 810 + MON 88017</u>
YieldGard VT Triple Pro (VT3P)	Excellent	Poor	Poor-Fair	Excellent	Very good	Excellent	20%	Cry1A.105 and Cry2Ab corn borer, fall armyworm, corn earworm protection Cry3Bb corn rootworm protection Glyphosate Herbicide Tolerance	Mon 89034 Mon 88017 Nk603

¹ Most of these insect resistant products are marketed as stacks with herbicide resistant products.

² Lepidopteran Bt traits do not specifically list lesser cornstalk borer as a target pest.

³ There are several species of corn rootworm in the southeast. Southern corn rootworm is the most prevalent species. These “rootworm” products are not effective against southern corn rootworm. They are effective against western corn rootworm larvae, which occur in areas such as north Alabama and north Georgia.

⁴ The exact meaning of these terms is somewhat arbitrary. Excellent means better than 95% control. Poor means about 30-50% control.

* See product Insect Resistance Management (IRM) documentation from the seed companies for more details.

IS TILLAGE THAT IMPORTANT TO SMALL GRAINS?

Dewey Lee, Small Grains

Many tillage studies have been conducted in Georgia on both sandy and clayey soils and the yield response to tillage has often been significantly different between the two soil types. Most of the small grains in Georgia are planted on loamy sands to sandy loam soils. These soils tend to easily compact and form a hard pan and once disturbed will again easily compact under either rainfall or continuous equipment traffic. Small grain root strength is poor and roots do not penetrate these dense, compacted soils very easily. Prolonged rainfall causes low soil oxygen conditions by filling the air spaces with water. Small grain root growth is then easily restricted by the soil density and lack of oxygen. For these reasons, small grains respond to deep tillage by subsoiling, chisel plowing or paraplowing. When compared to deep tillage, no-tilling wheat will reduce yields as little as 5-8% or as much as 25 to 30%. Economically, it makes sense to deep till before planting small grains.

Is the effect the same in clayey or silty loam soils? No, not necessarily. Yields in a conventional planted environment (i.e. disking, chiseling, etc) are about the same or a little better than those planted no-till. A light disking or chiseling is sufficient for good production in these environments.

Economically will it pay for itself....in most any type of sandy soils-absolutely, even given the current pricing environment and fuel cost.

WHEN IS TOO LATE TO PLANT SMALL GRAINS?

Dewey Lee, Small Grains

Many factors determine the effects that planting dates have on small grain production. Temperature, moisture, disease, weeds, and/or insect pressure and irradiation are the environmental factors that generally affect plant growth during the fall and winter months. Obviously, each year is therefore different. So as you can see, the best planting dates are often moving targets. In general, though, research and experience has shown us that the week before and after the first frost day, is usually the best period. For most of Georgia this will occur sometime in early to mid-November. This window of time allows small grains to grow roots deep enough and produce enough tillers to sustain an excellent yield potential. As you past these dates, growing degree units decline and negatively affect the number of tillers and roots that can be produced. Very seldom are yields of a December planted crop better than one that is planted in November. In addition, the vernalization requirement of the variety may not be met when planted late in the season thus delaying the reproductive phase and growth at the proper time. Grain yields of late planted small grains will easily be reduced 25 to 75% of normal. Yield loss progressively increases the later one plants. The same is true for planting small grains for cover crops. Studies in Tifton have shown the dry matter production of small grains planted in

December is reduced by 60% of that from small grains planted in October. It is important therefore to plant in a timely manner to achieve the best yields for either grain or dry matter production. As you plant later, expect yields to decline and accelerate in loss as you approach mid to late December.

Medium to late maturing, long vernalizing varieties should be only planted early to mid way of the planting window. Medium maturing varieties with medium to short vernalization varieties can be planted throughout the planting window. Yield reductions occur less with medium to early maturing/medium to short vernalizing varieties when planted late as compared to the later materials. If you are two to four weeks past your prime planting period, then only use short to medium vernalizing varieties. Generally, I will not recommend planting beyond that window.