


Plant Propagation Protocol for [*L. tenerrima*]

ESRM 412 – Native Plant Production

Protocol URL: [https://courses.washington.edu/esrm412/protocols/\[HEBA2.pdf\]](https://courses.washington.edu/esrm412/protocols/[HEBA2.pdf])

| TAXONOMY | |
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| Plant Family | Asteraceae |
| Scientific Name | <i>Heterotheca barbata</i> |
| Common Name | Spokane False Goldenaster |
| Species Scientific Name | Barbata |
| Scientific Name | <i>Heterotheca barbata</i> (Rydb.) Semple |
| Varieties | <i>Heterotheca villosa</i> var. <i>minor</i> <i>Chrysopsis barbata</i> |
| Sub-species | |
| Cultivar | |
| Common Synonym(s) | |
| Common Name(s) | |
| Species Code (as per USDA Plants database) | HEBA2 (6) |
| GENERAL INFORMATION | |
| Geographical range |  <p>A very rare taxon native to eastern Washington state; Near the Columbia River in northeastern Washington, near the Spokane River in Spokane, Washington, and in the Spokane River Valley east of Spokane in Idaho. (1,2)</p> |
| Ecological distribution | Sandy plains; approximately 800 m elevation (2) |
| Climate and elevation range | Low to Mid-elevations (300 - 2900 meters) in temperate climate typical in western United States. Cannot survive temperatures lower than -33 degrees F. (6,3) |
| Local habitat and abundance | Gravelly, sandy, and loamy soils, crevices in granite, limestone rocks, marble rocks, eroded granites and sandstones, basaltic cliffs, lava flows, rocky slopes, dry ledges, stream banks, glacial outwashes, roadside railroad embankments, grasslands, ponderosa pine-oak woods, open pinyon-juniper associations. (6) |
| Plant strategy type / successional stage | This is native to the U.S. has its most active growth period in the spring and summer. The Hairy False Goldenaster |

(Villosa) has gray-green foliage and inconspicuous yellow flowers, with a moderate amount of conspicuous brown fruits or seeds. The greatest bloom is usually observed in the mid-summer, with fruit and seed production starting in the summer and continuing until fall. Leaves are not retained year to year.

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Plant characteristics

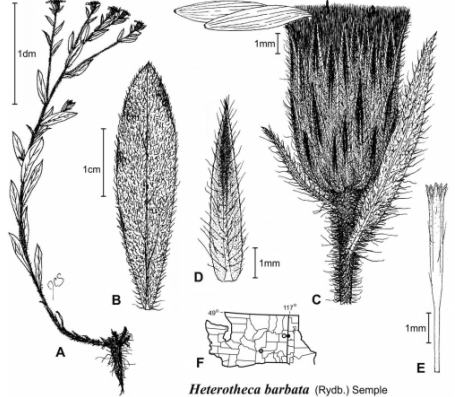


Figure 51. Morphology of *Heterotheca barbata*. A. Habit of holotype, one shoot shown. B. Mid stem leaf. C. Head with only some florets drawn. D. Mid series phyllary with chlorophyllous zone dark. E. Disc corolla at anthesis. F. Distribution; Washington and northern Idaho (© at *H. barbata*).

Stems decumbent to ascending-erect, (9-)16-33(-48) mm, sparsely to densely hispido-strigose, sparsely to abundantly long-hirsute, sparsely to densely stipitate-glandular. Distal cauline leaf blades usually narrowly to broadly oblanceolate or oblong, sometimes ovate (in mountains), (11-)16-28(-40) mm, ± reduced distally, bases usually narrowly to broadly convex-cuneate to attenuate, sometimes rounded, margins flat, sometimes remotely undulate, apices obtuse or acute, faces sparsely to moderately hispido-strigose, (1-75/mm²), sparsely to moderately glandular (glands 1-32/mm²). Heads 1-13(-42) in congested to open, corymbiform arrays, branches usually not very long. Peduncles 4.5-40(-60) mm, moderately to densely hispido-strigose, usually sparsely to moderately stipitate-glandular rarely eglandular; bracts usually linear-oblong, reduced, rarely linear-lanceolate and leaflike, sparsely to moderately hispido-strigose, sparsely to moderately stipitate-glandular. Involucres cylindric to campanulate (fresh), (5.5-)6.5-8.5(-9.3) mm. Phyllaries narrowly triangular-lanceolate, faces usually sparsely, rarely densely strigose (hairs to 1 mm), usually sparsely to moderately stipitate-glandular, rarely eglandular. Ray florets (7-)10-18(-26), laminae (4-)6-10(-12.6) mm.

