CROP INSIGHTS

PIONEER
A DUPONT COMPANY

New Premium Pioneer Seed Treatment With Dynasty[1] Fungicide

by Steve Butzen and Tom Doerge

Summary

- Pioneer is offering a new seed treatment option of Dynasty[1] fungicide plus Poncho[2] seed-applied insecticide. Pioneer believes that this combination is the premier seed treatment for corn stand establishment in the industry.
- This treatment will also include the standard Maxim[1] XL fungicide and a new seed treatment polymer that further improves seed plantability and reduces dust-off.
- Dynasty (azoxystrobin) is a new seed treatment fungicide from Syngenta that provides additional control of seed-borne and soil-borne fungi causing decay, damping-off and seedling blight from Rhizoctonia, Pythium, Fusarium and Penicillium.
- Adding Dynasty in combination with a neonicotinoid insecticide seed treatment (IST) like Poncho 250 or Poncho 1250 provides greater early season pest and stand protection than just adding an IST or Dynasty alone.
- Pioneer's new seed treatment combination is ideal for difficult emergence environments such as early planting, high-residue farming systems, and fields with a history of seedling diseases, soil insect damage and stand establishment problems.
- This seed treatment will be available across all Pioneer hybrids and maturities. However, Dynasty is not yet registered in Canada.
- This Crop Insights will describe Dynasty fungicide, the combination with ISTs, and research results that demonstrate improved stand establishment.

Introduction

Pioneer is introducing a new seed fungicide for corn hybrids in 2006 – Dynasty. This product was developed by Syngenta as an additional fungicide that can be used in combination with an insecticide seed treatment (IST) to provide a greater spectrum of early season pest control.

Pioneer will offer Dynasty fungicide as part of a seed-treatment combination with Poncho 250 or Poncho 1250 ISTs. This treatment will also include the standard Maxim XL fungicide and a new seed treatment polymer that further improves seed plantability and reduces dust-off. This new seed treatment package is ideal for ***difficult emergence environments*** such as early planting, high-residue farming systems, and fields with a history of seedling diseases, soil insect damage and stand establishment problems.

Corn seedling showing severe symptoms of seedling disease.

Dynasty has activity against soil fungi that cause corn seedling diseases, including the most common damping-off organism, Pythium. Pioneer believes that Dynasty fungicide with Poncho 250 or Poncho 1250 insecticide combined with the standard Maxim XL fungicide is the premier seed treatment for corn stand establishment in the industry.

Early Planting and Stand Establishment

Earlier planting has intensified corn stand establishment problems in recent years. Pioneer surveys have shown that farmers start their corn planting about one week earlier than they did 10 years ago. And because today's larger equipment and reduced tillage farming systems allow more acres to be planted per day, a majority of corn acres are planted nearly 10 days earlier than just a decade ago.

As a result, stand establishment problems have increased in recent years. These problems are not limited to northern areas or heavy soils traditionally associated with Pythium or other seedling disease issues. Rather, these problems have occurred across a wide range of geographies from Colorado to the Atlantic, and from the most northern states to Kentucky and Tennessee. In fact, high residue tillage

Corn seedling showing initial symptoms of seedling disease – radicle deterioration and seminal roots showing rot.

systems and earlier planting have created environments at risk for stand establishment problems practically everywhere corn is grown in the U.S. and Canada.

Dynasty Technical Information

Dynasty seed treatment is a formulation of azoxystrobin, a broad-spectrum fungicide also used as a foliar application for many crops. According to the product label, Dynasty targets seed-borne and soil-borne fungi causing decay, damping-off and seedling blight from Rhizoctonia, Pythium, Fusarium and Penicillium.

Dynasty was developed to be used as a co-fungicide with Maxim XL or Apron[1] XL in combination with an insecticide seed treatment. According to the manufacturer, the combination supplies a higher level of activity on Fusarium and Pythium, and also provides post-emergent Rhizoctonia protection. The manufacturer also states that studies have shown improved plant stand, vigor and yield for the combined fungicide compared to Maxim XL alone.

Pioneer On-Farm Research Results

Pioneer conducted research in 40 side-by-side strip plots on farmer's fields in both 2004 and 2005 to determine the value of adding Dynasty to the standard seed treatment mix. These large, on-farm plots were located in critical seedling blight areas in Iowa, Illinois, Indiana, Ohio and Michigan. Treatments included:

Treatment 1 - Maxim XL + IST

Treatment 2 - Maxim XL + Dynasty + IST

In 2004, excellent conditions for emergence resulted in fewer seedling disease problems and little difference between seed treatments. In 2005, greater early season stresses resulted in more reports of corn seedling diseases and stand establishment issues. Results of the Pioneer study are shown in Figure 1.

