

2016 Research Report to Maine Potato Board

Effect of Crop Rotation on Potato Pink Rot (*Phytophthora erythroseptica*)

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A field trial was conducted in Aroostook Research Farm, Presque Isle, ME in 2014 and 2015 to evaluate the effect of crop rotation. There were two fields (A and B) in the trial. In field A, different crops were grown in 2014, including alfalfa (*Medicago sativa*), barley (*Hordeum vulgare*)/ryegrass (*Lolium multiflorum*), canola (*Brassica napus*), red clover (*Trifolium pratense*), onion (*Allium cepa*), sweet corn (*Zea mays*) and oat (*Avena sativa*), followed by potato in 2015. In field B, potato was planted in 2014 and the above rotation crops were grown in 2015. Randomized complete block design was applied with four replications. Plots size was six 3-ft-wide rows with 20 feet in length, and one foot of plant spacing. The middle two rows of each plot were inoculated with *Phytophthora erythroseptica* inoculum. Potato (cv. ‘Russet Norkotah’) seed pieces were planted on 26 May 2014 and 29 May 2015. Fertilizer (14:14:14) was applied at 1,100 lb/A, followed by placing the treated seed pieces by hand. All plots were treated with Bravo ZN (1.5 pt/A) during the season to control late blight. The plots were maintained using standard production practices. The emergence was evaluated in June and July. Emergence was a count of the emerged plants per row of the 20 seed pieces planted and converted to percentage. Potato vines were killed by applying Reglone (1.5 lb/A) on 15 and 20 September. Potato tubers in the middle two rows of each treatment were dug out by a harvester and picked by hand on 24 September. The harvested tubers were mechanically washed and sized. The severity of pink rot was rated on 1st October. The rating scales for disease were based on the percentage of rotted area on cut tubers: 0 (no symptom), 1 (1 to 5%), 2 (6 to 25%), 3 (26 to 50%), 4 (51 to 75%), and 5 (>75%). Yield and total yield were measured. Data were analyzed using JMP.

There was no treatment effect on pink rot severity due to a large variation of the measurement, although the disease severity was different. There was a significant difference of yield by using different rotation crops. Alfalfa, pumpkin, and canola cropping significantly increased potato yield.

Treatment	Total yield (lb/plot)	Pink rot incidence (%)	Pink rot severity (%)
Canola	17.88 a ^z	6.31	5.66
Pumpkin	17.33 a	9.42	7.72
Alfalfa	17.03 a	10.90	9.64
Oats	15.98 ab	5.67	5.23
Barley & Ryegrass	15.91 ab	7.32	6.18
Corn	15.08 ab	7.35	7.25
Clover	13.95 ab	4.23	4.23
Potato	10.77 b	10.36	10.35

Mean values not connected by the same letter are significantly different ($P < 0.05$).