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Corn seed treatments in 1999

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Corn seed treatments in 1999

Abstract
Most producers take it for granted that the corn seed they buy has been treated with an effective fungicide to help prevent seedling diseases. It is true that corn seed treatments are effective, and the specific products used to treat the seed are evolving. Recent trends in corn seed treatment are continuing in 1999: most seed has been treated with Maxim+Apron. It is estimated that about 80 percent of the corn seed planted in the United States will be treated with Maxim+Apron or Maxim XL, with the remaining 20 percent having a Captan+metalaxyl treatment.

Keywords
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Most producers take it for granted that the corn seed they buy has been treated with an effective fungicide to help prevent seedling diseases. It is true that corn seed treatments are effective, and the specific products used to treat the seed are evolving. Recent trends in corn seed treatment are continuing in 1999: most seed has been treated with Maxim+Apron. It is estimated that about 80 percent of the corn seed planted in the United States will be treated with Maxim+Apron or Maxim XL, with the remaining 20 percent having a Captan+metaxalyl treatment. Products will continue to evolve rapidly because both of these combinations are changing. Novartis, the manufacturer of Maxim, is moving toward a product called Maxim XL, a combination of Maxim and Apron XL. And Gustafson, the distributor of Captan, is moving toward a combination called Corn Treatment System (CTS), which includes Captan and Allegiance.

What are these different fungicides?

Captan is a broad-spectrum contact fungicide that has been used on corn seed for decades. It is usually dyed pink and leaves a pink dust in the seed bag and planter box. It is very effective against a broad range of soil fungi, but its effectiveness against Pythium is fair.

The active ingredient in Apron is metalaxyl, which is a narrow-spectrum, locally systemic fungicide with excellent activity against Pythium. In recent years, it has become standard practice to include this fungicide on corn in combination with a broad-spectrum fungicide. Apron XL is a new product that contains a more active isomer of metalaxyl (mefenoxam), and it is used at about half the rate of Apron.

The active ingredient in Maxim is flulixironil, a new broad-spectrum contact fungicide developed by Novartis. It is very effective against Fusarium and other soil fungi, but not against Pythium. Therefore, it is always used in combination with a good Pythium fungicide. This year, some Maxim XL-treated seed will be planted and this product will soon replace the Maxim+Apron combination that is now used. Maxim-treated seeds appear shinier (and a different color) than Captan-treated seeds and the seed treatment does not dust off the seed as much as Captan does.

The active ingredient in Allegiance is metalaxyl, the same as in Apron. Because of changing patents, eventually Apron will disappear from the market and metalaxyl will be available as Allegiance, and mefenofoxam will be available as Apron XL. This year, about half the Captan-treated seed will be Captan+Apron and half will be the CTS treatment, which includes Captan, Allegiance, and a polymer to greatly reduce dust.
How do the different products compare?

Overall, I have not perceived a difference in field performance between Maxim+Apron and Captan+Apron. So why the predominance of Maxim? The answer is in ease and safety of handling. Maxim is used at a much lower rate than Captan (about 25 times lower), and dust is reported to be 80 percent less than with Captan. These characteristics make Maxim easier and safer to handle in seed production operations, and on the farm.

Because the Pythium fungicide (mefenoxam) now used with Maxim is a new product, there are questions about its performance. We conducted two field trials comparing the performance of Apron and Apron XL, in combination with Maxim or Captan (Table 1). In addition, there have been many other trials conducted by university researchers and seed companies. In our trials, we have seen no difference in corn stand (plants per acre) between the two products, but we have seen higher yields with Apron compared with Apron XL at the standard rates. I have studied the results of 25 other field trials on corn and the stand data also show no difference. The Apron treatment yielded higher than the Apron XL treatment in 15 of the 25 trials, but only twice was the difference statistically significant; the Apron XL treatment yielded better in 10 of the 25 trials. I also have seen results of trials comparing Apron and Apron XL on other crops. These results do not reveal a trend in either direction.

Yield results for seed treatment trials should be interpreted cautiously, especially when differences are not statistically significant. Many factors influence yield in between the time when stand counts are made and the plants are harvested. Yields do not always correlate well with stands, and it is uncertain to what extent seed treatments can influence yield aside from their affect on stand.

Other seed treatments

There are several planter-box seed treatments available for corn that can be used in addition to the commercially applied fungicides. Most planter-box treatments are a combination of an insecticide (usually lindane) and a fungicide, and their best use is for the control of wireworms or seed corn maggots. These products include Kernel Guard, Germate Plus, Agrox, and others. The additional fungicide can sometimes improve stand, but usually this effect is not statistically significant. This year Kernel Guard Supreme will be available. The insecticide component of this product is permethrin instead of lindane.

What else should I do to prevent seedling diseases?

Planting high-quality, fungicide-treated seed goes a long way toward controlling seedling diseases. But other practices can help, too. Crop rotation has limited value for controlling soybean seedling diseases, but there is a benefit for corn seedling diseases. Reducing the amount of crop residue over the seed row also can be helpful (especially if it is corn residue). Planting conditions are important. Do not try to "mud in" your crop just for the sake of planting early. Well-drained soil will have the least risk of seedling disease. Soil temperatures lower than 55°F are conducive to seedling disease development. Although it is not always possible to delay planting until the soil reaches this temperature, you should keep track of soil
temperatures in the spring and consider this in your planting decisions. Herbicide stress contributes to seedling disease development, so be careful!

Table 1. Effects of fungicidal seed treatments on emergence and yield of early-planted corn hybrids in Ames in 1997 and 1998 (corn on corn).

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Emergence (%)</th>
<th>Yield (bu/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>84.7</td>
<td>60.8</td>
</tr>
<tr>
<td>Captan+Apron</td>
<td>94.0</td>
<td>--</td>
</tr>
<tr>
<td>CTS (Captan+Allegiance)</td>
<td>--</td>
<td>90.2</td>
</tr>
<tr>
<td>Maxim+Apron XL</td>
<td>96.7</td>
<td>87.2</td>
</tr>
<tr>
<td>Maxim+Apron</td>
<td>95.3</td>
<td>--</td>
</tr>
<tr>
<td>Maxim+Apron XL+Germate Plus</td>
<td>94.6</td>
<td>85.6</td>
</tr>
<tr>
<td>Maxim+Apron XL+Kernel Guard</td>
<td>100.0</td>
<td>86.8</td>
</tr>
<tr>
<td>Maxim+Apron XL+Kernel Guard Supreme</td>
<td>--</td>
<td>89.8</td>
</tr>
<tr>
<td>Captan+metalaxyl*+Germate Plus</td>
<td>94.2</td>
<td>87.4</td>
</tr>
<tr>
<td>CTS+Kernel Guard</td>
<td>--</td>
<td>91.4</td>
</tr>
<tr>
<td>CTS+Kernel Guard Supreme</td>
<td>--</td>
<td>90.4</td>
</tr>
<tr>
<td>Least significant difference</td>
<td>4.8</td>
<td>6.3</td>
</tr>
</tbody>
</table>


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