Cheaper Ain’t Always Better, Know What You’re Buying!

Each year generic pesticides tend to encompass more and more of our crop protection arsenal. In many instances we expect and have seen the generic product perform identically to the name brand product. In the limited instances where this performance differed it has generally been attributed to the differences in the inactive ingredients or “other ingredients”. When comparing two products, to determine the similarity it should be as simple as reading the label. It is important that you read this label carefully!

An example of one product that generic formulations vary greatly is in Metolachlor containing products, such as Bicep II Magnum or Dual II Magnum. On first look at the generic forms of this product you would note the use rates and the labels look similar, however major differences exist. The previously mentioned herbicides contain crop safeners, which minimize potential crop injury, not all generics contain these.

All metolachlor containing products contain a mixture of two different forms of the active ingredient called S and R isomers. The ratios of these two forms vary, and this contributes to a significant difference in activity. Research suggests that R-metolachlor is approximately 50% as active as S-metolachlor. Labeled rates are the same for all products. At the same application rate; products with high R-metolachlor concentrations are approximately 50% as effective, and therefore control will be greater for the products containing a larger percentage of S-metolachlor. One may ask due to this difference can one increase the rate to overcome this? Research indicates this is not an effective approach, not to mention illegal as it is an off label.
application.

The brand name products discussed are not chosen for a specific endorsement. They are some of the most common herbicide brands questions arise about. The take home message is that when selecting crop protection products do your research and thoroughly read the label to determine if the product truly is similar. If the labels match identically, expected control should not differ. The only differences you may see are potentially in corporate support and future product development support. It is critical that application rates be used according to the labeled rates. These are carefully selected to provide the best level of control obtainable with the product. Application of a lower rate will certainly decrease control and can contribute to resistance, as we are painfully aware with the Palmer epidemic.

Is the Use of Pre-Emergent Herbicides Worth the Cost?

![Image](Palmer amaranth control with residual herbicides. Clayton, 2006.)

Many of you have been asking the question is the “use of Pre-Emergent herbicides worth the expensive input cost”. In the above benchmark study, 10 farmers over 19-20 sites were evaluated for the years of 2006-2009. In this study, the farmer allowed the University to treat a portion of their farm according to University standards, while the grower treated the rest of the field as he normally would treat. In this scenario, the Universities portion of the field received more

<table>
<thead>
<tr>
<th>Approach</th>
<th>Yield</th>
<th>Weed control cost</th>
<th>Net Return</th>
<th>Weed population</th>
<th>Active ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Corn</td>
<td>Soybean</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Farmer</td>
<td>79</td>
<td>43</td>
<td>29.59</td>
<td>-7.85</td>
<td>157.33</td>
</tr>
<tr>
<td>University</td>
<td>85</td>
<td>47</td>
<td>37.11</td>
<td>19.19</td>
<td>197.93</td>
</tr>
</tbody>
</table>

P > F 0.3732 0.0416 0.0263 0.6426 0.4607 0.3550 0.5771 0.2086 0.0244

Data include 10 farmers representing replications. Data are from 2006, 2007, 2008, and 2009. Data for corn and soybean yield are pooled over 19 and 20 site/year combinations, respectively. Data for weed control cost, net return, weed populations, and active ingredients represent 39 farmer/year combinations. Grain prices in each category included: low, $3/bushel corn and $8/bushel soybean; medium, $5/bushel corn and $12/bushel soybean; high, $7/bushel corn and $16/bushel soybean.

