Nebraska On-Farm Research Network

Years:	1995-2012
Title:	Lime Use on Acid Soils
Crop:	Corn (95, 97, 99, 01, 03, 05, 07, 09, 11) Soybeans (96, 98, 00, 02, 04, 06, 08, 10, 12)
Study ID:	018177199501M18
County:	Washington
Objective:	To determine & document the profitability of using lime on acid soil in a corn/soybean rotation.
Soil Type:	Marshall
Treatments:	No lime vs. lime according to soil test @ 2.5 ton/acre (prorated $44/7 years). Soil pH: 5.5

Nebraska Soybean & Feed Grains Profitability Project

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Summary

Results: pH 5.6/6.3

Crop	Year	No Lime	Lime	Prob >/T/
Corn	1999	145	149	.177 ns
Soybeans	2000	37	43	.0001 ***
Corn	2001	130	132	.657 ns
Soybeans	2002	43	50	.0003 ***
Corn	2003	88	99	.016 **
Soybeans	2004	41	44	.0067 ***
Corn	2005	145	147	.31 ns
Soybeans	2006	53	57	.0186 **
Corn	2007	121	119	.256 ns
Soybeans	2008	40	45	.0009 ***
Corn	2009	212	204	.234 ns
Soybeans	2010	49	62	.0292 **
Corn	2011	192	185	.1223 ns
Soybeans	2012	29.9	34.3	.0234 **

*** Significant at the 90% confidence level**

**** Significant at the 95% confidence level**

***** Significant at the 99% confidence level**

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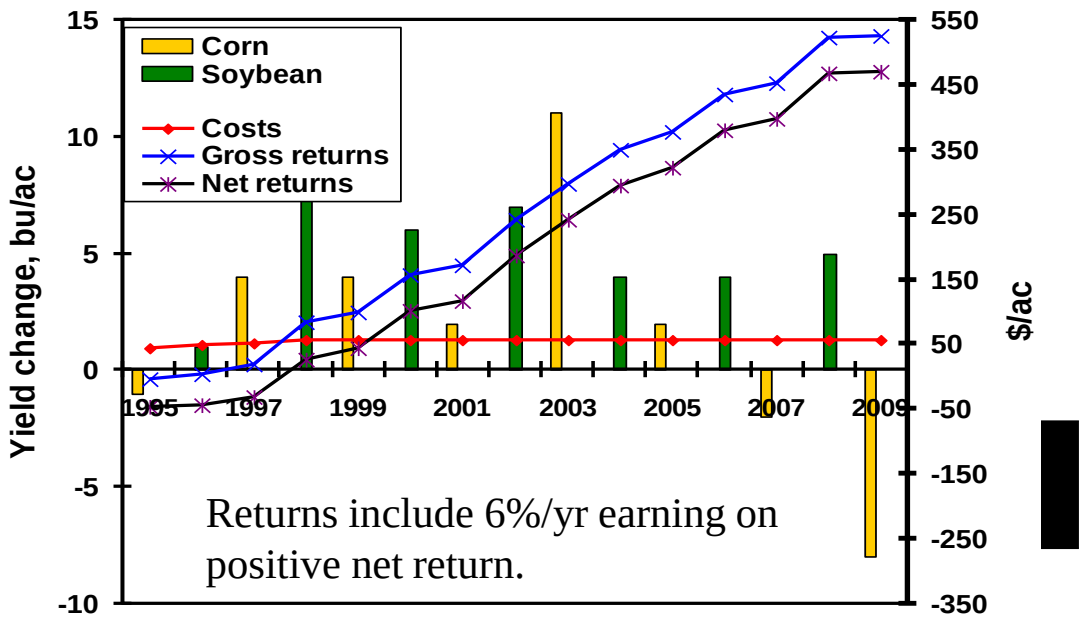
Lime use to amend acid soils



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Summary: A 2-ton lime application with a 7-year life expectancy was applied in spring 1995. A significant difference was detected between test weights at the 90% confidence level in 1995. In 1996, there was a significant difference in moisture content of seed at harvest. In 1997, the use of lime increased corn grain yield slightly. In 1998, lime increased seed yield of soybeans significantly; however, seed test weight was reduced. In 1999, lime reduced grain moisture at harvest and resulted in a slightly lower test weight. In 2000, the lime application resulted in higher seed yield, slightly higher moisture, and slightly higher seed test weight. In 2001, grain moisture was lower at harvest where lime had been applied. In 2002, seed yield of soybeans was increased significantly by lime. In 2003, grain yield of corn was increased and grain test weight was higher where lime had been applied. Seed yield was again higher in 2004 where lime had been applied in 1995. Lime application had no effect on corn in 2005; however, soil pH was still higher where lime had been applied. In 2006, soybean seed yield was significantly higher where lime had been applied. The grain moisture of corn was significantly lower at harvest in 2007 where lime had been applied. Soil pH was higher in the fall of 2007 where lime had been applied and soybean seed yield in 2008 was significantly higher from lime application. Yield of corn was not significantly effected in 2009 from lime application; however, grain moisture at harvest was lower and test weight was higher where lime had been applied. In 2010, the seed yield of soybeans was increased significantly by the application of lime. The 2011 corn yields were not statistically different. As in previous years, soybeans responded positively in 2012 to the lime application. 2012 represents the conclusion of this study.

