

## Plant Propagation Protocol for *Adoxa moschatellina*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2022/ADMO.pdf>



*Adoxa moschatellina*, Dan Ruda. Via Minnesota DNR.

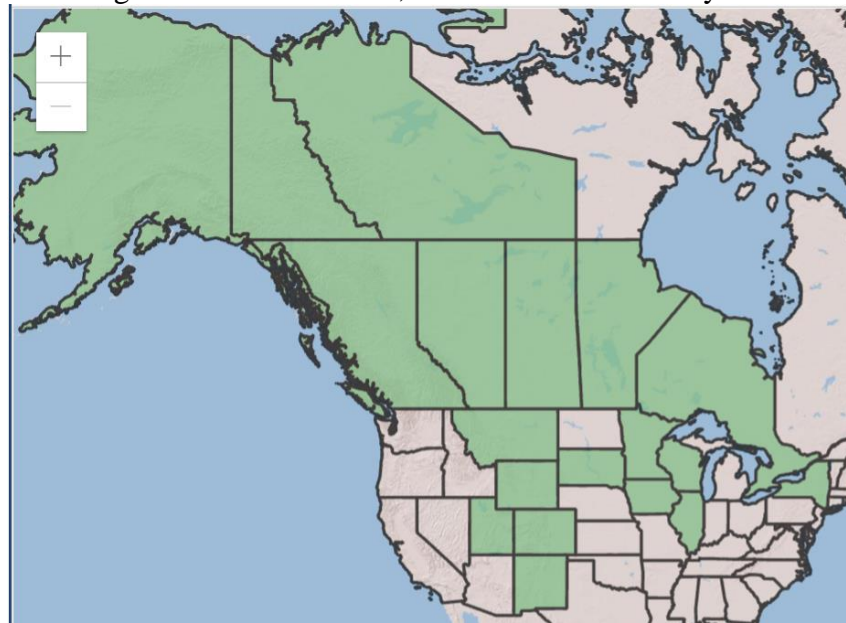
| TAXONOMY                |           |
|-------------------------|-----------|
| Plant Family            |           |
| Scientific Name         | Adoxaceae |
| Common Name             | Moschatel |
| Species Scientific Name |           |

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| Scientific Name                            | <i>Adoxa moschatellina</i> L.   |
| Varieties                                  | No varieties are recognized by USDA <sup>9</sup> .  |
| Sub-species                                | No sub-species recognized by USDA <sup>9</sup> .  |
| Cultivar                                   | No cultivars recognized by USDA <sup>9</sup> .  |
| Common Synonym(s)                          | None recognized by USDA <sup>9</sup> .  |
| Common Name(s)                             | Muskroot, town hall clock, five-faced bishop, hollowroot, tuberous crowfoot <sup>3, 8, 11</sup> |
| Species Code (as per USDA Plants database) | ADMO  |

### GENERAL INFORMATION

#### Geographical range

From Alaska to New Mexico, extending east to New York<sup>9</sup>.  
Circumpolar distribution<sup>2</sup>.  
The USDA plant database does not currently display *A. moschatellina* occurring in the PNW<sup>9</sup>. Hence, there is a lack of county level data.



USDA map of *A. moschatellina* range in North America. Via USDA plants database.

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| Ecological distribution                  | Well shaded understory of mesic hardwood forests and talus areas <sup>2</sup> . Northern wetland forests <sup>9</sup> . Western coulee and ridges landscape of western Wisconsin, particularly in exposed wet areas at the base of slopes or cliff faces <sup>8</sup> .  |
| Climate and elevation range              | Temperate circumpolar climates <sup>2,3</sup> .<br>Low elevations <sup>3</sup> .   |
| Local habitat and abundance              | <i>Adoxa moschatellina</i> has been associated with various species, as part of their understory community, including: <i>Tsuga canadensis</i> (Canada hemlock), <i>Betula alleghaniensis</i> (yellow birch) and <i>Acer saccharum</i> (sugar maple) <sup>8</sup> .<br>Across its range <i>A. Moschatellina</i> is generally a rare plant.   |
| Plant strategy type / successional stage | Stress Tolerator <sup>6,11</sup> .   |
| Plant characteristics                    | <ul style="list-style-type: none"> <li>• Deciduous herbaceous understory forb<sup>9,11</sup>.</li> <li>• Rhizomatous and perennial<sup>9,11</sup>.</li> <li>• Yellow flowers in terminal cluster with 1 central and 4 lateral flowers, often described as resembling a “town hall clock”<sup>11</sup>. Described as having a musky odor<sup>11</sup>. 5-7 mm diameter<sup>11</sup>.</li> </ul> |
| <b>PROPAGATION DETAILS: Seed</b>         |  |
| Ecotype                                  | N/A  |
| Propagation Goal                         | Plants   |
| Propagation Method                       | Seed   |

