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Corn seed treatments in 1998

Gary P. Munkvold
Iowa State University, munkvold@iastate.edu

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Abstract
The snow will be gone soon and it will be time to plant corn. El Niño promises to bring us a cool, wet spring, and this means seedling diseases. If you don’t know which fungicidal seed treatment is on your corn seed, now is a good time to have a look at those labels on the bags and check it out. Recent trends in corn seed treatment are continuing in 1998--most seed has been treated with Maxim+Apron this year instead of the traditional, standard fungicide Captan.

Keywords
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Disciplines
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The snow will be gone soon and it will be time to plant corn. El Niño promises to bring us a cool, wet spring, and this means seedling diseases. If you don't know which fungicidal seed treatment is on your corn seed, now is a good time to have a look at those labels on the bags and check it out. Recent trends in corn seed treatment are continuing in 1998--most seed has been treated with Maxim+Apron this year instead of the traditional, standard fungicide Captan. Some seed companies are using Captan+Apron. Last year, about 40 percent of the corn seed planted in the United States was treated with Maxim+Apron, and the percentage will be substantially higher this year.

What are these different fungicides?

The active ingredient in Captan is, you guessed it, captan. It is an excellent, 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 effective against a broad range of soil fungi, but its effectiveness against Pythium is limited.

The active ingredient in Apron is metalaxyl, 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. The new product Apron XL contains a more active isomer of metalaxyl and is used at a lower rate than the older formulations of Apron.

The active ingredient in Maxim is fludioxonil, 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 Apron. Starting in 1998, a formulation called Maxim XL will be available. This formulation contains the active ingredients of both Maxim and Apron XL. 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 with Captan.

Why are seed companies switching to Maxim+Apron?

Overall, there is no difference in field performance between Maxim+Apron and Captan+Apron. In some field tests, one combination has been somewhat better than the other, but these differences are not consistent. So why the switch? 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.
Many comparisons have been made between Maxim+Apron and Captan+Apron. We conducted tests in 1995 and 1997 and our results were consistent with those of most other university researchers and seed companies--there were no significant differences between the two combinations (Table 1).

In laboratory tests against specific pathogens, some differences between Captan and Maxim can be observed. For example, Maxim appears to be superior against certain strains of *Fusarium*. There may be other fungi against which Captan has an advantage. This means that in a specific field it might be possible to see a difference in performance between the two products. However, this is not predictable, and the weight of evidence shows no difference in field performance, which is the bottom line.

**Other information**

One possible disadvantage with Maxim-treated seed is that with finger-type planters and flat seeds, there is sometimes a lower-than-expected seed drop. Apparently, this is because Maxim-treated seed is more slippery than Captan-treated seed. The planter can be adjusted to compensate for the problem, but it is important to be aware that this might be necessary. No problems have been reported with other types of planters or other seed sizes. Future formulations of Maxim XL will contain a polymer that should alleviate this potential problem.

Captan will remain an effective option for corn seed treatment. New formulations of Captan (a Gustafson product) will include a polymer component designed to minimize dust.

**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 below 55° F are conducive to seedling disease development. Although it is not always possible to delay planting until the soil reaches a temperature above 55° F, you should keep track of soil temperature in the spring and consider it in your planting decisions. Herbicide stress contributes to seedling disease development, so be careful!

On-farm seed treatments such as Kernel Guard, Germate Plus, and Agrox are available for additional seed protection. They usually contain a combination of a fungicide and an insecticide. These products are usually not needed for added disease control. Their primary benefit is for insect control. However, under some conditions, the additional fungicide can improve emergence.

**Table 1. Effects of fungicidal seed treatments on emergence of early planted corn hybrids in Ames in 1995 and 1997. Differences between Captan+Apron and Maxim+Apron were not statistically significant.**

<table>
<thead>
<tr>
<th></th>
<th>Emergence</th>
</tr>
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<tbody>
<tr>
<td>1995 (on)</td>
<td>1995 (on)</td>
</tr>
<tr>
<td>1995 (on)</td>
<td>1997 (on)</td>
</tr>
<tr>
<td>Treatment</td>
<td>corn) Planted May 2</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>None</td>
<td>13.1</td>
</tr>
<tr>
<td>Captan</td>
<td>70.4</td>
</tr>
<tr>
<td>Captan+Apron</td>
<td>80.8</td>
</tr>
<tr>
<td>Maxim+Apron</td>
<td>75.1</td>
</tr>
<tr>
<td>Maxim+Apron+ Germate Plus</td>
<td>--</td>
</tr>
<tr>
<td>Maxim+Apron+ Kernel Guard</td>
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</tbody>
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*Data courtesy of Joseph Burris, Iowa State University, Department of Agronomy.

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