



Plant Propagation Protocol for *Crataegus chrysocarpa* Ashe
ESRM 412 – Native Plant Production

TAXONOMY	
Family Names	
Family Scientific Name:	Rosaceae
Family Common Name:	Rose Family
Scientific Names	
Genus:	<i>Crataegus</i> L.
Species:	<i>chrysocarpa</i>
Species Authority:	Ashe
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s) (include full scientific names (e.g., <i>Elymus glaucus</i> Buckley), including variety or subspecies information)	<i>Crataegus aboriginum</i> Sarg. <i>Crataegus brunetiana</i> Sarg. <i>Crataegus brunetiana</i> var. <i>fernaldii</i> (Sarg.) E.J.Palmer <i>Crataegus caliciglabra</i> Schuette <i>Crataegus chrysocarpa</i> var. <i>longiacuminata</i> Kruschke <i>Crataegus chrysocarpa</i> var. <i>rotundifolia</i> (Ehrh.) Sarg. <i>Crataegus coccinata</i> Sarg. <i>Crataegus coloradoides</i> Ramaley <i>Crataegus columbiana</i> var. <i>chrysocarpa</i> (Ashe) Dorn <i>Crataegus doddsii</i> Ramaley <i>Crataegus faxonii</i> Sarg. <i>Crataegus faxonii</i> var. <i>durifrucata</i> Kruschke <i>Crataegus faxonii</i> var. <i>praecoqua</i> (Sarg.) Kruschke <i>Crataegus faxonii</i> var. <i>praetermissa</i> (Sarg.) E.J.Palmer

	<p><i>Crataegus horrida</i> Medik. <i>Crataegus illuminata</i> Sarg. <i>Crataegus laurentiana</i> var. <i>brunetiana</i> (Sarg.) Kruschke <i>Crataegus laurentiana</i> var. <i>dissimilifolia</i> Kruschke <i>Crataegus rotundifolia</i> (Ehrh.) Moench <i>Crataegus rotundifolia</i> var. <i>chrysoarpa</i> (Ashe) Eggl. <i>Crataegus sheridanii</i> A.Nelson <i>Crataegus sicca</i> var. <i>glabrifolia</i> (Sarg.) E.J.Palmer <i>Crataegus subrotundifolia</i> Sarg. <i>Oxyacantha chrysoarpa</i> (Ashe) Lunell ¹</p>
Common Name(s):	Fireberry hawthorn, Piper's hawthorn, eldhagtorn, golden berry hawthorn
Species Code (as per USDA Plants database):	CRCH
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	Fireberry hawthorn grows from Newfoundland to Pennsylvania and west to the Rocky Mountains. ⁹ See maps above.
Ecological distribution (ecosystems it occurs in, etc):	Although it will succeed in partial shade and different soil types, it grows best in full sunlight, well-drained loamy soils, and will tolerate wet soils becoming drought tolerant once established. It is also wind tolerant making it a good tree species in shelterbelt planting. It is also tolerant of atmospheric pollution and performs well in urban settings. ²
Climate and elevation range	1500m-2500m Woodland, Alpine, Continental, Mediterranean ³
Local habitat and abundance; may include commonly associated species	Can be grown in the garden throughout the whole year. It doesn't fear cold weather and it bears very harsh minimum temperatures. During the winter young plants could need a light protection from the wind or cold. ³
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Reproduces easily but is slow growing. Pollution- tolerator. Stress tolerator. ⁴
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	It is a large shrub or tree that grows to twenty feet tall. It is intricately branched and very thorny. Leaves are smooth to hairy, very broad, usually with several shallow lobes, often dull sometimes shiny. Flowers are produced in several clusters. Its nearly rounded fruits are either bright red or yellow. ²
PROPAGATION DETAILS	

Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Statewide ND, SD MN off-center field planting ⁵																												
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants, and cuttings ⁵																												
Propagation Method (Options: Seed or Vegetative):	Seed or Grafting ⁶																												
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Bareroot. Multi-row ⁵																												
Stock Type:	No information found																												
Time to Grow (from seeding until plants are ready to be outplanted):	Up to 2 years ⁶																												
Target Specifications (size or characteristics of target plants to be produced):	Higher germination rates ⁷ <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">Fireberry</th> </tr> <tr> <th style="text-align: center;">No. of seedlings</th> <th style="text-align: center;">% of 400 seeds</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">1</td><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">19</td><td style="text-align: center;">5^b</td></tr> <tr><td style="text-align: center;">18</td><td style="text-align: center;">5^b</td></tr> <tr><td style="text-align: center;">12</td><td style="text-align: center;">3^c</td></tr> <tr><td style="text-align: center;">71</td><td style="text-align: center;">18^b</td></tr> <tr><td style="text-align: center;">108</td><td style="text-align: center;">27^c</td></tr> <tr><td style="text-align: center;">106</td><td style="text-align: center;">27^c</td></tr> <tr><td style="text-align: center;">71+78^d</td><td style="text-align: center;">37^c</td></tr> <tr><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td style="text-align: center;">84</td><td style="text-align: center;">21</td></tr> </tbody> </table>	Fireberry		No. of seedlings	% of 400 seeds	0	0	0	0	1	0	19	5 ^b	18	5 ^b	12	3 ^c	71	18 ^b	108	27 ^c	106	27 ^c	71+78 ^d	37 ^c	0	0	84	21
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Propagule Collection (how, when, etc):	Collected when fully ripened. Pulp removed by maceration. All depulped seeds floated in water several times to remove empty seeds. ⁷
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	400 seeds ⁷
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Acid scarification followed by warm stratification and pre-chilling. If you harvest the seed “green”(fully developed embryo just before seed coat), it can germinate in spring and avoid pre-planting treatments. ⁶ 0 to 360 days of warm and cold stratification depending on warm and cold periods. 2 hour acid soak. After rinsed and treated with baking soda. ⁷
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Make sure area is moist and gets plenty of sun light ⁴ Drill rows eight to twelve inches apart ¹⁰
Establishment Phase (from seeding to germination):	Germinate in moist environment ⁸
Length of Establishment Phase:	1 year ¹⁰
Active Growth Phase (from germination until plants are no longer actively growing):	Slow growing ⁴ Pruning should be done in the winter or early spring in order to maintain a clear shoot leader on young trees and/or remove the weakest branches to allow more light to pass through. Suckers or stems arising from the roots should be removed when they become noticeable. ¹⁰ Containerized trees should be planted when they are no more than eight feet tall, in the fall or spring. Balled and burlapped trees should be planted in early spring. ¹⁰
Length of Active Growth Phase:	No information found
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for	During the winter young plants could need a light protection from the wind or cold; when putting the very young specimens, with a thin stem, in shelter, we should provide them with a high stake to keep them erect ³

