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Title: Evaluating broadleaved evergreen groundcovers for drought tolerant landscapes in the Pacific Northwest

Background: Weed control is the most costly form of pest management in most landscapes. Weed
management in the landscape can be accomplished a number of ways, but one of the most effective is the
use of evergreen groundcovers. A groundcover shades the soil surface in the same way as a mulch by
conserving moisture and suppressing weeds, but also offers ornamental interest through the year.
Groundcover plants are especially useful in parking lots, roadsides, and other situations where low
maintenance is a requirement.

A number of plants have been used as a groundcover in Northwest landscapes, including coniferous and
broadleaf plants. Broadleaf plants offer flowers as well as diverse foliage; of the many broadleaf species
utilized worldwide, only a few have been used in Northwest landscapes. These include various Cotoneaster
species and cultivars, Arctostaphylos uva-ursi (Kinnikinnick or Bearberry), Vinca minor and V. major
(Periwinkle), and Genista lydia and G. pilosa (carpet broom) and Viburnum davidii. With the exception of
carpet broom, all these species perform better with summer irrigation.

Irrigation is very common in the summer-dry Northwest; however its use promotes problems with summer-
annual weeds. Management of these weeds requires either additions of mulch, hand removal, or herbicides.
Deletion of irrigation eliminates most of these problems but would mandate use of plants tolerant of
summer-dry conditions. Over the last 10 years, several evaluations at the OSU North Willamette Research
and Extension Center (NWREC) have focused on growing broadleaved evergreen ornamental plants from
several genera, including Ceanothus, Cistus, Halimium, and Grevillea. These field evaluations seek to
identify those plants able to grow under “low-input” conditions (i.e., without irrigation, fertilizer, or
pruning) and still retain good landscape quality. A similar evaluation is currently being conducted on
Arctostaphylos, which was highlighted in the March, 2017 Digger Magazine, and has led to the inclusion of
these species in a number or Oregon nurseries.

Although the previous evaluations of drought-tolerant plants have identified some plants from each genus
suitable for use as groundcovers, they have not specifically focused on identifying plants that are best
utilized as groundcovers in a comparative study. Furthermore, there are many more drought-tolerant plants
in other genera suitable for consideration as groundcovers which are currently not utilized in the Northwest.
We propose to establish an evaluation whose primary goal is to evaluate broadleaved evergreen
groundcovers for use in un-irrigated landscapes.
Project Objectives

1. Evaluate new drought-tolerant cultivars for suitability in the PNW climate
2. Determine production scheduling for the cultivars to reach a saleable size
3. Provide propagative cuttings from the trial for local nurseries to utilize for sales

Final Results:

Cuttings of 30 species and cultivars of broadleaved evergreen groundcovers (i.e. not including coniferous species) were obtained from a Mediterranean groundcover nursery (Pepiniere Filippi) in Meze, France in October 2017. Upon return the cuttings were stuck at NWREC in community trays using 2:1 perlite:peat mix and dipped in a 1:7 ratio of Dip n’ Grow. Plants were well rooted by February 2018 and were potted into 4” pots using Pro-Gro 5F mix, then upshifted to 1 gallon pots in May of 2018. Plants were well-rooted and “saleable” by September 2018.

In November 2018, the established plants in gallon containers were used as stock plants to obtain more cuttings to ensure plants from the trial were all of the same age and size. Additional underutilized plants from local and California nurseries as well as current landscape standards (for comparative purposes) were also propagated at this time so that they also could be added to the trial. After all plants were propagated during winter 2018/2019, they were upshifted to 4” containers in early March 2019, then upshifted again at the end of May to quarts or 2 gal pots (for the rock rose species) depending upon growth. All plants were potted into Pro-Gro 5F mix and top-dressed with the low rate of Harrell’s 17-6-12 fertilizer.

Seventy-nine different accessions from 37 different genera were planted into a field at NWREC located adjacent to the Bureau of Reclamation Agrimet weather station at NWREC (http://www.usbr.gov/pn/agrimet/) on Sept. 10th, 2019 (See Appendix for plant list). Plants were arranged in a Completely Randomized Design with five replications in the field. Plants were irrigated at planting, but fertilizer and additional irrigation will not be used, allowing evaluation of plants in a low-input scenario. The planting consists of rows spaced 8’ apart with an in-row spacing of 5’.

The data to be collected starting in spring 2020 are:

1. Plant height and width (collected annually in spring)
2. Plant form and foliage quality
3. Winter injury data (collected each spring or as required on a 0-5 scale).
4. Flowering data – timing and flower color (collected weekly in season).
5. Pest and disease information

After plant establishment nurseries will be able to collect cuttings from plants that are determined to be successful for the landscape. Results will be shared through trade articles such as “Digger Magazine” as well as other means such as the Northwest Plant Evaluation Program website.

Benefit to Nursery Industry

The Northwest Plant Evaluations program, which started in 2000 has evaluated numerous plant cultivars and species for the Pacific Northwest climate and one of the aims of the program is to introduce new cultivars into the nursery trade at the retail and wholesale level. Fifteen wholesale and retail nurseries have utilized the trials over the last 17 years to obtain cuttings to establish these plants in their own nursery stock and have added these to their nursery sales. Accessions from the evaluations which have thus far been utilized by the nursery industry for sales include: 11 Hebe cultivars, 14 Cistus, 4 Halimium, 1 Grevillea and 8 Arctostaphylos. Data regarding production timing will assist growers with production schedules and ease the adoption of the new cultivars.
Planted drought tolerant ground cover plot in December 2019.

