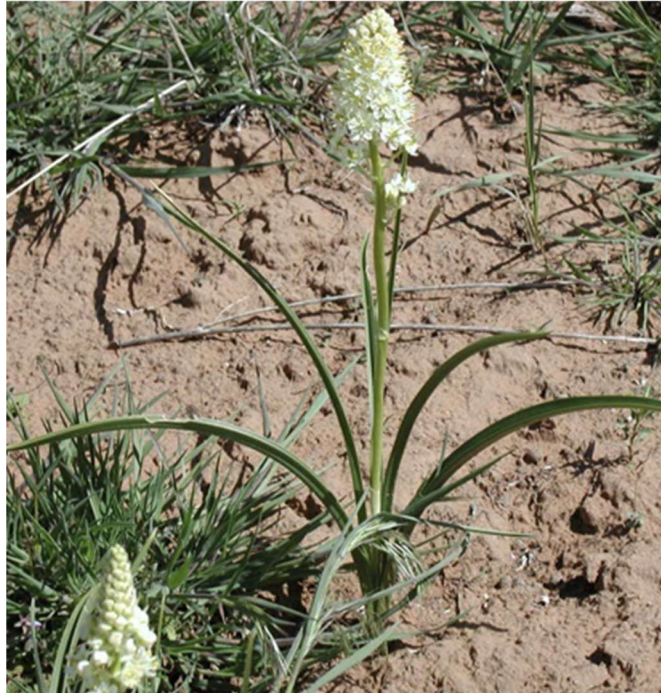


Plant Propagation Protocol for *Zigadenus venenosus*

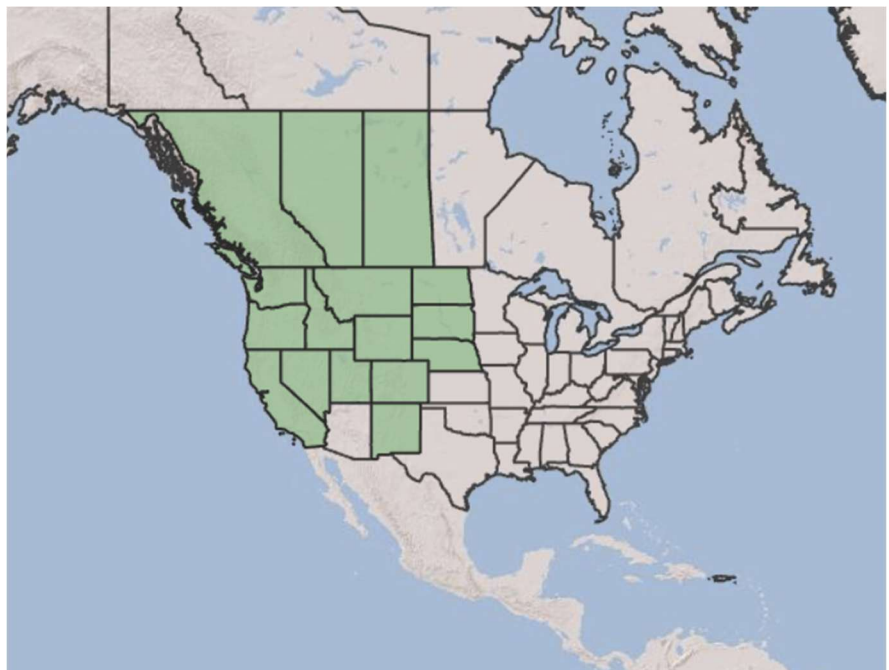
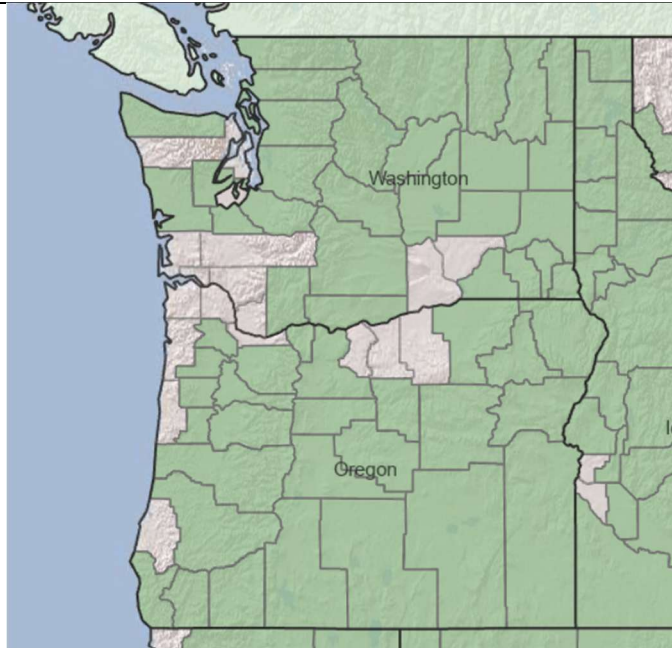
ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2025/ZIVE.pdf>



