PEI Soil & Crop Improvement Association

January 2010
P.O. Box 21012, Charlottetown, PE, C1A 9H6
Tel/fax: (902) 887-2535

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

Evaluation of native shrubs for fruit production under an organic system

Collaborators: Environmental Coalition of PEI, Sir Andrew Macphail Foundation, Gary Schneider

Location: Macphail Woods, Orwell

Treatments: Three native fruiting shrubs- common elder, chokecherry and service berry.

Introduction:

Initiated the fall of 2004, this project evaluated native fruit bearing shrubs – common elder, chokecherry and serviceberry - in combination with white clover under an organic system. Shrubs were monitored for survival, growth rate, length of time to productivity and the quantity and quality of fruit produced. The three treatments were replicated four times. Two replicates were planted in October 2004 and two in May 2005. White clover was planted the fall of 2004 on the first two replicates but was winter killed. White clover was again planted in the spring of 2005 and 2006 but did not survive as a result of competition from weeds.

Common Elder

Chokecherry

Serviceberry

Soil Analysis of site:

Organic Matter (%)	pH	Phosphate (ppm)	Potash (ppm)
3.3	5.8	50	26

Cultural Requirements

▪Common elder likes moist soil and can stand flooding conditions. It is often found in damp areas along roadsides, fence lines and stream banks. Elderberry prefers full sunlight but is very tolerant of shade.
▪Choke cherry prefers rich, moist well-drained soil and will not tolerate flooding. It will grow under light shading but best fruit production occurs in full sun.
▪Serviceberry can be found growing in most conditions, except where extremely wet or the deepest shade. It grows best in full sun and on moist, well-drained soil but can be found along roadsides, invading abandoned fields, in existing windbreaks and in woodlands.

Results and Discussion

Survival rate varied among the three native shrubs. Chokecherry and service berry all survived, however, common elder had a mortality rate of about 17% during the 5 years of the experiment. Average growth rate over the 5 years of the experiment is shown in Figure 1. Chokecherry showed the largest rate of growth going from 38 to 115 cm followed closely by common elder that went from 25 to 100 cm. Common elder growth rate was based on the living plants only. Service berry showed the slowest rate of growth going from 40 to 70 cm.

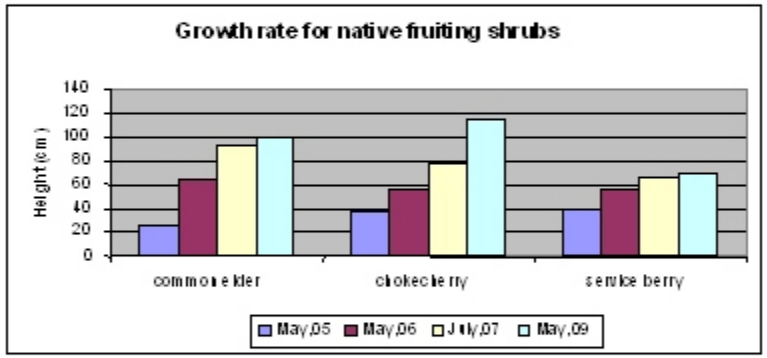

Fig. 1. Average growth rate of surviving shrubs between 2005 and 2009.

Fruit production started in 2006 on common elder and service berry (yields not collected) and sporadically on the chokecherry in 2007. Actual yields varied immensely between individual plants of each variety (24 plants were evaluated for each variety. Individual plant yields were converted to lbs per acre by assuming 600 plants per acre stocking rate). Service berry yields (data not shown) were disappointing over the three year period of 2007 to 2009 with average yield of 144 lbs per acre in 2007, 80 in 2008 and 105 in 2009. In 2007, individual plant yield ranged from 0 to 1127 lbs per acre. This lessened in 2008 to 0 to 390 and in 2009 was 0 to 459. Unfortunately no 1 plant gave consistent results. The highest producer in 2007 (1127 lbs/acre) had no production in 2008 and only the equivalent of 246 lbs/acre in 2009.

