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Introduction

The Native American Apsaalooke Tribe communicated a desire for a revitalization of their traditional ways (Small 2012,2013). Using the holistic process to foster discourse, the "Let's Pick Berries" Project welled up from within the community. Species selected as most valued by the Apsaalooke community were: *Prunus virginiana* (Chokecherry), *Prunus americana* (American Plum), *Sheperdia argentea* (Silver Buffaloberry), and *Amelanchier alnifolia* (Juneberry). Building on prior collaborative projects focused on traditional berries (Page et al. 2013, Small et al. 2013), the Apsaalooke people in Lodge Grass requested both plant material and supporting information about cultivation and propagation of such plants.



American plum



Silver Buffaloberry



Chokecherry



Juneberry

Hypotheses Tested

Hypothesis 1. Propagation of Genus *Rosaceae* (plum, chokecherry, juneberry) genus is unlikely to be successful using hardwood cuttings under mist, but possible using seed.

H2 Propagation of buffaloberry under mist using hardwood cuttings is likely to be successful.

Null 1 Propagation of *Rosaceae* is likely to succeed using hardwood cuttings under mist.

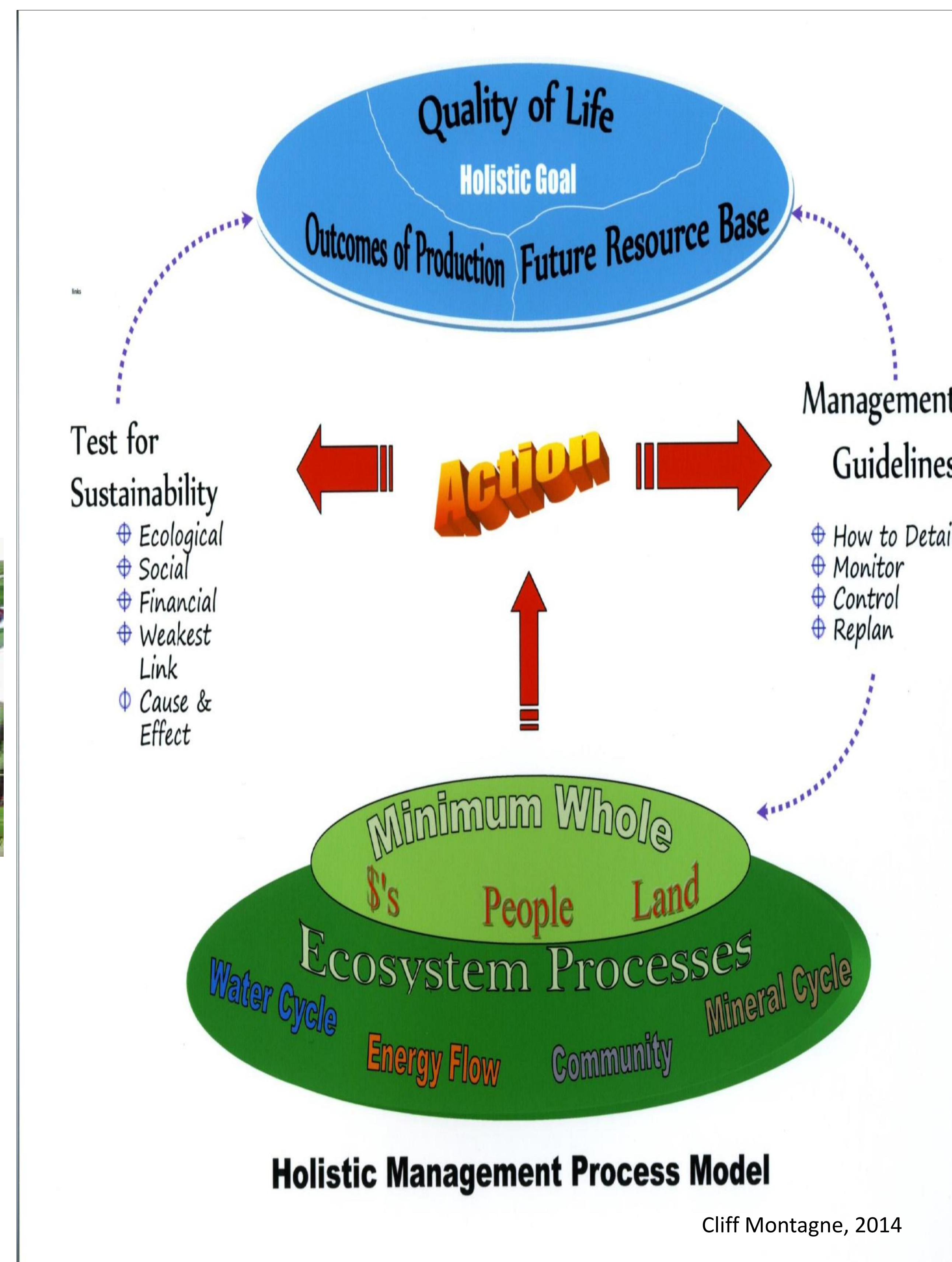
N2 Propagation of buffaloberry under mist using hardwood cuttings is not likely to succeed.