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PROPAGATION DETAILS

Protocol information for *Heterotheca villosa*, closest information found to *H. barbata*, information to be used to establish new protocol for *H. barbata*.

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| Ecotype | Ecotype: 1 Yellowstone National Park accession periodically collected and produced from 1986 to 1988. Grassland ecological zone is Idaho fescue/bearded wheatgrass habitat. Elevation is 2,225 m (7,300 ft). (http://www.nativeplantnetwork.org/) |
| Propagation Goal | Seeds |
| Propagation Method | Seed |
| Product Type | Propagules (seeds, cuttings, poles, etc.) |
| Stock Type | N/A |

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| Time to Grow | N/A |
| Target Specifications | Harvest yields vary due to weather and age of stand. Average annual production is 105 kg/ha (94 lb./ac). |
| Propagule Collection Instructions | Wild land collection occurs early August to early September when the yellow flowers turn brown and the seed is tannish brown and hard; timing the harvest is difficult due to indeterminate ripening, and the low growth form compounds the problem. One collection hour/person will yield an average 20 grams (0.7 oz.) clean seed and varies by year, stand density, and collector experience. Seed collected in the wild commonly has no fill. |
| Propagule Processing/Propagule Characteristics | Seed Processing: Seed is spread out on a tarp in a dry, sheltered environment and turned daily for approximately 3-5 days, until no moisture or warmth is detected. Seed is threshed with a hammer mill through a 4/64" round hole screen, air-screen processed on an Office Clipper over a 1-16" round hole screen with very low wind. Due to very small seed, large quantities of floral chaff, and poor seed flow, this species is moderately difficult to clean. Larger seed lots are processed most efficiently with mechanized cleaning equipment and smaller seed lots usually require more hand labor. Seeds/Kg: 1,671,000. Purity: 100%. |
| Pre-Planting Propagule Treatments | Seed treatments: None. |
| Growing Area Preparation / Annual Practices for Perennial Crops | Propagation Environment: Seedbed is firm and free of weeds with good field moisture to 4" depth. Seed Propagation Method: Direct seeding. |
| Establishment Phase Details | Sowing Date: Early spring. Sowing/Planting Technique: 25-30 pure live seed/ft. (0.3 m) row, irrigated 91cm (36 in) row spacing, seeded with 2-row double-disk planter with depth bands, optimum seeding depth 0.6 cm (0.25 in). Establishment Phase: Soil surface is kept moist throughout the 14 day germination and emergence period (also helps prevent soil crusting). Fertilizer application is not recommended the first year, as it generally stimulates weed growth and competition. |
| Length of Establishment Phase | 2 growing seasons. |
| Active Growth Phase | Rapid Growth Phase: Spring to fall; soil moisture is critical during budding stage, after anthesis, and post-harvest to pre-freeze up –no irrigation is applied during flowering (pollination); fertilizer is broadcast at 100 lbs actual N/40 lbs actual P/acre in mid-September. |
| Length of Active Growth Phase | 2 to 3 growing seasons. |