Figure 1
Weed Control Updates

**Weeds, why bother**

- Italian Ryegrass = 1 plant/ft² = 60 bu/ac Wheat @ $7.00 = $420
- Cocklebur = 1 plant/ft² = -30 bu/ac Soybeans @ $13.00 = -8 weeks $24.38;
- Full season = $55.77
- Palmer Amaranth = 1 plant/5ft² = -1,000/ac Cotton @ $1.00/lb = $50
- 30 bu/ac Soybeans @ $13.00 = $43.00

Turn rows

**Results of Soybean Seed Treatment Trial from 2010 Tri-County Field Day**

Last August, many of you had an opportunity to view our Soybean Seed Treatment Test Plots at the Tri-County Corn/Soybean Field Day hosted by Talley Farms. This trial, one of four in the state, examined various seed treatments and inoculums used on soybeans at planting. Following are the results of these trials.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>2010 (AVG 4 sites)-Bu/A</th>
<th>2008-10 (AVG 10 sites)-Bu/A</th>
<th>2010 Stanly County-Bu/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inovate</td>
<td>43.4</td>
<td>---</td>
<td>35.2</td>
</tr>
<tr>
<td>Trilex 6000</td>
<td>44.6</td>
<td>43.3</td>
<td>35.7</td>
</tr>
<tr>
<td>Votivo</td>
<td>43.7</td>
<td>---</td>
<td>36.4</td>
</tr>
<tr>
<td>Cruiser Maxx</td>
<td>44.3</td>
<td>43.8</td>
<td>35.7</td>
</tr>
<tr>
<td>Optimize 400</td>
<td>43.8</td>
<td>43.1</td>
<td>34.7</td>
</tr>
<tr>
<td>Vault HP</td>
<td>43.7</td>
<td>---</td>
<td>36.9</td>
</tr>
<tr>
<td>Excalibre</td>
<td>43.5</td>
<td>---</td>
<td>36.0</td>
</tr>
<tr>
<td>Magnify</td>
<td>43.1</td>
<td>---</td>
<td>37.5</td>
</tr>
<tr>
<td>Hansen EXP 101</td>
<td>43.9</td>
<td>---</td>
<td>37.3</td>
</tr>
<tr>
<td>Hansen EXP 102</td>
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<td>34.9</td>
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<td>Hansen EXP 103</td>
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<td>36.8</td>
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<tr>
<td>Check</td>
<td>43.8</td>
<td>43.1</td>
<td>36.6</td>
</tr>
</tbody>
</table>
A number of seed treatments that claim to aid in nematode management are rapidly emerging. Naturally we are beginning to field a number of questions about these treatments and hope to provide answers. Before we start however some definitions are needed:

1. Fungicide – Any seed treatment will almost always contain a fungicide and usually two or three to control post- and pre-emergence damping off. The basic fungicide chemistry differs little between one company and another. They are designed to control the same two to three soil borne diseases. They rarely affect nematodes or insects.

2. Neonicotinoid insecticide - thiamethoxam in Cruiser®, imidacloprid in Gaucho®, and clothianidin in Poncho® are common examples of insecticides used on cotton and soybean. These systemic insecticides have averaged about three weeks of protection against thrips. NCSU testing has generally not shown a positive growth response to neonicotinoids in the absence of insects. They have little if any activity against nematodes.

3. Polymer – a polymer is a complex chemical that is used in seed treatments to insure that the pesticide additives as well as other materials adhere to the seed and allow for easier and safer handling, as well as insuring that seed flows through equipment.

4. Colorant – a dye added to the polymer to identify the components of the additives (will likely vary by company).

5. Biological- A number of bacteria, actinomycetes, and some fungi that may be added to enhance disease and or nematode control. They may be stand-alone treatments for “organic” agriculture or be adjuncts to traditional chemical control agents. Many are bacteria in the genus Bacillus. Bacilli are the preferred type of biological because they form spores which are relatively stable and resistant to degradation over time. A strain of Bacillus subtilis is the active ingredient in Kodiak® and Bacillus fermis is the active ingredient in Votivo®. Another biological is known as Messenger® or N-Hibit™ when used as a seed treatment. This is the Harpin protein that stimulates plant defense mechanisms to protect against attacking pathogens. This Harpin protein was discovered through its ability to protect against bacterial plant pathogens, its efficacy against fungal or nematode pathogens is less clear.