Materials

- Plant stock (*Rosaceae* species) at least 15cm long collected in early June.
- Indole-3-butyric acid (IBA) rooting hormone at least 0.8% (8,000 ppm liquid form; up to 30,000 ppm talc form)
- Misting structure with temperature controller to keep rooting medium
- 20 place 6cm x 30cm growth containers with 50-50 mix perlite /vermiculite rooting media
- Knife tapered on one side only

Methods

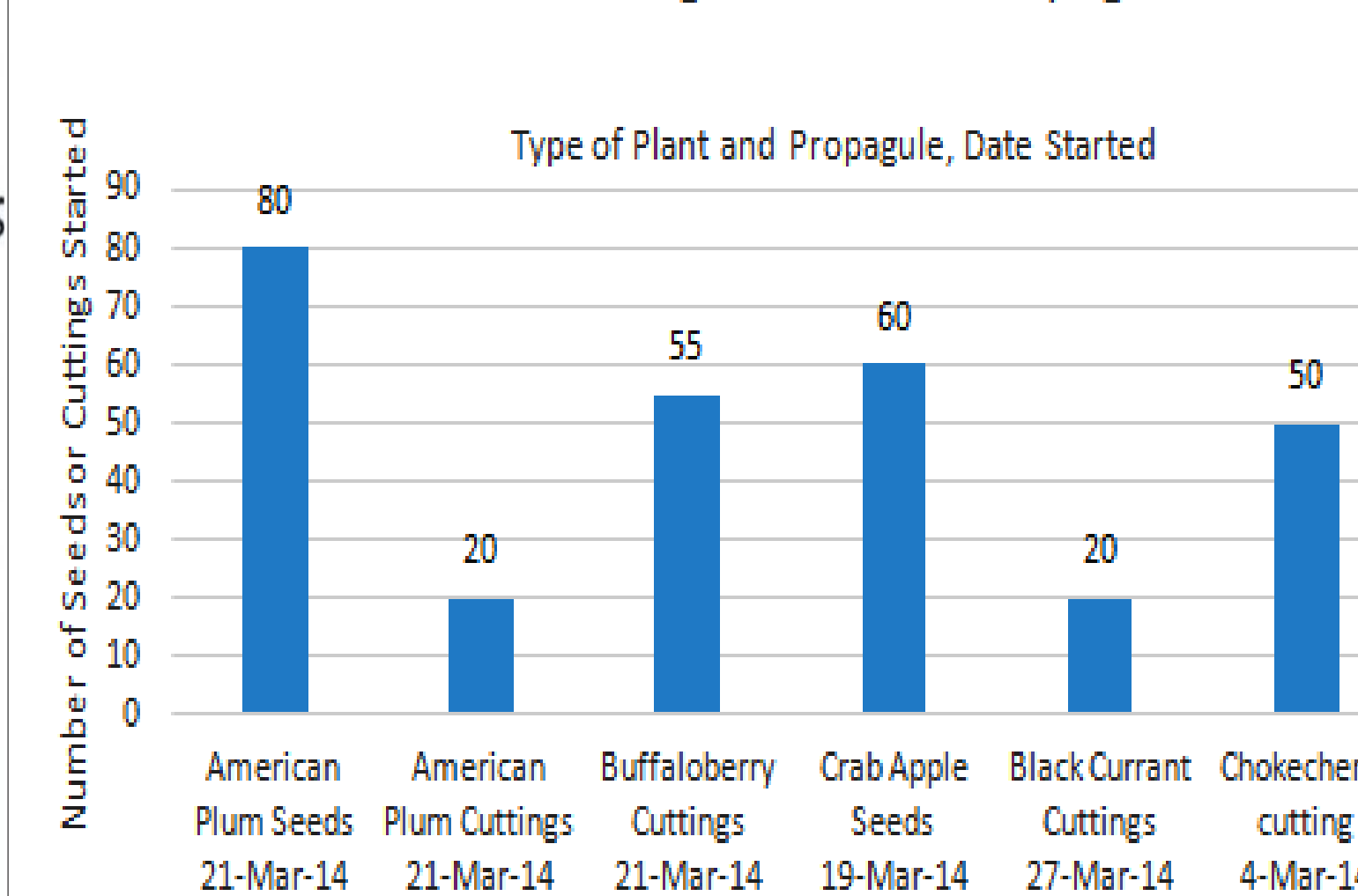
- Peer-refereed literature was searched for propagation methods of selected berry species in winter
- Attempted hardwood cuttings, only propagation technique possible in winter
- Cuttings (~20cm) obtained from on-campus landscaping, stored in 22°C dark room until planting
- Media put in pots, placed under mist with constant 22°C, 90-100% relative humidity.
- Plant stock was cut to 15cm and dipped in 30,000 ppm IBA to induce root formation.



