

Soybean Planting Date and Seed Treatment Trial

RFR-A1987

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Introduction

Twenty years ago, less than three percent of soybean planted in Iowa used a seed treatment. As planting dates moved earlier into April, seedling diseases like damping-off were an increased concern, thus fungicide seed treatments were recommended for these early plantings to promote improved stand establishment. Then followed occasional concerns with seedcorn maggot, true white grubs, bean leaf beetle, and soybean aphid to suggest possible benefits with the use of an insecticide seed treatment.

More recent has been the development of seed treatments to help control sudden death syndrome and nematode activity. Therefore, the agribusiness industry has expanded from the commonly used fungicide seed treatment to various premix seed treatments with two or more components such as fungicides, insecticides, nematicides, and biologicals.

Currently, more than 50 percent of soybean planted in Iowa use a seed treatment. Driving forces for such change includes increased seed cost, striving to maximize stand emergence with lower seeding rates, early spring planting, and crop scouting to recognize recent unique potential threats within given fields such as insect pest damage, areas of poor drainage, and sudden death syndrome.

Several kinds of fungi cause seed rot, seedling rot (damping-off), and seedling disease. The most common ones in Iowa are *Rhizoctonia* and *Fusarium*, the water mold fungi *Pythium* and *Phytophthora*, and seed-borne *Phomopsis*.

Soybean plantings from early April to early May often yield similar, but early planting is still commonplace to balance heavy labor demand and risk of weather-related planting delays. The chance of having to replant due to late spring frost is offset by the chance of planting all crops in a timely manner. As spring planting progresses and planting is delayed, a common question that arises is if seed treatments benefit later planted soybean. This trial compares the use of a multiple component seed treatment across four planting dates to investigate this question.

Materials and Methods

This study was conducted at the ISU Northeast Research Farm, Nashua, Iowa, in 2019 on Kenyon-Floyd-Clyde soil. The site was a corn-soybean rotation, fertilized in fall to meet ISU soil fertility recommendations. Field preparation included a fall pass with a Kuhn-Krause 5830 in-line ripper and spring field cultivation. The field then was planted with a Kinze 3000 planter at 30-in. rows and received an application of Zidua at 3 oz/acre. The four planting dates were April 21, May 4, May 16, and June 1. Postemergence weed control was achieved with an application of 32 oz/acre Roundup PowerMax and 6 oz/acre of Select. Plots were harvested October 9 with a John Deere 4420.

The plots were setup in a split plot statistical design with four replications. The seed treatments were an untreated control and a DuPont™ Lumisena™ seed treatment containing Evergol Energy SB at 0.5 oz/140k, Lumisena 200 FS at 0.285 oz/140k, ILeVO 600 FS at 1.18 oz/140k, Gaucho 600 at 0.8 oz/140k, and PPST 2030 at 1 oz/140k.

Results and Discussion

Planting dates. Statistically significant differences in yield with seed treatments only

occurred for the planting dates of May 4 and June 1. This trial showed a benefit to seed treatment, but not a trend in benefit towards early planting dates. More trials are needed to determine if such a trend exists.

Other pest issues. The seed treatment included protection against seed/soil borne fungi, soil insects, early season bean leaf beetle, soybean aphid, and sudden death syndrome. However, the trial site in 2019 did not experience any noticeable abnormal events with soil fungal or insect pests. There was a low-level, irregular occurrence of sudden death syndrome across the trial site.

Planting when soil conditions are not optimal ultimately will lead to reduced plant emergence, lower plant populations, and possibly yield reductions, regardless of seed treatment use. Always wait for proper field conditions before planting.

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Table 1. Soybean grain yield and harvest moisture with or without seed treatment across four planting dates at the ISU Northeast Research Farm, Nashua, IA.

Planting date	Grain yield ¹	Harvest moisture ¹
Untreated	bu/ac	%
April 21	55.8 bcd	13.6 a
May 4	55.5 cd	13.5 a
May 16	56.5 abc	13.3 a
June 1	51.9 d	13.3 a
Average	54.9	13.4
Treated		
April 21	59.7 ab	13.4 a
May 4	60.1 a	13.6 a
May 16	57.8 abc	13.5 a
June 1	57.0 abc	13.5 a
Average	58.6	13.5
LSD _{0.05}	4.0	0.5

¹LSD_{0.05} = least significant difference. Entries in a column that differ by one LSD or more are considered to be different with 95 percent certainty. Entries with the same letter are not considered to be significantly different.