6. Avicta® - or Abamectin® is an organic fermentation product that comes from a soil inhabiting actinomycete (Actinomycyes vermitilis). Since this is biological there are various strains which may be more or less potent as toxins to the mites insects, or nematodes. Overall, these Ivermectins are extremely toxic to nematodes at very low doses with very little mammalian toxicity. They are however nearly insoluble in water and are not systemic, so activity is limited in soil.

7. Aeris® is a carbamate insecticide (thiodocarb – also marketed as the insecticide Larvin®). It has good nematicidal activity and limited systemic activity.

We have evaluated a number of nematicidal materials on corn, cotton, and soybean. The most extensive North Carolina research was supported by the North Carolina Soybean Producers Association Check Off program. The results were disappointing. It’s not that they didn’t work, just that they didn’t work as well as we had hoped. At the rate they will be applied to seed, there likely will be no negative effects (phytotoxicity or stunting, and we don’t foresee negative interactions with herbicides). Next, we must consider the crop and species of nematode involved.

Cotton

In the case of Cotton, both Aeris® and Avicta® have been approximately equivalent to 5 to 7 lbs/acre of Temik® for nematode control. Neither product controls thrips, thus on cotton they should...
be used in combination with insecticidal seed
treatments (Cruiser® or Gaucho®) or a systemic
insecticide to control thrips such as Temik in furrow.
Avicta® may be weaker on reniform nematode than
some other products.

**Corn**

A limited number of tests with Avicta® on corn have
generally resulted in increases in yield roughly
equivalent to that achieved with Counter® for root-
knot, Columbia lance, and stubby root nematode.

**Soybean**

Trials on soybean have shown yield increases with
seed treatments for soybean cyst nematode (the most
common problem) have not be statistically significant.
That does not mean that they will not improve soybean
yield. We have seen yield increases on the order of 1/2/
to five (5) bushels/acre, but the increases have not been
consistent over locations and conditions. One to two
bushel yield increases are more common, but in no trial
have we seen that these products actually control
nematodes. None of these products have had any
impact on the numbers of nematodes we find.

**Control vs. Management**

Are we controlling pests (pathogens, weeds, insects)
with our practices or pesticides? The answer is a
definite NO! At best, we manage pests. Control
implies elimination of the pest or completely removing
adverse effects of the pest. At best, we suppress plant
pest populations and this allows us to produce a crop
profitably. These materials are more properly
considered aids to pest management. In the case of
nematicidal seed treatments they may act more as
repellants that allow us to improve growth under
nematode pressure in order to improve yield potential.

**Summary**

When one considers the number of potential
compounds and possible combinations that can be
applied to seed, we obviously we cannot evaluate them
all. This said, evaluating claims is a difficult task at
best. What is a grower, agent, or consultant to do?

1. Have a soil sample processed by NCDA & CS
   Agronomic Testing in order to determine if a
   nematode problem exists.

2. Evaluate the product literature provided and
   compare to competing claims. Since these
   nematode control measures will probably come
   with other pesticides that may or may not be
   needed, this may become an expensive nematicide.

3. Consider potential yield increases; it’s easier to
   make a profit on better land than on poor land.

4. Even a small yield increase with current prices can
   improve profitability

5. If possible, evaluate the results yourself if you have
   a yield monitor. Order some treated and untreated
   seed and place one in one hopper to see if there is a
   visible difference in treatment (note: perceived
   growth increases or lack thereof do not mean a
   yield increase).

6. Remember, for the most part these treatments are
good, but are not guaranteed to improve
profits. Seed treated by a reputable dealer is the
way to go. You can treat your own seed, but there
is enough art and science involved that you are
unlikely to beat the big guys.
Southern Piedmont
Small Grains Field Day
May 17, 2011
4:30 PM
Medlin Farms
6602 Morgan Mill Road
Monroe, NC 28110

Plots include: 15” planted, 7” drilled and broadcast plantings; Early planting of late maturing varieties; Fungicide seed treatment evaluation; Insecticide seed treatment evaluation; Foliar fungicide; Variety evaluation (30 Varieties), Head Scab Management; Topdress nitrogen plus fungicide evaluations

Photo Courtesy of Andrew Gardner, NCCES-Union County