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A Sugar Beet Root Rot Analysis of the Irrigation Rotation Plots, U.S. Belle Fourche Field Station, Newell, South Dakota

South Dakota Agricultural Experiment Station

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Progress Report, Project 126
Agricultural Experiment Station
South Dakota State College
Brookings, South Dakota

Sugar beet seedlings infected by *Pythium ultimum*, *Rhizoctonia* sp., *Aphanomyces cochlioides* and *P. butleri* in greenhouse cultures in soil samples from continuous cropped plots at Newell, South Dakota

Plot no.	Crop, treatment	Rotation no.	Seedlings infected by: *Pythium ultimum*	*Rhizoctonia* sp.	*Aphanomyces cochlioides*	*Pythium butleri*
III 32	Corn	6	- -	- -	- -	- -
III 25	Oats	1	- 3	- -	- -	- -
II 47	Barley	9	10 6	5 1	- -	- -
III 28	Wheat	3	12 6	- -	- -	- -
III 9	Wheat	14	- 2	- -	- -	- -
III 27	Fallow	14	6 5	- -	- -	- -
III 31	Potatoes	4	- 7	- 4	- -	- -
III 24	Alfalfa	8	6 -	- -	- -	- -
III 23	Alfalfa, manured	8b	- -	- -	- -	- -
III 30	Beets	2	- 9	- -	10 15	- -
III 26	Beets, phosphate odd years	2a	14 2	- 1	- -	- -
III 29	Beets, manured odd years	2c	7 9	- -	7 12	- -
I 45	Beets, manured every year	2b	18 19	- -	- -	- -

Sugar beet seedlings infected by *Pythium ultimum*, *Rhizoctonia* sp., *Aphanomyces cochlioides* and *P. butleri* in greenhouse cultures in soil samples from two-year rotation plots at Newell, South Dakota

Plot no.	Crop, treatment	Rotation no.	Seedlings infected by: *Pythium ultimum*	*Rhizoctonia* sp.	*Aphanomyces cochlioides*	*Pythium butleri*
I 22	Oats	16	22	-	-	-
I 23	Corn		19	1	-	-
I 26	Beets	20	20	-	3	-
I 27	Potatoes		29	-	-	-
I 40	Beets, phosphate	20a	-	2	-	-
I 41	Potatoes		18	4	-	-
I 28	Beets, manured	21	21	-	-	-
I 29	Potatoes		30	-	-	-
I 30	Beets	22	18	-	-	-
I 31	Oats		39	-	4	-
I 24	Beets, phosphate	22a	25	-	-	-
I 25	Oats		29	-	-	-
I 32	Beets	23	10	-	-	-
I 33	Oats, manured		5	-	-	-
I 34	Oats	24	10	-	-	-
I 35	Potatoes		5	-	-	-
I 42	Oats	24a	7	-	-	-
I 43	Potatoes, phosphate		17	-	-	-
I 36	Oats, manured	25	-	-	-	-
I 37	Potatoes		17	-	-	-
I 38	Corn	26	-	-	-	-
I 39	Potatoes		27	-	-	-
I 44	Barley and sweet clover	19	43	-	29	-
I 46	Beets		4	2	107	-
I 47	Barley and sweet clover, sheeped	29	3	1	58	-
I 48	Beets		2	15	57	-

Sugar beet seedlings infected by Pythium ultimum, Rhizoctonia sp. Aphanomyces cochlioides and P. butleri in greenhouse cultures in soil samples from three-year rotation plots at Newell, South Dakota

Plot no.	Crop, treatment	Rotation no.	Seedlings infected by: Pythium ultimum	Rhizoctonia sp.	Aphanomyces cochlioides	Pythium butleri
I 16	Beets		-	-	-	-
I 17	Potatoes	30	-	1	-	-
I 18	Oats		-	-	-	-
I 19	Beets		-	-	-	-
I 20	Potatoes	31	-	-	-	-
I 21	Oats, manured		4	-	-	-
III 10	Beets		12	-	-	-
III 11	Corn	32	5	-	-	-
III 12	Oats		-	-	-	-
II 41	Beets		1	2	-	-
II 42	Oats	34	-	-	-	-
II 43	Potatoes		12	-	-	-
II 44	Beets		-	-	-	-
II 45	Oats, manured	35	7	-	-	-
II 46	Potatoes		8	-	-	-
II 37,38	Sweet clover pasture, corn		- -	53 7	- -	- -
II 39,40	Corn	37	20 6	- -	- -	- -
II 49,50	Barley and sweet clover		9 2	- -	- -	- -