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| Product Type   | Container (plug) plants   |
| Stock Type   | 1.5 inch container (SC10 Cells) <sup>7</sup> .  |
| Time to Grow   | 6 months <sup>3</sup> .   |
| Target Specifications  | Height: approximately 5 inches<br>Multiple well-formed and healthy leaves evident   |
| Propagule Collection Instructions                                  | Seeds should be collected in June <sup>10</sup><br>Given the potentially vulnerable nature of <i>A. moschatellina</i> seed collection should be done so as to minimize risk to wild populations <sup>8</sup> .  |
| Propagule Processing/Propagule Characteristics                     | <i>A. moschatellina</i> seeds have a low success rate in the wild as such seed viability testing may be advantageous to ensure that collections of seed produced usable propagules <sup>4,7</sup> .   |
| Pre-Planting Propagule Treatments                                  | <ul style="list-style-type: none"> <li>• Warm-Cold stratification is required to break dormancy<sup>1</sup>.</li> <li>• Effective germination temperature is 20° C<sup>1</sup></li> <li>• Germination requirements are associated with the growth strategy of <i>A. moschatellina</i>, germinating in autumn to take advantage of the more open canopy during the season<sup>1</sup></li> </ul>   |
| Growing Area Preparation /<br>Annual Practices for Perennial Crops | <ul style="list-style-type: none"> <li>• Shaded conditions such as a shaded greenhouse or shadehouse<sup>8</sup>.</li> <li>• Soils: 1:1 sphagnum peat moss and perlite blend initially. After up-potting it is recommended to transition to media including a small sample of native soil for inoculation with beneficial soil microorganisms, mossy, and which is slightly acidic<sup>7,8</sup>.</li> <li>• 4x14x20 Dyna-flats<sup>7</sup>.</li> </ul> |

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| Establishment Phase Details      | <ul style="list-style-type: none"> <li>Given the low seeding success of <i>A. moschatellina</i> seeds should be sown at high density<sup>4</sup>.</li> <li>Germination is expected to occur at 20 degrees Celsius<sup>1</sup>.</li> </ul>  |
| Length of Establishment Phase    | 2-3 months <sup>1</sup> .  |
| Active Growth Phase              | <ul style="list-style-type: none"> <li>Grow in a hoophouse or shadehouse through <sup>7</sup>.</li> <li>Up-pot individual <i>A. moschatellina</i> plants to 1.5-in. tubes <sup>7</sup>.</li> <li>Water frequently<sup>8</sup>.</li> </ul>  |
| Length of Active Growth Phase    | 2 months   |
| Hardening Phase                  | <p>Insufficient information on <i>A. moschatellina</i> hardening is available to provide specific recommendations.</p> <ul style="list-style-type: none"> <li>Maintaining appropriate shade coverage and moisture conditions replicating outplanting conditions is advisable<sup>8</sup>.</li> </ul> |
| Length of Hardening Phase        | Approximately 1-2 month(s) from end of active growth phase to die back in June <sup>3,8</sup> .  |
| Harvesting, Storage and Shipping | Propagules can be transported to outplanting site in their SC10 cells <sup>7</sup> .   |
| Length of Storage                | 1-2 months   |

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| Guidelines for Outplanting /<br>Performance on Typical Sites | <p>If successfully established <i>A. moschatellina</i> may be expected to flower in April-May 1-5 years following outplanting<sup>2,5</sup>.</p> <p>Outplanting sites should be in well-shaded, wet conditions at the base of slopes<sup>8</sup>.</p> <p>Areas where mowing may occur or where <i>A. moschatellina</i> may be mistaken for herbaceous weeds should be avoided<sup>8</sup>.</p>   |
| Other Comments   | <ul style="list-style-type: none"> <li>• Depending on the state <i>A. moschatellina</i> may possess protected or endangered status. As such harvesting of seeds should only be undertaken with appropriate permits at designated legal sites.</li> <li>• Due to its rarity, there is limited information available regarding many aspects of propagating <i>A. moschatellina</i>. Where possible specific recommendations for the species have been used. In some instances, due to limited sources best practices established for herbaceous forbs were drawn upon<sup>5,7</sup>.</li> <li>• More species specific information was available pertaining to the species germination requirements and phenology<sup>1,4,11</sup></li> </ul>   |
| <b>INFORMATION SOURCES</b>                                   |  |
| References   | <ol style="list-style-type: none"> <li>1. Blandino, C. (2017). Comparative seed biology of European temperate forest herbs. Ph.D Thesis. University of Pavia.<br/><a href="https://iris.unipv.it/retrieve/handle/11571/1215986/205764/PhD%20Thesis%20C.%20Blandino.pdf">https://iris.unipv.it/retrieve/handle/11571/1215986/205764/PhD%20Thesis%20C.%20Blandino.pdf</a></li> <li>2. DNR MN. (2022). Rare species guide: Adoxa moschatellina L. Minnesota Department of Natural Resources. Retrieved from:<br/><a href="https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&amp;selectedElement=PDADO01010&amp;msclkid=a95661bac36511eca4118c99689be266">https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&amp;selectedElement=PDADO01010&amp;msclkid=a95661bac36511eca4118c99689be266</a></li> </ol> |

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| Other Sources Consulted          | Toogood, A. (2019). <i>Propagating Plants: Revised new edition</i> . DK Publishing. New York. Print. |
| Protocol Author                  | Alexander Avila  |
| Date Protocol Created or Updated | 05/25/2022   |