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| Hardening Phase | N/A |
| Length of Hardening Phase | N/A |
| Harvesting, Storage and Shipping | <p>Harvest Date: Cultivated harvest occurred July 15 at the Bridger Plant Materials Center. Hand-harvesting is required because the seedheads are low to the ground.</p> <p>Seed Storage: Seed is placed in cloth or plastic seed sacks and stored in a cool, dry environment.</p> |
| Length of Storage | Storage Duration: 5 to 7 years. |
| Guidelines for Outplanting / Performance on Typical Sites | Outplanting Site: Midway Geyser Basin. |
| Other Comments | |
| INFORMATION SOURCES | |
| References | <ol style="list-style-type: none"> 1. "Astereae Lab; Heterotheca barbata." University of Waterloo, n.d. Web. 19 May 2014. <https://uwaterloo.ca/astereae-lab/heterotheca-barbata>. 2. "Heterotheca barbata — Details Spokane False Golden-aster." Encyclopedia of Life.org, n.d. Web. 19 May 2014. <http://eol.org/pages/590996/details>. 3. "Herbarium Database." Burke Museum, 1 Jan. 2014. Web. 19 May 2014. http://biology.burkemuseum.org/herbarium/collections/results.php?SourcePage=search.php&Lat=47.04&Lng=-120.8&Zoom=6&Polygons=&submit=+Search+&TaxonomicGroup=&Family=&Genus=heterotheca+&Species=villosa&Infraspecies=&Collector=&CollNum=&Day=&Month=&Year=&Accession=&Barcode=&Cultivated=&Origin=&Phenology=&TypeDesignation=&Country=&State=&County=&Locality=&MinElev=&MaxElev=&ElevUnit=ft.&SortBy=Year&SortOrder=DESC 4. "ITS Report; Heterotheca barbata (Rydb.) Sempel." ITS.gov, n.d. Web. 19 May 2014. <http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=502968>. 5. Protocol Search." Native Plant Network, Web. 19 May 2014. http://www.nativeplantnetwork.org/Network/ViewProtocols.aspx?ProtocolID=894&referrer=wildflower. 6. Reaume, Tom. <i>620 wild plants of North America: fully illustrated</i>. Regina, Sask: Canadian Plains Research |

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| | <p>Centre, University of Regina; 2009. Print.</p> <p>7. Semple, John C. "Heterotheca villosa var. minor (Hook.) Semple." <i>Flora of North America 20: Southwest Environmental Information Network</i>. Web. 19 May 2014.</p> <p>8. "Spokane False Goldenaster Heterotheca barbata (Rydb.) Semple." Gardening.eu, 2011. Web. 19 May 2014. <http://www.gardening.eu/arc/plants/Shrubs/Heterotheca-barbata-Rydb.-Semple/33558/>.</p> <p>9. "USDA Plant Profile". USDA NRCS, n.d. Web. 19 May 2014. <http://plants.usda.gov/core/profile?symbol=HEBA2>.</p> |
| Other Sources Consulted | <p>1. "Hairy False Goldenaster (Villosa)." gardenguides.com, 2010. Web. 19 May 2014. <http://www.gardenguides.com/taxonomy/hairy-false-goldenaster-heterotheca-villosa/>.</p> <p>2. "Plant Database / Chrysopsis barbata plant care." myfolia.com, n.d. Web. 19 May 2014. <http://myfolia.com/plants/40169-chrysopsis-barbata-chrysopsis-barbata>.</p> <p>3. "Plant Database / Spokane False Goldenaster plant care." myfolia.com, n.d. Web. 19 May 2014. <http://myfolia.com/plants/40168-spokane-false-goldenaster-heterotheca-barbata>.</p> <p>4. Protocol Search." Native Plant Network, 1 Jan. 2014. Web. 19 May 2014. http://www.nativeplantnetwork.org/Network/ViewProtocols.aspx?ProtocolID=1392.</p> <p>5. The Plant List (2010). Version 1. Published on the Internet; Accessed 19 May 2014. http://www.theplantlist.org/</p> |
| Protocol Author | James Day |
| Date Protocol Created or Updated | 05/19/2014 |