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Planting Date and Polymer-Coated Seed Effects on Corn

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Abstract
This project is designed to study the effect polymer-coated seed has on corn emergence and yield. The coating technology used is the Intellicoat® Early Plant Seed Coating Technology. Intellicoat is derived from natural, biodegradable fatty acids that act as temperature-sensitive switches. Thus when soil temperatures warm above 55°F for several days the polymer allows water to permeate the seed and germination proceeds. There is interest in this technology because it opens up the window for earlier planting. Often in southeast Iowa it is dry enough to plant during the second half of March or the first half of April, but producers usually wait because the soil is too cool. Unfortunately, when soils do warm later in the spring, wet conditions may occur as well, resulting in planting delays. The Intellicoat technology is designed to allow producers the opportunity to plant when soils are cool but otherwise fit.

Disciplines
Agricultural Science | Agriculture

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Introduction

This project is designed to study the effect polymer-coated seed has on corn emergence and yield. The coating technology used is the Intellicoat® Early Plant™ Seed Coating Technology. Intellicoat is derived from natural, biodegradable fatty acids that act as temperature-sensitive switches. Thus when soil temperatures warm above 55°F for several days the polymer allows water to permeate the seed and germination proceeds.

There is interest in this technology because it opens up the window for earlier planting. Often in southeast Iowa it is dry enough to plant during the second half of March or the first half of April, but producers usually wait because the soil is too cool. Unfortunately, when soils do warm later in the spring, wet conditions may occur as well, resulting in planting delays. The Intellicoat technology is designed to allow producers the opportunity to plant when soils are cool but otherwise fit.

Materials and Methods

The second year of this study at the Southeast Research and Demonstration Farm was 2003. The study was planted no-till into soybean stubble. A John Deere 7000 planter was set to plant 32,000 seeds/acre in 30-inch rows. Attachments included Yetter bubble-type coulter blades and Martin residue managers. Soil samples suggested that the phosphorus and potassium levels were low, so a 16-64-32 starter was applied using Yetter no-till dry starter attachments. In addition, 150 pounds of nitrogen (28% UAN) was dribble-banded next to each row after the corn emerged. The soil samples also suggested that the soil pH was somewhat low (soil pH of 5.60), but no lime was applied.

The study was randomized and replicated three times. A fourth block was used for demonstration purposes and was not randomized. A representative from the Landec Ag Company chose the corn hybrids that were planted. Both polymer-coated and non-coated seed from two hybrids were planted; all seed types had the same fungicide treatment applied to them. Initially, each seed type was to be planted at approximately ten-day intervals throughout the spring, but weather conditions delayed some plantings.

Results and Discussion

Planting conditions were somewhat wet for the first planting date but were good for the remaining dates. The polymer-coated and non-coated seed emerged at the same time for the first two planting dates as shown in Tables 1 and 2. Soil temperatures did not rise above 55°F for more than two days until April 14. This was most likely the trigger for allowing moisture to permeate the polymer-coated seed and for germination to begin. These warm conditions seemed to also allow the non-coated seed to germinate at the same time during the first two planting dates. On the other hand, the polymer-coated seed emerged one day later than the non-coated seed for the last two planting dates. Not surprisingly, though, both the polymer-coated and non-coated seed required fewer days to emerge when planted later in the spring.

Population counts at approximately the V5 growth stage revealed that numerically the polymer-coated seed had slightly better stands when compared with the non-coated seed treatments. The only exception was the April 16th planting date of the EX22 hybrid as shown in Table 2. Yields were numerically better for the polymer-coated treatments in the first two planting dates compared with the non-coated treatments as shown in Table 3. However, this

trend was reversed for the last two planting dates suggesting that this polymer-coating technology performed better during the early planting window compared with the traditional window of non-coated seed. Nevertheless, yields in general numerically decreased when planting was delayed into mid-May.

The Intellicoat technology performed satisfactorily in this study when planted early. However, wet conditions during the first planting date may have reduced the potential yield of these hybrids early on. Still, yields were best for the first three planting dates and then dropped off in the fourth planting date. And, as in 2002, conditions were good enough to allow non-coated seed to perform satisfactorily as well. Consequently, more research is needed to see how this technology performs under less-than-ideal conditions.

Acknowledgments

Appreciation is extended to Chad Hesseltine and Jared Anderson, research farm staff, for their assistance with this study. Intellicoat® and Early Plant™ Seed Coating Technology are trademarks of Landec Ag, Inc. No endorsement is intended of the seed coat polymer used in this study, nor is criticism implied of polymers not used.

Table 1. Corn emergence* and population of hybrids EX13 as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2003.**

Planting date	Date emerged/population (non-coated seed)	Date emerged/population (coated seed)	Days to emergence non-coated/coated
March 24	April 28 / 30,800 ppa	April 28 / 31,000 ppa	35/35
April 3	April 30 / 30,800 ppa	April 30 / 32,800 ppa	27/27
April 16	May 6 / 31,800 ppa	May 7 / 32,900 ppa	20/21
May 17	May 27 / 30,300 ppa	May 28 / 33,300 ppa	10/11

*Emergence recorded when approximately 75% of plants emerged.
**Plants per acre (ppa) at approximately V5 growth stage.

Table 2. Corn emergence* and population of hybrid EX22 as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2003.**

Planting date	Date emerged/population (non-coated seed)	Date emerged/population (coated seed)	Days to emergence non-coated/coated
March 24	April 28 / 29,000 ppa	April 28 / 31,300 ppa	35/35
April 3	April 30 / 28,400 ppa	April 30 / 31,600 ppa	27/27
April 16	May 6 / 31,400 ppa	May 7 / 30,100 ppa	20/21
May 17	May 27 / 31,100 ppa	May 28 / 32,000 ppa	10/11

*Emergence recorded when approximately 75% of plants emerged.
**Plants per acre (ppa) at approximately V5 growth stage.

Table 3. Corn grain yield as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2002.

Planting date	Non-coated/coated seed (bu/acre, Hybrid EX13)	Non-coated seed/coated seed (bu/acre, Hybrid EX22)
March 24	211.3/211.9	214.7/217.8
April 3	214.0/217.6	220.3/229.5
April 16	216.6/211.2	228.3/220.6
May 17	197.2/193.2	206.5/191.6