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## Planting and maintaining prairie bulbs and rootstocks

Some of the Willamette Valley's most spectacular wildflowers appear early in spring from bulbs and perennial rootstocks. Most of these early growers flower and set seed before mid-summer and are completely dormant before the end of July.



Figure 1: *Brodiaea coronaria* in early July

Propagation from dormant bulbs or rootstocks makes these beautiful plants easy to grow and maintain in a variety of landscape settings. And now, Scholls Valley is producing bulbs and rootstocks at a scale and cost that makes planting them economical for landscapes of any size.

The key to success with bulb-based propagation is **proper planting depth and competition management**. If bulbs are set to an appropriate depth and emerge into open growing conditions, they will be able to reliably grow, flower and set seed for years. While it is possible to manually set individual bulbs using a dibble or trowel, larger numbers of bulbs present an opportunity to more economically and effectively establish populations in visually stunning drifts and patches. This can be achieved by incorporating bulbs mechanically into native soil, or by covering them with compost or other weed-free soil. Both methods are effective.

In **new restoration sites**, to **mechanically incorporate bulbs** in native soil, it is best to summer-fallow, either chemically or with cultivation. If herbicides are applied, be careful not to use products with residuals to which bulbs or rootstocks may be sensitive. In fall as soon as soil is moderately moist, use a chisel plow, moldboard plow or other implement that leaves 3 to 6-inch furrows. Different soil types and conditions will affect choice of implement. Once the field is furrowed, bulbs can be manually dropped, flung or spin-spread in patches of any desired density, size and configuration. After the bulbs are dispersed, a finish disc, chain harrow or other finishing implement can cover the bulbs, setting them at 2-4 inches below the finished surface.

In **established grasslands**, thatch reduction and control of existing competition are essential to successful propagation. Fall burning, flail-mowing, mechanical scarification or intensive grazing can all help with initial knock-down. Once the site is cleared, bulbs can be spread directly on the ground in patches or drifts, then covered with compost or weed-free soil blend to a depth of 2-4 inches. This depth of soil or compost will suppress or kill most existing vegetation and provide open initial conditions for bulb growth and establishment. Minimum patch size depends on the type of existing vegetation and anticipated management treatments. Small patches might rapidly be overgrown with surrounding vegetation if no treatments are applied to manage vegetation height. In general, patches should be at least five to six feet in diameter.



*Figure 2: mechanical scarification in established prairie*



Figure 3: A mass planting of *Allium ampletens*

Within patches, **bulb spacing** can vary significantly based on desired effect and budget. For large projects with limited budgets, maximizing extent and long-term establishment of large populations might dictate a combination of wider spacing of bulbs within patches, wider spacing between patches and smaller patches. For intensive landscaping area, denser plantings can create dazzling displays of color that, with multiple species, can add blooms to any landscape from April through the end of June or later.

Bulbs are remarkably adaptable to **poor-quality soils**, and can be established on rocky, gravelly compacted areas, old fields and waste areas. Simply clear any existing vegetation as noted above, spread bulbs at desired spacing and cover with clean soil or compost. Subsoiling is not required, and bulb-formers will actually benefit from the reduction of competing vegetation that shallow, poor soils afford. Many species of lilies will thrive in these settings.

Generally, if sited correctly, native lilies and other bulb-formers **need no irrigation** as long as soil stays moist through their vegetative and early flowering stages. Both species of *Camas*, as well as *Perideridia*, *Triteleia*, *Brodiaea* and even *Allium* are tolerant of hydric clay soils as long as these dry down by late summer. All of these species are very tolerant of even the most severe summer drought, and are at their most dormant during this period, which for some species begins as early as July. In this state of dormancy, bulbs are easily transplanted and are robust to long-term storage (up to three months) and handling required for transport and planting.

Bulb phenology provides many **long-term maintenance** options, including late-season mowing, burning, grazing, spraying and re-topping. These treatments replicate or simulate habitat

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Figure 4: *Dichelostemma congestum* in mass planting with *Eschscholzia californica*

disturbance events that bulb species depend upon to compete with aggressive prairie grasses and forbs. After bulb dormancy (June-July depending on species), treating the bulb area with one or more of the above-listed treatments every 1-2 years is sufficient to build and maintain robust populations of prairie bulbs, and is often rejuvenating for many other prairie plant populations, which are generally adapted to, and rely upon, frequent disturbance. As with any maintenance regimen, it is beneficial to rotate different disturbance treatments and different treatment timings to avoid favoring and/or dis-favoring the same plant populations year after year.

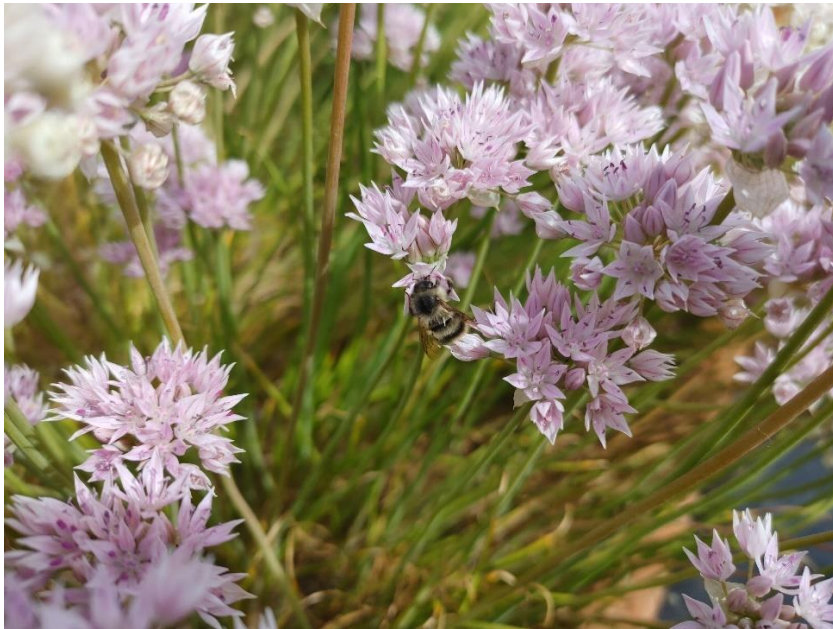


Figure 3: narrow-leaf onion with small *Bombus*

Once established, bulb-forming plants provide great early and mid-season **pollinator** support for beetles, flies, lepidopterans and especially bees. Some species are also important food for mammals, including the Willamette Valley pocket gopher and several other native rodent species. The burrows of these species, in turn, provide refuge for snakes, frogs, and a multitude of invertebrates. Many, including yampah and camas, were important foods of native tribes. As such, the lilies and other bulb-forming species were an integral part of local

prairies and essential to their diversity and function.

Due to their rarity and difficulty of seed collection, many species of prairie lilies and other perennial forbs have not been available for restoration of local prairies. Now, high-quality bulbs and rootstocks of several species are available, allowing large-scale reintroduction of these critically important and beautiful plants to local natural areas.