Chokecherry yields (Fig. 2) were variable. Only four plants produced fruit in 2007 with yield ranging from 198 to 4728 lbs/acre. In 2008, fifteen plants produced yields ranging from 11 to 31894 lbs per acre. Unfortunately in 2009, yields decreased. Sixteen plants produced but yields ranged from 25 to only 4018 lbs per acre. The 2 plants with high yields in 2008 - 31894 and 27788 lbs/acre- decreased to 2471 and 831 lbs/acre.

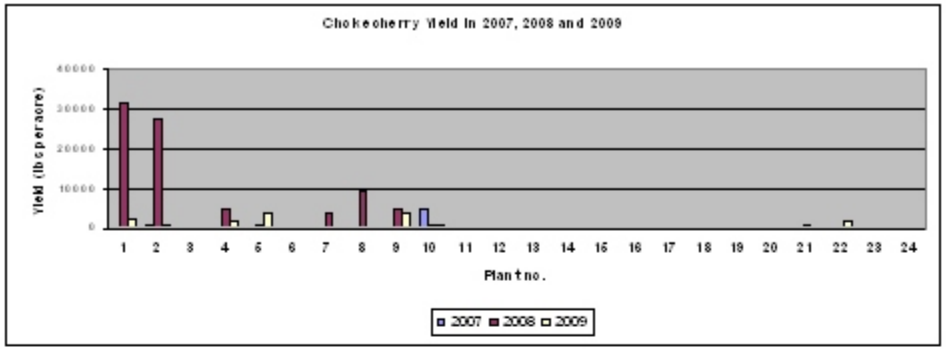

Fig. 2. Individual chokecherry plant yield converted to lbs/acre in 2007, 2008 and 2009.

Common elder yields were variable but some plants show huge potential. Average production over the 3 years ranged from 78 to 33,509 lbs per acre. Yields by year for individual plants are shown in the Fig. 3. It should be noted that three of the plants gave consistently high yields (plant numbers 3, 4 and 6) with average production of 21958, 28810 and 33509 lbs/acre while the remainder mainly ranged from 78 to 8201 lbs/acre (exception is plant no. 1 which had a high yield the first year – 29771 lbs/acre - but substantially lower yields in year 2 - 9203 lbs/acre - and year 3 – 7294 lbs/acre). Production levels were obtained with no use of fertilizer or plant amendments.

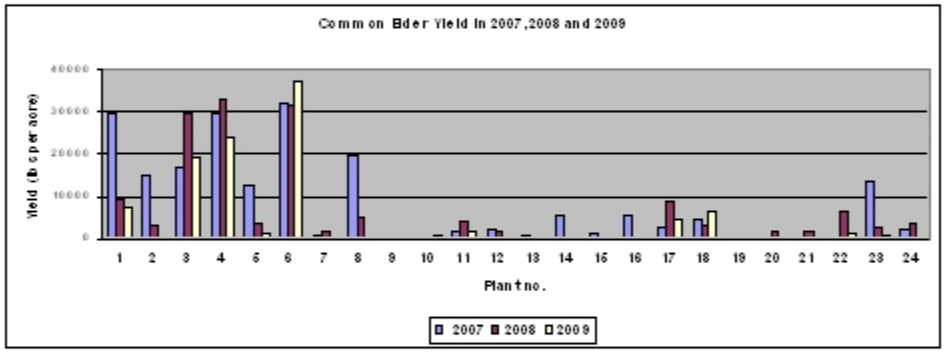

Fig. 3. Individual common elder plant yield converted to lbs/acre in 2007, 2008 and 2009.

Conclusions and Recommendations

- Service berry- variety tested has no potential for commercialization. Although fertilizer and plant amendments were not used in the experiment , yields and plant form (low height) appear to limit this plants potential. There is still a possibility of other native varieties of this species having the potential for commercialization and that should be investigated.
- Chokecherry – may still have the potential for commercialization. The plants in this experiment are still showing steady growth and fruit production may increase as they get older. Plants progress should be monitored beyond five years to determine full potential as well as various fertility/management plans should be investigated.
- Common elder have potential for commercialization. Potential growers should first screen native plants and select the high yielding plants for prorogation (cuttings). In addition, fertilization and management practices should be evaluated to determine methods to enhance production levels.