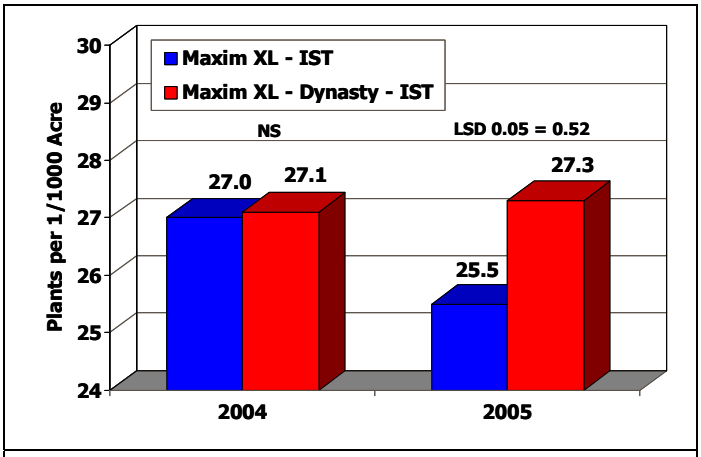

Figure 1. Corn stand establishment for two seed treatments: Maxim XL + IST vs. Maxim XL + Dynasty + IST. 40 on-farm locations each year in Iowa, Illinois, Indiana, Ohio and Michigan.

As the graph demonstrates, addition of Dynasty to the seed treatment mix resulted in significantly higher stands in 2005, but not in 2004. When stresses accompany planting and corn emergence, Dynasty offers additional protection against stand reduction due to seedling diseases from Pythium, Fusarium and Rhizoctonia infection.

Another measure of the value of a seed treatment is how often the treatment prevents significant stand loss and possible replant when stressful conditions occur after planting (Table 1.)

Table 1. Number and % of test locations in 2005 resulting in stand increases greater than 2000 and 4000 plants/acre.

Treatment	Stand Improvement > 2000 plants/acre*	Stand Improvement > 4000 plants/acre*
	- - - - - - No. of locations (% of total) - - - - - -	
+ Dynasty*	18 (45%)	4 (10%)

*Maxim XL + Dynasty + IST compared to Maxim XL + IST.

The addition of Dynasty resulted in stand improvements of 2000 plants/acre or more in 18 of 40 locations, and improvements of 4000 plants or more in 4 of 40 locations.

Additional Research Results

Several recent research studies have indicated that increased activity may result when a strobilurin fungicide such as Dynasty is combined with a neonicotinoid insecticide seed treatment like Poncho.

Kansas State University research demonstrates both the value of Dynasty and neonicotinoid ISTs in increasing

fungicidal activity of seed treatments, and thereby increasing plant stands of corn (Figures 2 and 3.)

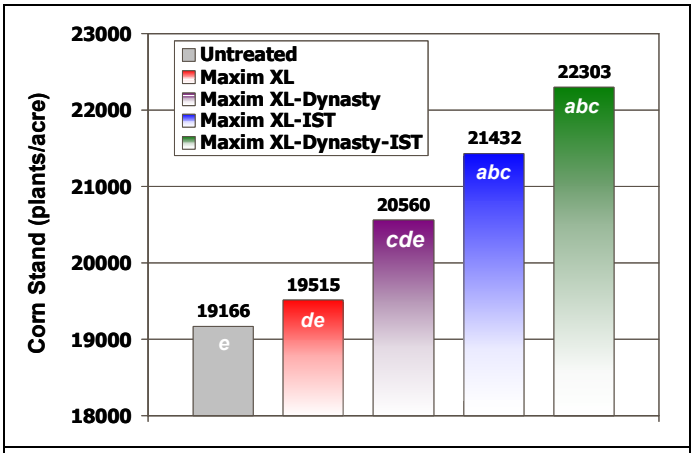

Figure 2. Effect of various seed treatments on corn stand establishment. Parsons, KS, 2003. Kansas State University.

As figure 2 shows, addition of Dynasty to Maxim XL increased stands by over 1000 plants/acre, although this difference was not statistically significant. Addition of an insecticide seed treatment to Maxim XL increased stands by nearly 2000 plants/acre over Maxim XL alone, which was statistically significant. Highest stands were obtained by adding a combination of Dynasty and an IST to the seed treatment mix. A similar experiment was conducted in 2004 (Figure 3).