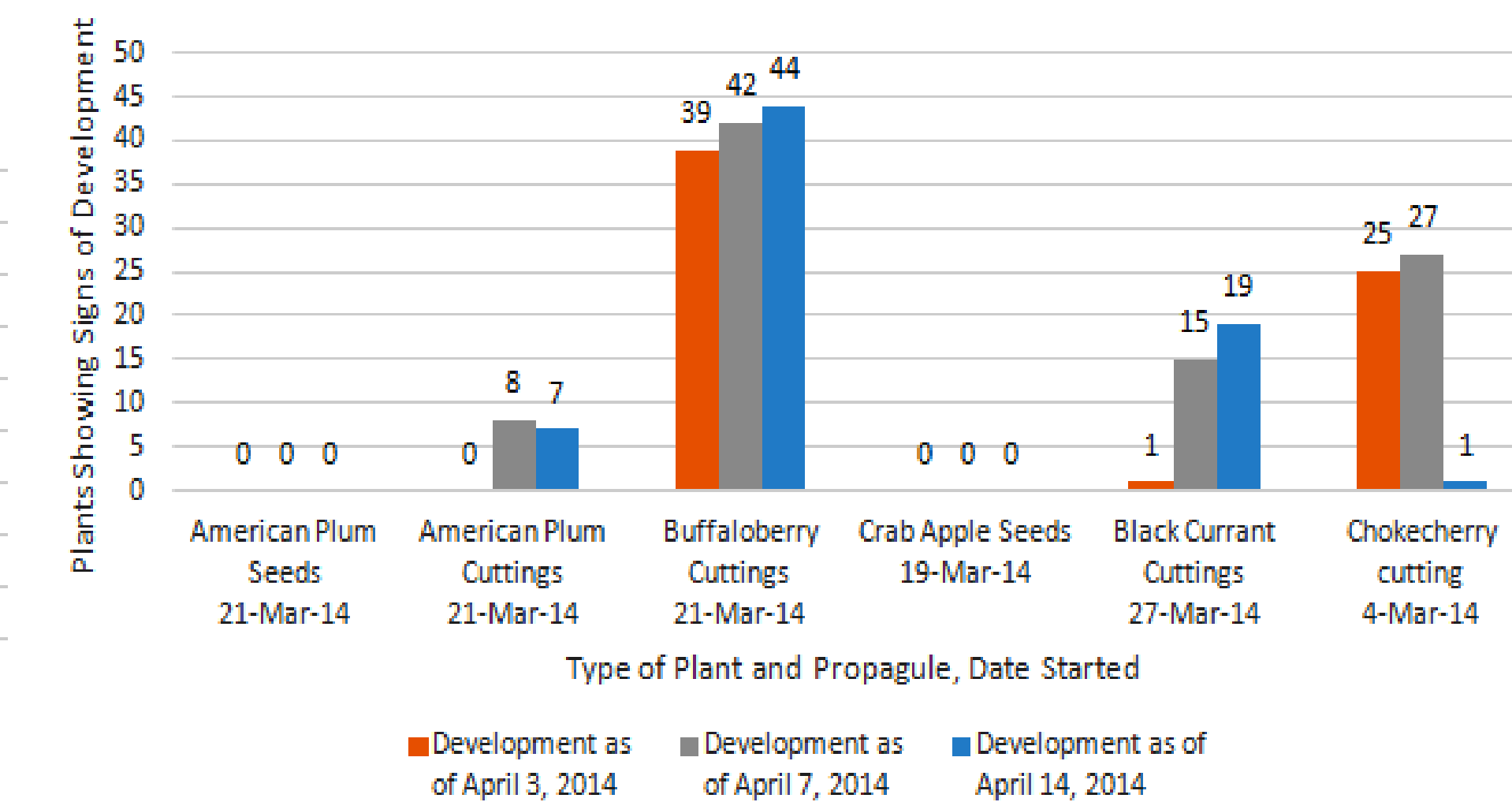
Results

Propagation of *Rosaceae* (chokecherry, juneberry) genus under mist, using hardwood cuttings initially showed signs of vegetative and floral development. However, a majority of propagules failed after further time in the mist chamber and/or subsequent hardening-off exercises. Propagation of American plum by seed was a failure due to unapparent reasons. Buffaloberry propagules had uniform, high rates of floral and vegetative development, and have not been hardened off yet. American plum and some juneberry cuttings have yet to be hardened off.

Number of Cuttings and Seeds Propagated



Number of Plants Showing any Sign of Development



Recommendations

- Propagate *Rosaceae* species by softwood cuttings collected during growing season.
- Collect and process seed following fruit set for uniform seed collection.
- Be careful to collect male and female plants of the dioecious buffaloberry.
- Make careful selection of disease-free plants to propagate.
- Assemble basic hand tools, e.g., spade, posthole digger.
- Test hypothesis: establishing and expanding natural berry patches may serve as economic engine for Apsaalooke in Lodge Grass, MT.

Literature Cited

- Beck, M. J., & Vander Wall, S. B. (2011). Diplochory in western chokecherry: you can't judge a fruit by its mesocarp. *Oecologia*, 165(1), 131-141.
- Benfer, Adam. n.d. American Plum. Accessed April 8, 2014. <http://www.aihd.ku.edu/>.
- Bishop, B. H., & Nelson, S. H. (1980). Propagation and transplanting of Saskatoon (*Amelanchier alnifolia* Nutt1) Softwood Cuttings. *S. Canadian Journal of Plant Science*, 60(3), 883-890.
