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Planting Date and Polymer-Coated Seed Effects on Corn

Abstract
This project is designed to study the effect of planting polymer-coated seed throughout the season on its emergence and subsequent corn 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.

Disciplines
Agricultural Science | Agriculture

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Planting Date and Polymer-Coated Seed Effects on Corn

James Jensen, farm management specialist
ISU Extension
Kevin Van Dee, farm superintendent

Introduction

This project is designed to study the effect of planting polymer-coated seed throughout the season on its emergence and subsequent corn 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 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 first year of this study at the Southeast Research and Demonstration Farm was 2002. The study was planted with 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. Anhydrous ammonia (125 lbs of N) was applied in the fall. Soil samples suggested that no additional fertilization was necessary. However, these samples also suggested that the soil pH was somewhat low (soil pH of 5.85), but lime was not applied.

The study was randomized and replicated three times. A fourth block was used for demonstration purposes and was not randomized. The extension farm management specialist chose the corn hybrid that was planted. Both polymer-coated and non-coated seed from the same hybrid were planted, and both seed types had the same fungicide treatment applied to them. Each seed type was planted at approximately two-week intervals throughout the spring.

Results and Discussion

Planting conditions were good for all five planting dates. The first three dates all emerged at about the same time, although emergence periods decreased for each of the subsequent dates as shown in Table 1. Soil temperatures did not rise above 55°F until April 14. From April 14 through April 20 the average soil temperature was 61.8°F. Conditions were nearly ideal, and both coated and non-coated seed emerged well. The last two planting dates emerged quickly, but there was a three to four day delay in emergence with the coated seed. The coated seed in these later plantings emerged somewhat less evenly as well.

Population counts at approximately the V5 growth stage revealed that there was little difference in the coated or non-coated seed treatments. Population stands generally improved in the later plantings; however, this did not improve yields.

Yields were similar for both the coated and non-coated seed treatments as shown in Table 2. The only exception to this was the first planting date where the non-coated seed out-yielded the coated seed treatment. Yields generally decreased as planting was delayed, although the majority of the decline occurred between the third and fourth planting dates.

The Intellicoat technology performed satisfactorily in this study when planted early. However, conditions were good enough to also allow non-coated seed to perform well. There is also some question about the uneven emergence we experienced in the later plantings of the coated seed, but because the uneven emergence did not affect yield this might not be a concern. Nevertheless, more research is needed to see how this technology performs under less-than-ideal conditions.

Acknowledgments

Appreciation is extended to Matt Hunt and Chad Hesseltine, 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 coated polymer used in this study, nor is criticism implied of polymers not used.

Table 1. Corn emergence* and population as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2002.**

Planting date	Date emerged/population (non-coated seed)	Date emerged/population (coated seed)	Days to emergence (non-coated/coated)
March 15	April 22 / 27,300 ppa	April 22 / 25,300 ppa	38/38
April 1	April 22 / 28,400 ppa	April22 / 25,900 ppa	21/21
April 11	April 25 / 33,000 ppa	April25 / 28,600 ppa	14/14
May 4	May 20 / 31,800 ppa	May24 / 33,100 ppa	16/20
May 20	May 31 / 34,900 ppa	June 3 / 32,600 ppa	11/14

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

Table 2. Corn grain yield as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2002.

Planting date	Non-coated seed (bu/a)	Coated seed (bu/a)
March 15	194.7	181.6
April 1	189.2	184.5
April 11	187.7	185.6
May 4	161.8	158.2
May 20	165.2	169.0