winter):	
Length of Hardening Phase:	No information found
Harvesting, Storage and Shipping (of seedlings):	Seeds are stored at 4° C until treated to break dormancy. ⁷
Length of Storage (of seedlings, between nursery and outplanting):	No information found
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	When growing larger quantities, it might be best to sow them directly outdoors in a seedbed, but with protection from mice and other seed-eating creatures. Grow them on in the seedbed until large enough to plant out, but undercut the roots if they are to be left undisturbed for more than two years. ⁶
Other Comments (including collection restrictions or guidelines, if available):	
INFORMATION SOURCES	
References (full citations):	See Below
Other Sources Consulted (but that contained no pertinent information) (full citations):	. "Taxon: Crataegus chrysocarpa Ashe." USDA. N.p., 2002. Web. 16 May 2012. < http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?313702 >. . "Crataegus chrysocarpa Ashe." Absolute Astronomy. N.p., n.d. Web. 16 May 2012. < http://www.absoluteastronomy.com/topics/Crataegus_chrysocarpa >.
Protocol Author (First and last name):	Joey Shaughnessy
Date Protocol Created or Updated (MM/DD/YY):	05/15/12

Reference:

¹. "Crataegus chrysocarpa Ashe." GBIF. N.p., n.d. Web. 16 May 2012. <<http://ecat-dev.gbif.org/usage/112216385>>.

² Lorenzo, Alfredo. "Crataegus chrysoarpa Ashe." USDA Plant Guide. N.p., 09/01/2002. Web. 16 May 2012. <http://plants.usda.gov/plantguide/pdf/pg_crch.pdf>.

³ . "Crataegus chrysoarpa Ashe." Gardening.e. N.p., n.d. Web. 16 May 2012. <<http://www.gardening.eu/arc/plants/Masts/Crataegus-chrysoarpa-Ashe-var.-aboriginum-Sarg.-Kruschke/18020/stamp.asp>>.

⁴ Weir, . "Hawthorns of Colorado." *Hawthorns*. N.p., n.d. Web. 16 May 2012. <<http://www.westernexplorers.us/Hawthorns-2.pdf>>.

⁵ . Plant Materials Available for North Dakota, South Dakota, and Minnesota - 2007. N.p., n.d. Web. 16 May 2012. <http://www.mn.nrcs.usda.gov/intranet/bulletins07/190/190-7-1aplant_materials_available-2007.pdf>.

⁶ "Crataegus chrysoarpa Ashe." Plants for a Future. N.p., n.d. Web. 16 May 2012. <[http://www.pfaf.org/user/Plant.aspx?LatinName=Crataegus chrysoarpa](http://www.pfaf.org/user/Plant.aspx?LatinName=Crataegus%20chrysoarpa)>.

⁷ Morgenson, Greg. "Effects of Cold Stratification, Warm-Cold Stratification, and Acid Scarification on Seed Germination of 3 Crataegus Species.." MGR. N.p., n.d. Web. 16 May 2012. <https://docs.google.com/a/uw.edu/viewer?a=v&q=cache:KmcXR7pJzrUJ:www.rngr.net/publications/tpn/49-3/effects-of-cold-stratification-warm-cold-stratification-and-acid-scarification-on-seed-germination-of-3-crataegus-species/at_download/file&hl=en&gl=us&pid=bl&srcid=ADGEESic_04IRxf7o53MLRMb9XJcHibg_M6mgviz5KT8cjH SsNtCLRIKrRV9x5smAB2EhgGb6BKS9DrG7Brai01cOOBCPdRz9_snz0jtsykIvAEstfRQ2uIP5DbSEsXzvqc_uKElxKfO&sig=AHIEtbTr03oy4TdTdCjwmRWBMH6WcLk1MxA>.

⁸ "Fireberry hawthorn." National Resources Canada. N.p., n.d. Web. 16 May 2012. <<https://tidcf.nrcan.gc.ca/trees/factsheet/421>>.

⁹ . "BONAP's North American Plant Atlas." BONAP. N.p., n.d. Web. 16 May 2012. <<http://www.bonap.org/BONAPmaps2010/Crataegus.html>>.

¹⁰ . "Crataegus chrysoarpa Ashe." Encyclopedia of Life. N.p., n.d. Web. 16 May 2012. <<http://eol.org/pages/2506900/details>>