CROPS AND LIVESTOCK RESEARCH CENTRE

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EFFECT OF DOLOMITIC LIMESTONE, CALCITIC LIMESTONE AND GYPSUM APPLIED IN THE SPROUT YEAR ON NUTRIENT STATUS OF WILD BLUEBERRY

The wild lowbush blueberry (*V. angustifolium Ait.)* is a stress tolerant plant well adapted to acidic, nutrient poor environments. These plants grow in the wild on orthic humo-ferric podzols with pH levels of 4 - 5 , which are different from the soils associated with traditional farming. Nutrient uptake by the wild blueberry can be both limiting and difficult to attain. Factors contributing to increased soil acidity are; insufficient natural lime in the soil, the use of fertilizers, leaching of nutrients due to rainfall, and crop removal. With the increased use of fertilizers and better yields, soil acidity is at risk in wild blueberry fields. This study was conducted to determine the effect of pH amendments on nutrient status of wild blueberry.

Two sites were evaluated over one cropping cycle. Experimental sites were representative of commercial producing fields in P.E.I. Treatments were an untreated control, dolomitic limestone at 4000 kg ha^{-1}, calcitic limestone at 2667 kg ha^{-1} and gypsum at 3636 kg ha^{-1}. The three products were applied at rates which supplied an equivalent of 800 kg Ca ha^{-1} The treatments were broadcast by hand on the soil surface in early June of the sprout year. The experimental design was a randomized complete block with four replications of each treatment. Soil and tissue samples were taken from all plots at tip dieback in the sprout year and at full bloom in the following crop year. Commercial growers assess the leaf nutrient status based on tissue sampling in the sprout year only.

Wild blueberry yield, stem length, buds per stem and blossoms per stem were not affected by treatment (data not shown).

Soil pH, Ca, and Mg were significantly increased by treatment in both the sprout year and the crop year (Table 1). Calcitic limestone significantly increased soil pH and soil Ca in both years compared to the control. Dolomitic limestone increased soil Mg in both years. Soil S was significantly increased by gypsum in the sprout year only.

Leaf nutrient content of K, S, and Mn were significantly increased by gypsum in the sprout year compared to the control (Table 2). Leaf content of Mn and Fe were significantly increased by calcitic in the crop year compared to the control.

The results indicate that soil pH and mineral content of the blueberry soil can be altered by applications of dolomitic limestone, calcitic limestone and gypsum. Improved leaf nutrient uptake at tip dieback in the sprout year was obtained by gypsum application.

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Table 1: Effect of calcium products on pH and mineral content of test site soil in Prince Edward Island (mean of two sites).

Treatment	Rate [z]	pH	Ca	Mg	S
	kg ha^{-1}		ppm		
			Sprout Year		
Control		4.29	287	69	52
Dolomitic	4000	4.57	349	125	40
Calcitic	2667	4.81	630	68	39
Gypsum	3636	4.11	464	54	160
LSD (P=0.05)		0.30	93	28	55
			Crop Year		
Control		4.30	275	52	26
Dolomitic	4000	4.58	390	123	21
Calcitic	2667	4.93	766	60	24
Gypsum	3636	4.13	389	35	30
LSD (P=0.05)		0.40	250	26	NS

[z] Each product supplied 800 kg Ca ha^{-1} ; NS indicates means are not significantly different.

Table 2: Effect of calcium products on leaf nutrient content of wild blueberry in Prince Edward Island (mean of two sites).

Treatment	Rate [z]	P	K	Ca	Mg	S	B	Cu	Zn	Mn	Fe
	kg ha^{-1}	%					ppm				
						Sprout Year					
Control		.127	.46	.45	.14	.19	26	2.7	8	191	18
Dolomitic	4000	.123	.46	.47	.15	.19	24	3.0	8	195	18
Calcitic	2667	.122	.46	.46	.14	.19	25	2.7	7	195	18
Gypsum	3636	.133	.59	.47	.13	.51	27	2.5	6	305	14
LSD (P=0.05)		NS	.05	NS	NS	.09	NS	NS	NS	47	NS
						Crop Year					
Control		.173	.61	.37	.13	.15	18	3.6	9	224	23
Dolomitic	4000	.167	.57	.37	.14	.13	17	3.5	10	255	25
Calcitic	2667	.166	.59	.38	.15	.14	17	4.0	10	276	30
Gypsum	3636	.169	.60	.35	.10	.18	19	2.7	7	213	20
LSD (P=0.05)		NS	NS	NS	.02	NS	NS	0.8	2	33	6

[z] Each product supplied of 800 kg Ca ha^{-1} ; NS indicates means are not significantly different.