### Appendix: Trial Plant List

<table>
<thead>
<tr>
<th>Species</th>
<th>Second Species</th>
<th>Third Species</th>
<th>Fourth Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arctostaphylos hookeri 'Buena Vista'</td>
<td>Ceanothus gloriosus var. porrectus</td>
<td>Halimium lasianthum 'Formosum'</td>
<td>Prunus laurocerasus 'Mount Vernon'</td>
</tr>
<tr>
<td>Arctostaphylos nevadensis 'Knightii' SBH 103</td>
<td>Cistus 'Snowfire'</td>
<td>Halimium lasianthum 'Sandling'</td>
<td>Rhodanthemum hosmariense</td>
</tr>
<tr>
<td>Arctostaphylos nummularia (select form)</td>
<td>Cistus x curvisilica</td>
<td>Helianthemum nummularium 'Ben Ledi'</td>
<td>Ribes viburnifolium 'Catalina Perfume'</td>
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<tr>
<td>Arctostaphylos nummularia 'Bear Belly'</td>
<td>Cistus x dansereauiae 'Decumbens'</td>
<td>Helianthemum nummularium 'Cheviot'</td>
<td>Rosa (Easy Elegance) Screaming Neon Red</td>
</tr>
<tr>
<td>Arctostaphylos nummularia SBH 12165</td>
<td>Cistus x obtusifolius</td>
<td>Helianthemum nummularium 'Henfield Brilliant'</td>
<td>Rosa (Easy Elegance) Yellow Brick Road</td>
</tr>
<tr>
<td>Arctostaphylos uva ursi 'Anchor Bay'</td>
<td>Cistus x florentinus 'Tramontane'</td>
<td>Helichrysum heldreichii</td>
<td>Rubus calycinoides</td>
</tr>
<tr>
<td>Arctostaphylos uva-ursi 'Green Supreme'</td>
<td>Cistus x pauranthus 'Natcha'</td>
<td>Helichrysum 'Miel et Curry'</td>
<td>Salvia 'Bee's Bliss'</td>
</tr>
<tr>
<td>Arctostaphylos uva-ursi 'Massachusetts'</td>
<td>Cistus x pulverulentus 'Sunset'</td>
<td>Helichrysum stoechas</td>
<td>Salvia sonomensis SBH 12232</td>
</tr>
<tr>
<td>Arctostaphylos uva-ursi 'Radiant'</td>
<td>Convolvulus cneorum 710-001</td>
<td>Hypericum balearicum</td>
<td>Santolina benthamiana</td>
</tr>
<tr>
<td>Arctostaphylos uva-ursi 'Vancouver Jade'</td>
<td>Cotoneaster 'OSUCOT1'</td>
<td>Hypericum tomentosum</td>
<td>Santolina magonica</td>
</tr>
<tr>
<td>Atriplex halimius</td>
<td>Cotoneaster glaucophyllum</td>
<td>Ilex crenata 'Helleri'</td>
<td>Santolina viridis 'Primrose Gem'</td>
</tr>
<tr>
<td>Baccharis pilularis 'Pistol Pancake'</td>
<td>Cotoneaster H2011-02-005</td>
<td>Lavandula dentata var. candidans</td>
<td>Satureja gilliesii</td>
</tr>
<tr>
<td>Ballota hirsuta</td>
<td>Erica carnea 'Springwood Pink'</td>
<td>Lavandula lanata</td>
<td>Satureja thymbra</td>
</tr>
<tr>
<td>Ballota pseudodictamnus</td>
<td>Erica x darleyensis 'Mary Helen'</td>
<td>Lavandula x heterophylla 'Devantville'</td>
<td>Teucrium capitatum ssp. majoricum</td>
</tr>
<tr>
<td>Brachyglottis greyi</td>
<td>Erica x darleyensis 'White Perfection'</td>
<td>Lavandula x losae</td>
<td>Thymus capitatus</td>
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<tr>
<td>Buxus sinica 'Tide Hill'</td>
<td>Euonymus fortunei 'Emerald n Gold'</td>
<td>Leptospermum rupestre (low form)</td>
<td>Trachelospermum jasminoides 'Pink Showers'</td>
</tr>
<tr>
<td>Callistemon pityoides 'Mt. Kosciusko'</td>
<td>Genista pilosa</td>
<td>Leptospermum rupestre 'Squiggly'</td>
<td>Trachelospermum mandianum</td>
</tr>
<tr>
<td>Calluna vulgaris 'Dunneth Lime'</td>
<td>Grevillea australis</td>
<td>Lonicera crassifolia</td>
<td>Vinca 'Merlot'</td>
</tr>
<tr>
<td>Ceanothus gloriosus 'Anchor Bay'</td>
<td>Grevillea 'Molonglo'</td>
<td>Lonicera pileata 'Royal Carpet'</td>
<td>Vinca minor 'Bowles'</td>
</tr>
<tr>
<td>Ceanothus gloriosus 'Emily Brown'</td>
<td>Grevillea 'Poorinda Leane'</td>
<td>Pittosporum tobira 'Green Compact'</td>
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</tbody>
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