Eve Warren, USDI BLM. https://plants.usda.gov/DocumentLibrary/plantguide/pdf/pg_zive.pdf

TAXONOMY	
Plant Family	
Scientific Name	<i>Melanthiaceae</i> (previously in the <i>Liliaceae</i> family) ¹
Common Name	Bunchflower
Species Scientific Name	
Scientific Name	<i>Zigadenus venenosus</i> S. Watson
Varieties	<i>Zigadenus venenosus</i> S. Watson var. <i>venenosus</i> ; <i>Zigadenus venenosus</i> S. Watson var. <i>gramineus</i> (Rydb.) Walsh ex M. Peck
Sub-species	n/a
Cultivar	n/a
Common Synonym(s)	Toxicoscordion venenosum var.
Common Name(s)	Death camas, meadow death camas, grassy death camas, deathcamas, hog potatoes (U.S. Forest Service)
Species Code (as per USDA Plants database)	ZIVE
GENERAL INFORMATION	
Geographical range	



<https://plants.usda.gov/plant-profile/ZIVE>

Ecological distribution	Occurs on coastal prairies, wet & drying meadows, along creeks, in open forests and forest edges, and on rocky bluffs, grassy hillsides, and sagebrush slopes. ^{2,3}
Climate and elevation range	The optimal elevation range is 420- 2400m. Specifically for grassy meadow, death camas is 1200-2100m. ^{2,3}
Local habitat and abundance	Forests with Douglas-fir, Ponderosa pine, Western white pine, Fir-spruce, Hemlock-Sitka spruce, Larch, Lodgepole pine, and Redwood trees. ² Seen in grasslands and sagebrush ecosystems in addition to forests. ³

Plant strategy type / successional stage	Adapted to disturbed sites, however, it is shade-intolerant. ³ Regenerates rapidly after fire from deep, underground bulbs. ²
Plant characteristics	Perennial, cool-season forb. It has linear grass-like leaves mostly arising below the middle of the stem. Flowers are in panicles with creamy white petals around ¼ to 1 inch long. ³
SEED PROPAGATION DETAILS	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	
Time to Grow	Around 2-3 years.
Target Specifications	Ideal height is 6- 28 inches (15-70 cm). Roots are short and sparse, generally penetrating 6 inches (15cm) into the soil from the bulb depth. Bulbs are from 0.5 to 1.5 in. (1-4 cm) in diameter. ^{2,3}
Propagule Collection Instructions	Flowers bloom from April to July. Seeds come from mature capsules and seed dissemination is largely in July and August. Seeds are officially collected in August when the capsules begin to split. All seeds and capsules should be handled with care due to the toxicity of the entire plant. ³
Propagule Processing/Propagule Characteristics	Seeds come from mature capsules and can be cleaned with a hammermill and air screen cleaner. ³
Pre-Planting Propagule Treatments	It should be placed in cold/moist stratification for 90 days to result in higher germination. ^{2,3}
Growing Area Preparation / Annual Practices for Perennial	Use Ray Leach Super cell containers filled with Sunshine # 4 with a thin layer of coarse grit over the top. ⁴ : Water deeply and place outside where seeds can grow effectively. ⁵
Establishment Phase	Containers remain outside and are watered only during dry spells. Germination begins as daytime temperatures warm in March. <i>Zigadenus venenosus</i> is not recommended for rangeland planting due to its toxicity. ²
Length of Establishment Phase.	Occurs over 2-4 weeks. ⁴
Active Growth Phase	Place outside and preferably experience the climate conditions, but use the greenhouse at moderate temperatures after initial germination.
Length of Active Growth Phase	2-3 seasons ⁴ . Plants don't grow past the 1-2 true leaf stage during the first season and only senesce in mid-summer, which is needed for survival and not dry out. Sexual maturity can take up to 3 years; however, if a bulb is desired, it will have been formed by the end of the first year. ³
Hardening Phase	It reaches maturity and enters dormancy during early summer as soil moisture declines.
Length of Hardening Phase	Data not available.

