March 2002	SOIL PHOSPHORUS AND WILD BLUEBERRY SOILS - CAUTION!	Number: 02-2 Agdex: 235.23

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 is different from the soil associated with traditional farming. Atlantic soils tend to retain a large portion of applied P, raising concerns over its use. This study was conducted to determine the effect of applied P on soil and nutrient status of wild blueberries.

Three sites were evaluated over three cropping cycles. Experimental sites were representative of commercial producing fields with two in Prince Edward Island and one in Nova Scotia. P was applied at 0, 10, 20, 30, and 40 kg ha^{-1} to replicated plots. N and K were applied at 18 and 10 kg ha^{-1} to all plots. Treatments were applied in the spring of the sprout year in each of three consecutive two-year cropping cycles. The experimental design was a randomized complete block with four replications of each site. Soil and tissue samples were taken from all plots at tip dieback in the sprout year. Shoots were collected in the spring of the crop year to determine effect of plant growth parameters. All plots were harvested in late August.

Results indicate that extractable soil P was increased at each site by applied P and that soil P was further elevated with each additional application over cropping cycles (Table 1). Similarly, leaf P concentration was increased by applied P (Table 2). However, higher applications of soil P did not result in significantly higher leaf P concentration compared to lower rates. Wild blueberry yield, stem length, buds per stem and blossoms per stem were not affected by treatment (data not shown).

The results indicate that repeated applications of soil P to wild blueberry stands will substantially increase levels of soil P with no benefit to plant growth and reproduction. Excessive applications may be wasteful and even detrimental to wild blueberry soils.

K.R. Sanderson and L.E. Eaton[1]

[1]Nova Scotia Agricultural College, Truro, NS

440 Univ. Ave, Charlottetown, PEI C1A 4N6
Tel.: (902) 566-6800 Fax.: (902) 566-6821
Website: http://www.agr.gc.ca/science/charlottetown

Table 1: Effect of applied P in the sprout year over three cropping cycles on extractable soil P (ppm) concentration of wild blueberry at 3 sites.

Treatment	Mt. Stewart, PEI			Tignish, PEI			Debert, NS		
	---------- ppm ----------								
	1992 [Z]	1994	1996	1992	1994	1996	1992	1994	1996
P @ 0 kg ha^{-1}	44	20	53	38	51	51	10	10	9
P @ 10 kg ha^{-1}	41	27	57	31	39	51	10	19	19
P @ 20 kg ha^{-1}	41	40	69	38	48	55	12	23	24
P @ 30 kg ha^{-1}	39	59	93	47	56	76	14	35	38
P @ 40 kg ha^{-1}	50	63	117	47	53	74	15	44	46
Significant effects	NS	L[Y]	L	L	NS	L	L	L	L

[Z] 1992,1994,1996 = sprout year of 1st, 2nd and 3rd cropping cycle, respectively; 1993,1995,1997 = crop year year of 1st, 2nd and 3rd cropping cycle, respectively.

[Y] L indicates significant linear effects ($P = 0.05$). NS, not significant.

Table 2: Effect of applied P in the sprout year over three cropping cycles on leaf P (%) concentration of wild blueberry at 3 sites.

Treatment	Mt. Stewart, PEI			Tignish, PEI			Debert, NS		
	---------- % ----------								
	1992 [Z]	1994	1996	1992	1994	1996	1992	1994	1996
P @ 0 kg ha^{-1}	0.111	0.101	0.105	0.122	0.094	0.105	0.148	0.113	0.115
P @ 10 kg ha^{-1}	0.112	0.103	0.114	0.123	0.095	0.108	0.152	0.118	0.130
P @ 20 kg ha^{-1}	0.125	0.115	0.124	0.128	0.099	0.112	0.160	0.117	0.128
P @ 30 kg ha^{-1}	0.123	0.121	0.137	0.128	0.101	0.119	0.172	0.120	0.138
P @ 40 kg ha^{-1}	0.128	0.125	0.131	0.131	0.101	0.117	0.165	0.120	0.143
Significant effects	L [Y]	L	L	L	NS	L	L	NS	L

[Z] 1992,1994,1996 = sprout year of 1st, 2nd and 3rd cropping cycle, respectively; 1993,1995,1997 = crop year year of 1st, 2nd and 3rd cropping cycle, respectively.

[Y] L indicates significant linear effects ($P = 0.05$). NS, not significant.