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Individual Year Results:

Results: 1995 Corn

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 15.5% Moisture, %	74	73	0.59 ns
	16.4	16.5	0.42 ns
Test Wt, lbs/bu	57.8	57.6	0.07 *
Cost/ac	---	$6.29	

Results: 1996 Soybeans

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13%	42	43	0.32 ns
Moisture, %	9.0	8.9	0.03 **
Test Wt, lbs/bu	56.1	56.1	0.88 ns
Cost/ac	---	$6.29	

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Results: 1997 Corn

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 15.5%	121	125	0.10 *
Moisture, %	19.5	19.5	0.56 ns
Test Wt, lbs/bu	56.4	56.3	0.88 ns
Cost/ac	---	$6.29	

Results: 1998 Soybeans

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13%	50	58	0.0002 ***
Moisture, %	12.8	12.9	0.48 ns
Test Wt, lbs/bu	55.2	54.4	0.002 ***
Cost/ac	---	$6.29	

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Results: 1999 Corn

Variable	No Lime	Lime	Prob >/T/
Soil pH	5.6	6.3	---
Yield, bu/ac at 15.5% Moisture, %	145	149	0.177 ns
Test Wt, lbs/bu	12.9	12.5	0.002 ***
Cost/ac	58.4	58.1	0.045 **
	---	$6.29	

Results: 2000 Soybeans

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13% Moisture, %	37	43	0.0001 ***
Test Wt, lbs/bu	8.7	8.9	0.0046 ***
Cost/ac	57.4	57.7	0.099 *
	---	$6.29	

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Results: 2001 Corn

Variable	No Lime	Lime	Prob >/T/
Soil pH	5.3	6.0	
Yield, bu/ac at 15.5% Moisture, %	130	132	0.657 ns
Test Wt, lbs/bu	15.1	14.9	0.020 **
Cost/ac	58.0	57.8	0.128 ns
	---	$6.29	

Results: 2002 Soybeans

Variable	No Lime	Lime	Prob >/T/
Soil pH	5.2	6.1	
Yield, bu/ac at 13% Moisture, %	43	50	0.0003 ***
Test Wt, lbs/bu	9.9	9.9	0.477 ns
Cost/ac	55.6	55.8	0.284 ns
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Results: 2003 Corn

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 15.5%	88	99	0.016 **
Moisture, %	12.5	12.7	0.171 ns
Test Wt, lbs/bu	60.1	61.0	0.017 **
Cost/ac	---	---	

Results: 2004 Soybeans (DK 25-51)

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13%	40	44	0.0067 ***
Moisture, %	11.2	11.2	0.501 ns
Test Wt, lbs/bu	56.2	56.1	0.803 ns
Cost/ac	---	---	

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Results: 2005 Corn (Pioneer 33P97)

Variable	No Lime	Lime	Prob >/T/
Soil pH	5.5	6.5	
Yield, bu/ac at 15.5%Moisture, %	145	147	0.306 ns
Test Wt, lbs/bu	15.4	15.2	0.108 ns
	59.8	59.6	0.284 ns

Results: 2006 Soybeans (Asgrow 3005)

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13%	53	57	0.0186 **
Moisture, %	14.9	14.9	0.7040 ns
Test Wt, lbs/bu	56.2	56.0	0.1084 ns
Plants, 1000/ac	133.8	125.8	0.1876 ns

Planted: 5/12/06 Harvested: 10/24/06

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Nebraska On-Farm Research Network

Results: 2007 Corn (LG 2540BT)

Variable	No Lime	Lime	Prob >/T/
Soil pH	5.5	6.2	
Yield, bu/ac at 15.5%	121	119	0.256 ns
Moisture, %	15.7	15.4	0.003 ***
Test Wt, lbs/bu	58.7	58.7	0.859 ns
Plants, 1000/ac	20.4	19.8	0.756 ns
Planted: 5/2/07	Harvested: 10/22/07		

Results: 2008 Soybeans

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13%	40	45	0.0009 ***
Moisture, %	10.5	10.6	0.208 ns
Test Wt, lbs/bu	57.6	57.4	0.345 ns
Plants, 1000/ac	182.2	155.2	0.385 ns
Planted: 5/26/08	Harvested: 10/10/08		

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Results: 2009 Corn (Midwest 79504)

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 15.5%Moisture, %	212	204	0.234 ns
Test Wt, lbs/bu	17.6	16.5	0.005 ***
Plants, 1000/ac	58.6	59.3	0.041 **
Planted:	24.6	24.0	0.500 ns

Harvested: 11/11/09

Results: 2010 Soybeans (Asgrow 2909)

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13%	49	62	0.0292 **
Moisture, %	8.5	8.6	0.374 ns

Planted: 5/31/10 Harvested: 10/7/10

Nebraska Soybean & Feed Grains Profitability Project

Nebraska On-Farm Research Network

Results: 2011

Corn (Channel 210-61VT3)

Variable	No Lime	Lime	Prob >/T/
Yield, bu/ac at 15.5%Moisture, %	192	185	0.1223 ns
Test Wt, lbs/bu	15.0	14.6	0.0161**
Planted: 4/30/2011	60.5	60.3	---

Harvested: 10/20/11

Results: 2012

Soybeans

Treatment	No Lime	Lime	Prob >/T/
Yield, bu/ac at 13% Moisture, %	29.9	34.3	0.0234**
Test Wt, lbs/bu	7.6	7.5	0.1419 ns
Variety Dekalb 2431	53.6	54.9	0.1813 ns
Planted: 5/16/12			

Harvested: 9/28/12

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Information: 2011 - Soil Test

	SOM	pH	M3-P	K	S	Zn
			0-8"			
No Lime	3.1	5.3	10.8	206	11.2	0.62
Lime	3.3	5.9	12.2	191	11.2	0.69
			8-16"			
No Lime	3.0	6.1	5.5	171	8.0	0.15
Lime	2.4	6.4	8.0	155	7.3	0.12