- Carandale Farm. 2013. Buffalo berry. Accessed April 8, 2014. <http://uncommonfruit.cias.wisc.edu/buffalo-berry-silver-buffalo-berry/>
- Cornell. 2013. Buffalo berries. June 14. Accessed April 8, 2014. <http://www.fruit.cornell.edu/mfruit/buffalo.html>.
- Esser, Lora L. 1995. *Sheperdia argentea*. *Fire Effects Information System*, [Online]. Accessed March 17, 2014.
- Fryer, Janet L. 2010. *Prunus americana*. *Fire Effects Information System*, [Online], May 5.
- Grubb, Brian H. 2007. "Bareroot Silver Buffaloberry." *Native Plants Journal* 233-235.
- Hartmann, Hudson T., Dale E. Kester, Jr. Fred T. Davies, and Robert L. Geneve. 2011. *Hartmann and Kester's Plant Propagation*. Upper Saddle River: Prentice Hall.
- Page, K. 2013. A Guide to Management of Wild Berry Patches: Cultural Preservation of the Apsaalooke Tribe. Research report for AGSC465R Health, Poverty, Agriculture: Concepts and Action Research. Montana State University-Bozeman. Dec. 10, 2013. 25 pp.
- Small, T. 2013. Increasing the reverence of the Apsaalooke Culture by embracing the holistic process: Case study on berry picking. Research report for AGSC465R Health, Poverty, Agriculture: Concepts and Action Research. Montana State University-Bozeman. May 5, 2013.
- NRCS. 2006. Silver Buffaloberry. February. Accessed April 8, 2014. http://plants.usda.gov/plantguide/pdf/pg_shar.pdf.
- Savory, Allan, and Jody Butterfield. 1999. *Holistic Management*. Washington, DC: Island Press.

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