Effect of Bio-Control Agents on the Yield of Organic Soybean

Cooperator: Lynn Brakke
Nearest Town: Comstock
Soil Type: Silty clay
Tillage: Fall chiseled, spring cultivated
Previous Crop: Wheat
Variety: S 0 8 - 8 0
Planting Date: 5-25-05
Row Width: 22 inches
Fertilizer: 900 lbs/a of "Cluck" 4-4-2 was applied fall 2003
Weed Control: Row cultivation 3 times
Application date and conditions:

Date	7-7-05	7-26-05	8-5-05
Wind (mph)	7 S	6 N	calm
Temperature	79F	69F	74F

Plot size: 4 rows x 25 feet. Inside 2 rows x 20 feet harvested
Harvest Date: 9-29-05
Experimental Design: Randomized complete block with 4 replications

Purpose of Study:

Organic farmers will need to do a risk/benefit assessment and determine if it is economical to spray any organic approved materials to reduce disease and aphid damage to the crop. The objective of this study was to evaluate the height, test weight, yield, protein and oil content of soybean after the application of three biofungicides and one bio-aphid control product compared with a control sprayed with water and a control without any treatment.

Results

During the season the soybean plots were visited on a regular basis. No visual differences in the treatments were observed. No soybean leaf rust was reported in NW MN. A low level of soybean aphids was observed in the field as well as natural predators. Conclusion: none of the treatments showed significant differences when compared with the controls (no treatment at all and water applied on July 7).

Products used:

Ballad™ - Biofungicide based on patented strain of *Bacillus pumilus*.

MicroAF™ - This is a biofungicide formulation with eight different micro-organisms in a liquid material.

Sporan™ - A concentrated blend of plant essential oils (Rosemary oil 17.6% by weight and Oil of Wintergreen 82.4% by weight), acting as a contact fungicide.

MicroAC™ or Aphrid™ - This is a blend of beneficial micro-organisms that impact the growth of the soybean aphid.

Data Table: Effects of treatments on yield and quality of organically grown soybean.

Treatment	Application rate	Application[1] date	9-21 Crop height	Yield[2]	Test weight	Protein	Oil
			(inches)	(bu/a)	(lb/bu)	(%)	(%)
MicroAC	0.1lb/a	2	29.3	54.9	57.9	34.6	18.4
Ballad	8 pt/a	2	27.9	53.9	57.8	34.5	18.4
Control		None	28.9	53.3	57.7	34.8	18.3
MicroAC	0.1lb/a	1	28.5	52.5	57.6	34.9	18.3
Sporan	3 pt/a	1	28.4	52.0	57.6	34.8	18.4
MicroAF + MicroAC	12.8oz/A + 0.1lb/a	1	27.8	51.8	57.8	34.6	18.4
Water control		1	28.3	51.7	57.4	34.7	18.4
MicroAF	12.8oz/a	1	28.4	51.6	57.8	34.7	18.4
MicroAF	12.8oz/a	2	27.9	51.0	57.4	34.8	18.4
Sporan	3 pt/a	2	27.4	50.2	57.7	34.8	18.3
MicroAF + MicroAC	12.8oz/A + 0.1lb/a	3	26.4	50.1	57.9	34.7	18.4
Ballad	8 pt/a	1	29.5	47.6	57.5	34.6	18.4
Average			28.2	51.7	57.7	34.7	18.4
C.V.			6.2	5.6	0.55	0.6	0.6
LSD 0.05			NS	NS	NS	NS	NS

[1]All products were applied with 10 gallons of water per acre. 1 = July 7; 2 = July 26; 3 = Aug 5.
[2] Corrected to 13 % moisture.

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For additional information:
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