Sugar beet seedlings infected by Pythium ultimum, Rhizoctonia sp., Aphanomyces cochlioides and P. butleri in greenhouse cultures in soil samples from four-year rotation plots at Newell, South Dakota

Plot no.	Crop, Treatment	Rotation no.	Seedlings infected by: Pythium ultimum	Rhizoctonia sp.	Aphanomyces cochlioides	Pythium butleri
I 1	Beets		4	4	-	-
I 2	Alfalfa, spring seeded	40	1	3	-	-
I 3	Alfalfa		25	-	-	-
I 4	Potatoes		8	2	-	-
II 48	Beets, phosphate		5	1	-	-
II 51	Alfalfa, spring seeded	40a	11	1	-	-
II 52	Alfalfa		30	2	-	-
III 49	Potatoes		11	-	-	-
I 5	Beets			12	-	-
I 6	Alfalfa, spring seeded	42	11	1	-	-
I 7	Alfalfa		11	1	-	-
I 8	Oats		10	1	-	-
III 19	Oats and alfalfa		-	-	-	-
III 20	Alfalfa	44	8	-	-	-
III 21	Alfalfa		18	-	-	-
III 22	Potatoes		-	-	-	-
II 3	Oats and alfalfa		-	2	-	-
II 4	Alfalfa	46	1	-	7	-
II 5	Alfalfa		1	-	56	-
II 6	Beets		32	2	107	-
II 19	Oats and alfalfa		6	-	-	-
II 20	Alfalfa	48	-	-	-	-
II 21	Alfalfa		17	-	-	-
II 22	Wheat		-	-	-	-
III 39	Beets		3 12	0 1	135 50	- -
III 40	Barley & sweet clover		- 6	2 -	96 14	- -
III 41	Sweet clover pasture, cows	47	18 20	1 2	- -	- -
III 42	Corn, sheeped		16 14	- 4	- -	- -
I 49	Sweet clover, sheeped		2 2	55 -	1 -	- -
I 50	Beets	49	- 1	3 2	74 19	- -
I 51	Beets, manured		4 27	- 3	16 1	- -
I 52	Barley & sweet clover		5 5	2 2	- -	- 1

Sugar beet seedlings infected by *Pythium ultimum*, *Rhizoctonia* sp. *Aphanomyces cochlioides* and *P. butleri* in greenhouse cultures in soil samples from six-year rotation plots at Newell, South Dakota

Plot no.	Crop, treatment	Rotation no.	Seedlings infected by: *Pythium ultimum*	*Rhizoctonia* sp.	*Aphanomyces cochlioides*	*Pythium butleri*
I 9	Alfalfa		16	-	-	-
I 10	Potatoes		-	1	-	-
I 11	Oats		1	1	-	-
I 12	Beets	60	6	-	-	-
I 13	Alfalfa, spring seeded		-	8	-	-
I 14	Alfalfa		-	-	-	-
I 23	Alfalfa		29	-	-	-
I 24	Potatoes		15	1	-	-
I 25	Oats		-	4	-	-
I 26	Beets, phosphate	60a	21	-	-	-
I 27	Alfalfa, spring seeded		18	-	-	-
I 28	Alfalfa		19	1	-	-
II 13	Alfalfa		17	-	-	-
II 14	Potatoes		2	6	-	-
II 15	Oats, manure	61	1	-	-	-
II 16	Beets		4	-	-	-
II 17	Alfalfa, spring seeded		-	15	-	-
II 18	Alfalfa		8	1	-	-
II 7	Alfalfa		5	-	-	-
II 8	Corn		16	-	-	-
II 9	Oats		13	-	-	-
II 10	Beets	62	8	-	-	2
II 11	Alfalfa, spring seeded		4	-	-	-
II 12	Alfalfa		2	2	-	-
III 13	Alfalfa, hogged		33	2	-	-
III 14	Corn, hogged		6	1	-	1
III 15	Oats	63	8	3	-	-
III 16	Beets		24	-	-	10
III 17	Alfalfa, spring seeded		15	4	-	7
III 18	Alfalfa		23	-	-	8
III 43	Alfalfa		12	1	44	-
III 44	Potatoes		3	5	-	-
III 45	Beets	64	13	2	-	-
III 46	Oats and alfalfa		12	-	-	-
III 47	Alfalfa		6	-	-	-
III 48	Alfalfa		36	-	-	-
II 35	Alfalfa, sheeped		4 7	2 -	- -	- -
II 36	Corn, sheeped		- -	5 1	- -	- -
III 33	Beets	71	2 -	1 1	63 4	- -
III 34	Oats and alfalfa		6 10	- -	- 2	- 2
III 35	Alfalfa		- 8	- -	5 4	- -
III 36	Alfalfa		7 6	- -	102 38	- -