Harvesting, Storage, and Shipping	Happens from the plant out in the field, where you can shake the seeds out. They can be harvested from the flowers by cutting them off and shaking seeds into a bag. 130,000 seeds per pound (USDA). ³ No active releases of this plant. Common seed harvested are available in limited quantities.
Length of Storage	2 to 6 months of storage life and recommended to be done in a paper bag at room temperature. ⁴ No exact data on how long between the nursery and out planting.
Guidelines for Out planting / Performance on Typical Sites	32.7 percent survival from a study done in 2005 for meadow death camas. The cover was around 2.4 with the same study. ⁶
Other Comments	Seed production can only be fully completed by insect pollination, but it's difficult due to the plants' high toxicity rate, where it can lead to the death of many bees. ³ Furthermore, this plant is very toxic and has been linked to the deaths of thousands of sheep and livestock. ³ Its bulbs can be confused with wild onions, and if ingested, they can cause severe illness. Consumption of multiple will cause death. ³

VEGETATIVE PROPAGATION DETAILS

Note: There is not a lot of information on the vegetative propagation methods of this species, as a lot of literature suggests it's not the best method to produce due to the already toxic nature of the plant. To gain some idea of how vegetative propagation with bulbs from a Camas, I looked at the Great Camas due to it being in *Zigadenus venenosus*'s previous family of *Lilliaceae* (This is indicated with a *).

Ecotype	
Propagation Goal	Bulbs
Propagation Method	Vegetation is possible by division and bulb offshoots though. ⁷
Product Type	Data not available.
Stock Type	Data not available.
Time to Grow	Data not available.
Target Specifications	Established bulbs to outplant.
Propagule Collection Instructions	Bulbs and plants should not be dug up with plants from the wild. This method should only be used for plants growing in cultivation. ⁴
Propagule Processing/Propagule Characteristics	Data not available.
Pre-Planting Propagule Treatments	Data not available.
Growing Area Preparation / Annual Practices for Perennial	Data not available.
Establishment Phase	Data not available.
Length of Establishment Phase.	Data not available.
Active Growth Phase	Data not available.

Length of Active Growth Phase	Data not available.
Hardening Phase	Data not available.
Length of Hardening Phase	Data not available.
Harvesting, Storage and Shipping	Keep bulbs from completely drying out. Store bulbs in a dry, dark, cool, well-ventilated place in a potting medium such as dry peat moss. ^{8*}
Length of Storage	Data not available.
Guidelines for Outplanting / Performance on Typical Sites	The larger the bulb, the greater the outplanting depth, and it is more likely to survive and establish itself at the new site. ^{8*} Plants require moist soil conditions to establish.
Other Comments	Must be done from plants grown inside the nursery and not a natural site, to harvest the bulb offsets from the meadow death camas. ⁷
INFORMATION SOURCES	
References	See below
Other Sources Consulted	See below
Protocol Author	Kylie Gates
Date Protocol Created or Updated	05/07/25

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