



Response of DEKALB® Brand Corn Products to High pH Soils

Trial Objective

Corn products vary in their tolerance to soil pH and can be considered low tolerant, semi-tolerant, or tolerant to the effects of high soil pH (7.6 or higher). Key nutrients, including iron, are tied up and unavailable in high alkaline soils. Products with a low tolerance to soils with a high pH can express iron deficiency chlorosis (IDC) resulting in symptoms such as yellow leaves, interveinal chlorosis, and stunted growth. A better understanding of product performance under varying soil pH conditions is important for positioning products to help maximize yield potential.

In Western Kansas and Eastern Colorado, the source of the high soil pH is excess lime from high calcium carbonate concentrations in the soil parent material resulting from eroded sidehills and cut areas in fields. The objective of this ongoing trial is:

- To determine the visual and yield response of a range of different corn products to high pH (7.6 to 8.5) soils.

Experiment/Trial Design

- For this trial, 40 corn products of varying relative maturities (RMs) were planted in one pH block in the field.
 - » 4 products had RMs ranging from 93-day to 97-day (95 RM group).
 - » 10 products had RMs ranging from 98-day to 102-day (100 RM group).
 - » 10 products had RMs ranging from 103-day to 107-day (105 RM group).
 - » 9 products had RMs ranging from 108-day to 112-day (110 RM group).
 - » 7 products had RMs ranging from 113-day to 114-day (115 RM group).
- 21 of these products were DEKALB® RIB Complete® brand blend corn products; only the results of the DEKALB® brand products are shown in this report.

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Goodland, KS	Silt Loam	Corn	Strip Tillage	5/24/23	10/27/23	215	30,000
Idalia, CO	Silt Loam	Corn	Strip Tillage	5/25/23	10/20/23	220	30,000

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- A visual color rating (Figure 1) of the foliage was taken at the V8 and VT growth stages:
 - » Very dark green = 2
 - » Pale yellow = 8
- Each product was replicated 4 times.
- Soil pH was determined by grid sampling each trial area at a 1/10th acre density.



Figure 1. Visual color rating with pale yellow = 8 and vary dark green = 2. Ratings were taken at V8 and VT growth stages.

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Understanding the Results

The corn products in the trial varied for high pH tolerance. Five products were visually rated as above average, highly recommended; ten were rated above average, recommended in most situations; five were rated as average, recommended in some situations; and one was rated below average, not recommended (Table 1).

DEKALB® Brand Blend Product	Relative Maturity (RM) Grouping	High pH					Neutral pH		
		Average Yield (bu/acre)	RM Average Yield (bu/acre)	Delta To RM Group (bu/acre)	V8 Visual Rating Score	VT Visual Rating Score	Average Yield (bu/acre)	RM Average Yield (bu/acre)	Delta To RM Group (bu/acre)
DKC45-74RIB	95	157.0	159.5	-2.5	4.0	4.0	184.7	187.3	-2.6
DKC47-84RIB	95	155.6	159.5	-3.9	4.4	3.9	190.0	187.3	2.7
DKC48-34RIB	100	160.0	159.5	0.5	3.6	3.5	177.3	194.9	-17.6
DKC098-55RIB Silage Specific	100	174.0	175.4	-1.4	4.5	4.5	203.7	194.9	8.8
DKC098-88RIB	100	197.2	175.4	21.8	4.8	4.6	191.2	194.9	-3.7
DKC099-11RIB	100	177.2	175.4	1.8	4.0	3.8	187.5	194.9	-7.4
DKC101-33RIB	100	174.1	175.4	-1.3	5.0	5.1	214.1	194.9	19.2
DKC102-13RIB	100	164.1	175.4	-11.3	4.9	4.9	188.8	194.9	-6.1
DKC103-07RIB	105	179.2	166.8	12.4	4.4	4.4	220.1	194.4	25.7
DKC103-47RIB	105	188.3	166.8	21.5	4.3	4.1	196.9	194.4	2.5
DKC54-38RIB	105	150.0	166.8	-16.8	6.3	5.9	179.4	194.4	-15.0
DKC105-33RIB	105	168.8	166.8	2.0	4.0	4.1	199.2	194.4	4.8
DKC107-33RIB	105	157.4	166.8	-9.4	4.0	4.1	213.3	194.4	18.9
DKC108-64RIB	110	190.9	179.6	11.3	3.9	3.9	220.6	214.4	6.2
DKC110-10RIB	110	188.2	179.6	8.6	4.9	4.9	218.6	214.4	4.2
DKC111-33RIB	110	167.5	179.6	-12.1	4.0	3.9	195.5	214.4	-18.9
DKC61-40RIB	110	163.3	179.6	-16.3	3.9	4.0	214.9	214.4	0.5
DKC62-69RIB	110	175.7	179.6	-3.9	3.6	3.6	200.9	214.4	-13.5
DKC64-64RIB	115	170.9	166.8	4.1	4.0	4.0	207.8	193.0	14.8
DKC115-33RIB	115	184.6	166.8	17.8	3.9	3.8	197.3	193.0	4.3
DKC115-81RIB	115	159.6	166.8	-7.2	4.1	4.0	212.5	193.0	19.5

Above Average - Highly Recommended
Above Average - Recommended in Most Situations
Average - Recommended in Some Situations
Below Average - Not Recommended

Corn products listed in Table 1: SmartStax® RIB Complete® corn blend, Trecepta® RIB Complete® corn blend, SmartStax® PRO RIB Complete® corn blend, VT Double PRO® RIB Complete® corn blend, VT4PRO™ RIB Complete® corn blend



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Key Learnings

- High pH soils are typically found in areas with eroded topsoil and topography changes. In those situations, it can be difficult to compare yield potential between neutral and high pH areas of the field. Producers need to keep this in mind while making yield comparisons on their own farm.
- The importance of selecting a product that can tolerate high pH soils varies based on the proportion of high pH soil acres in each field and the range in pH within each field.
- The pH tolerance of any corn product is indicated by a visual color rating. However, color expression can also be influenced by other abiotic factors such as soil temperature, nutrient availability, and nutrient uptake. Producers should assess all potential problems when evaluating product performance under high pH soils and when selecting specific products for their fields.

Legal Statements

The information discussed in this report is from a multiple site, replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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The recommendations in this material are based upon trial observations and feedback received from a limited number of growers and growing environments. These recommendations should be considered as one reference point and should not be substituted for the professional opinion of agronomists, entomologists or other relevant experts evaluating specific conditions.

IMPORTANT IRM INFORMATION: Certain products are sold as RIB Complete® corn blend products, and do not require the planting of a structured refuge except in the Cotton-Growing Area where corn earworm is a significant pest. Products sold without refuge in the bag (non-RIB Complete) require the planting of a structured refuge. **See the IRM/ Grower Guide for additional information. Always read and follow IRM requirements.**

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