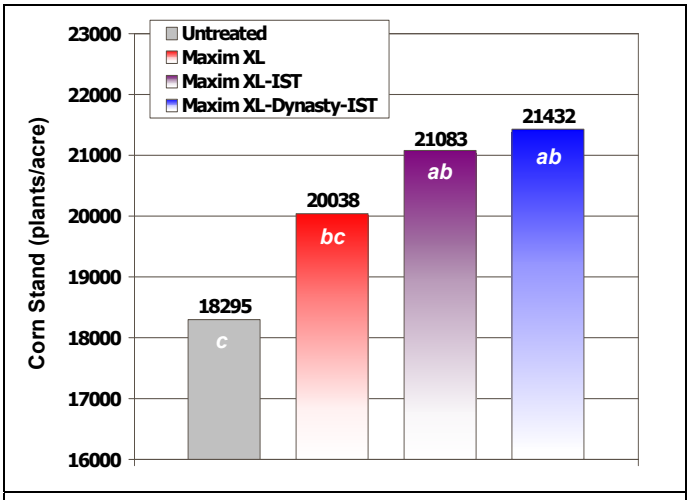

Figure 3. Effect of various seed treatments on corn stand establishment. Parsons, KS, 2004. Kansas State University.

2004 results were very similar to those of 2003. Incremental stand increases were achieved by adding Dynasty and insecticide seed treatments to the base Maxim XL treatment.

Agri-Tech Consulting of Janesville, Wisconsin also tested seed treatments in 25 field trials (Figure 4). Addition of Dynasty increased stands by 2400 plants/acre. Addition of Dynasty and a mid-rate (0.25 mg/kernel) IST increased stands by 4500 plants/acre over Maxim XL.

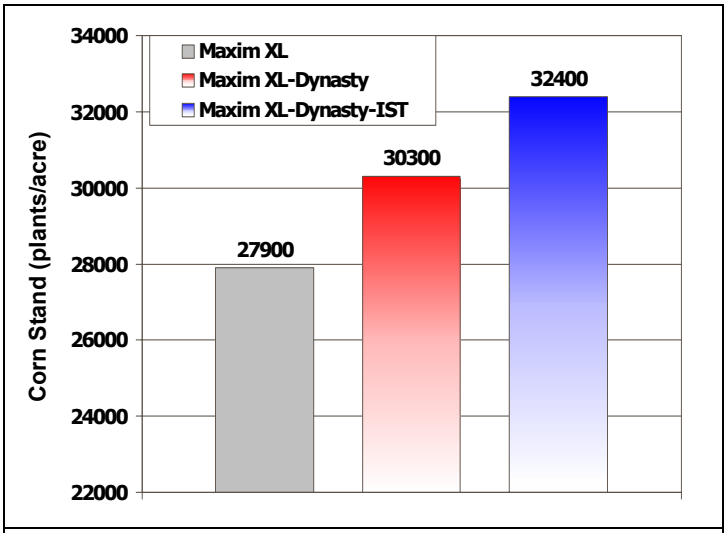

Figure 4. Effect of seed treatments on corn stand establishment. Average of 25 field studies. Courtesy of Tim Maloney, Agri-Tech Consulting, Janesville, WI.

Poncho Insecticide Seed Treatments

Pioneer's 2006 offering for stress emergence environments will include the standard Maxim XL fungicide and the premium combination of Dynasty fungicide plus either Poncho 250 or Poncho 1250 ISTs. These ISTs add control of most seed-damaging soil insects common in no-till, high residue, and other stressful emergence environments. Soil insects can be particularly problematic under cool soil conditions that slow growth of corn and reduce the seedling's ability to outgrow insect feeding damage. More information on insect control of Poncho 250 and Poncho 1250 is included below.

Poncho 250 IST

Poncho 250 IST is a formulation of clothianidin, a broad-spectrum, systemic neonicotinoid insecticide. Applied at a rate of 0.25 mg active ingredient per kernel, this product delivers early-season protection against wireworm, white grub, seedcorn maggot, flea beetle, grape colaspis, chinch bug and black cutworm, according to the manufacturer's label. Because it comes on the seed and in the bag, Poncho 250 has advantages in convenience and safety over soil insecticides or hopper-box treatments.

Poncho 1250 IST

Poncho 1250 insecticide seed treatment, a formulation of clothianidin applied at a rate of 1.25 mg/kernel, was first introduced on Pioneer corn hybrids in 2004. The primary pest target for Poncho 1250 is corn rootworm (CRW), but in addition, it offers the broadest insect protection available in a seed-applied insecticide for a number of other problematic insects. Secondary soil insects on the Poncho 1250 label include wireworm, white grub, grape colaspis, and seedcorn maggot. Above-ground insects are billbug, chinch bug, flea beetle and black cutworm.

Poncho 1250 has proven effective in low and moderate corn rootworm infestations, but is not necessarily recommended under high infestations. Poncho 1250 eliminates the cost and time required to install soil-applied insecticide equipment, calibrate equipment and load products during planting, and handle and return insecticide containers.

[1]Maxim, Apron and Dynasty are registered trademarks of Syngenta.

[2]Poncho is a registered trademark of Bayer AG.