

# 2012 SMFD

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## The Quest for the Holy Grail of Soybean Production

- **Crop nutrition section**
  - Soil supply
  - Pre-season applications
  - Micronutrients
  - Foliar feeding

2012SMFD-Shapiro (1)



2012SMFD-Shapiro (2)

Table 1. Plant part to be sampled, sampling time and sufficiency levels for plant tissue analysis.

Crop	Corn	Soybeans
Plant part	Ear leaf	Uppermost full leaves
Time:	Silking	Prior to or early flowering
Element	-----Sufficiency range <sup>1</sup> percent-----	
Nitrogen	2.75-3.50	4.25-5.50
Phosphorus	0.25-0.50	0.25-0.50
Potassium	1.70-2.50	1.70-2.50
Calcium	0.20-1.00	0.35-2.00
Magnesium	0.20-0.60	0.25-1.00
Sulfur	0.20-0.50	0.20-0.40
	-----Sufficiency range <sup>1</sup> ppm-----	
Manganese	20-150	21-150
Iron	20-250	50-350
Boron	4-25	20-50
Copper	6-20	10-30
Zinc	20-70	20-50
Aluminum	10-300	10-200

<sup>1</sup>Sufficiency range is valid for the crop, plant part, and sampling time indicated.

<sup>2</sup>Aluminum is not essential. This is the normal range in plants.  
 (Courtesy of Penn State)

2012SMFD-Shapiro (3)

Table 2. Mean soybean grain yield as affected by starter N and foliar nutrient application treatments at four locations in 2011.

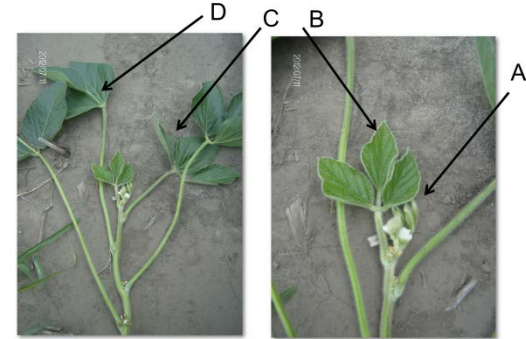
Treatment	Grain yield.
Control	64.8
Row cleaning	65.0
5 lb N in-furrow	65.9
10 lb N in-furrow	66.3
10 lb N inject 2" to side	65.9
10 lb N over the row	64.1
Foliar V4	64.8
Foliar R2	67.2
Foliar V4 and R2	65.9
Starter plus Foliar V4	67.1

2012SMFD-Shapiro (4)

## Spring 2012 Soil Test Information:

Soil attribute	Platte Center	David City	Lexington	O'Neill
pH	6.7	6.6	6.3	5.3
Organic Matter (%)	3.6	2.8	3.8	2.7
Soluble salts	0.48	0.39	0.51	0.18
Nitrates (ppm)	21.4	15.1	23.1	16.1
Melich 3 P	143	16	56	25
K	744	386	623	180
Ca	24	20	40	18
Zn	4.2	3.1	5.0	2.6
Fe	86	52	40	100
Mn	17	13	13	25
Cu	1.5	0.86	0.85	0.79

2012SMFD-Shapiro (5)



**Where to sample soybeans  
for foliar analysis?**

2012SMFD-Shapiro (6)

## Fertility treatments applied at each demonstration site (2012)

Treatments	N R4	NRAGE	SoyGrow	Starter	Poultry Manure 5 gal band 10-34-0 @ 3 ton/AC	Am SO4 @ 100 lbs/ac	MAP @ 150 lbs/ac	KCL @ 100 lbs/acre	Pel lime	Soy Green
1	X	X	X	X						
2	X	X	X	X						
3		X	X	X						
4	X		X	X						
5	X	X		X						
6	X			X						
7										
8						X				
9										
10						X				
11								X		
12	X	X	X	X	X	X	X	X	X	
13 (O'Neill)									X	
14 (Lex)										X

2012SMFD-Shapiro (7)

## Foliar analysis at flowering for two SMFD Sites 2012 (July 11)

	Average of % N	Average of % P	Average of % K	Average of % S	Average of % Ca	Average of % Mg	Average of ppm Zn	Average of ppm Mn	Average of ppm Fe	Average of ppm Cu
David City	5.5	0.57	2.41	0.31	0.93	0.42	47	58	130	11
Platte Center	5.9	0.68	2.40	0.34	1.03	0.43	50	74	157	10
Average	5.7	0.62	2.40	0.32	0.98	0.42	49	66	143	10
No starter, R2 treatments	5.7	0.60	2.36	0.33	1.02	0.43	51	65	160	11
NRage and starter	5.7	0.59	2.40	0.32	1.00	0.42	48	64	144	10
Starter alone	5.6	0.65	2.43	0.31	0.95	0.42	48	63	137	10
Nothing	5.7	0.67	2.38	0.32	0.99	0.43	48	63	144	10
Kitchen sink	5.5	0.60	2.43	0.33	0.92	0.41	49	76	133	10
Average	5.7	0.62	2.40	0.32	0.98	0.42	49	66	143	10
Critical Values	5.0	0.40	2.00	0.30	0.35-2.0	0.25-1.0	20-50	21-150	50-350	10-30

2012SMFD-Shapiro (8)