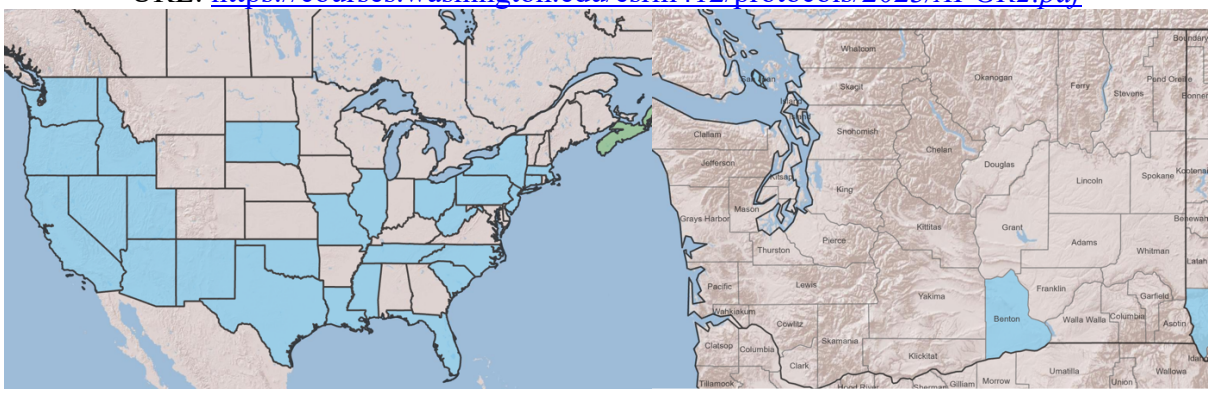
Plant Propagation Protocol for *Apium graveolens*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2023/*APGR2.pdf*



USDA Plants Guide USDA Plant Guide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TAXONOMY	
Plant Family	
Scientific Name	Apiaceae Lindl.
Common Name	Carrot family
Species Scientific Name	
Scientific Name	*Apium graveolens* L.
Varieties	Apium *graveolens* L. var. dulce (Mill.) DC. *Apium graveolens* L. var. rapaceum (Mill.) Gaudin
Sub-species	n/a
Cultivar	n/a
Common Synonym(s)	n/a
Common Name(s)	Wild Celery, celery
Species Code (as per USDA Plants database)	APGR2
GENERAL INFORMATION	

Geographical range	*Apium graveolens* L. occurs in AZ, CA, CT, FL, ID, LA, MA, MS, MO, NV, NJ, NM, NY, NC, OH, OK, OR, PN, SC, SD, TN, TX, UT, WA WV, and Nova Scotia.[1]
Ecological distribution	This species is most commonly cultivated in garden and agricultural settings. It is, however, known to have many environmental requirements. It has a temperature range of which it will tolerate and requires an immense and consistent availability of water. Different sources describe varying preferred temperature ranges but generally this species requires temperate conditions for best growth.[7] Because of these requirements, along with its success in saline conditions, it is prominent in ditches, along rivers, coastal grasslands, and other damp areas near salt water features.[2,5] It is also known as a bog and marsh plant.[3,5]
Climate and elevation range	This species does best in temperate climates with significant water availability. [2,4,7,8] It tends to occur at low to moderate elevations, generally less than 1000 meters above sea level.[7]
Local habitat and abundance	No naturally associated species found, but *Apium graveolens* is said to be good companion plants with leeks, tomatoes, French peas, and brassicas.[2]
Plant strategy type / successional stage	*Apium graveolens* is very tolerant to saline conditions and to light shade.[2,4, 9] It is very intolerant to heat and if exposed to such it is likely to incur damages.[4, 10] It may be able to tolerate light frost but will incur frost damage if exposed to hard or continuous frost.[2,4] This species is shallow rooted and, as such, is very tolerant to and grows best in very wet environments.[11] This species is known to "escape" from cultivated areas and reseed elsewhere where it may naturalize or become an invasive species. [6,12]
Plant characteristics	*Apium graveolens* is a biennial aromatic herb that typically grows to about 1.5 to 3 ft tall if left untouched/unharvested.[2,3,4,5,6,8,9] This species produces small white umbel flowers in its second summer.[2,6,7] The Jepson Herbarium states that flowering occurs from May through July, whereas Plants For A Future states that flowering occurs June through August.[2,7] This species is a cool season crop. [3,11,13]
PROPAGATION DETAILS	
Ecotype	n/a
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	n/a
Time to Grow	Seeds should be sown into trays indoors 10-12 weeks prior to the last spring frost.[4,6] Seedlings should begin to pop-up out of the soil within 2-3 weeks of the sowing date.[4] Seedlings are ready to be transplanted from indoor trays to an outdoor environment after the last spring frost and once they are 6 inches tall.[6]

	Seedings may be expected to grow for about 10-12 weeks before they are ready to be out-planted.
Target Specifications	Seedlings must be at least 6 inches before they are moved outdoors.[6]
Propagule Collection Instructions	Because *Apium graveolens* is biennial, seeds are not produced until its second year. Following the summer flowering in the second year, seeds may be collected from the central stem.
Propagule Processing/Propagule Characteristics	High initial seed density. Sprinkle seeds across surface of tray and cover with layer of media (soil or vermiculite).[4]
Pre-Planting Propagule Treatments	Seed germination is quite slow, taking about 14 to 21 days. Soaking seeds overnight in warm water before planting is suggested to increase germination rate.[4,11]
Growing Area Preparation / Annual Practices for Perennial Crops	*Apium graveolens* requires a lot of moisture and nutrient availability, because of this, it grows best in media with a great amount of organic matter.[11] It is suggested to use seedling trays/flats when growing seedlings from seed. This species does not tolerate cold temperatures so keep growing area above 55 degrees F, and between 60 to 70 degrees F for best results.[4, 6]
Establishment Phase Details	Maintain a consistent and abundant moisture in the trays.[4,6,11]
Length of Establishment Phase	Seed germination can be expected to occur within 14 to 21 days post sowing. [4, 11]
Active Growth Phase	Maintain a consistent and abundant moisture in the trays.[4,6,11] Supplement media with nitrogen and phosphorus fertilizer as needed.[3,4] Once the last spring frost has occurred, the seedlings may be out-planted where they will continue to grow. [6] As described below, blanching practices may begin once out-planted if desired.[3,4,13]
Length of Active Growth Phase	n/a
Hardening Phase	Blanching is a common practice for the agricultural production of this species. This can be done in many ways, one being to cover the stalk with soil as the plant grows, or all at once 2 to 3 weeks prior to harvest.[3,4,13] Many techniques have been developed to blanch this species, all involve covering the stalk or the entire plant to inhibit photosynthesis.
Length of Hardening Phase	n/a
Harvesting, Storage and Shipping	Once the seedlings have reached 6 inches in the trays, they are ready for to be transplanted outdoors.[6] Seedlings should be planted no deeper than their tray depth.[4] No information about how long the seedlings may be stored once removed from try or how they may be transported was found.

	Once the growing season has come to an end at the out-planting site, the stalks and/or the root may be harvested. The plant may also be left to persist and reseed itself. However, seeds may harbor diseases of celery, so to avoid this, only healthy plants should be left to reseed.[2]
Length of Storage	Michigan State University states that *Apium graveolens* seed's may be viable for up to 5 years. [11]
Guidelines for Outplanting / Performance on Typical Sites	In preparation for seedlings, the out-planting site may be supplemented with nitrogen and phosphorus, either from fertilizers, or (preferably) with organic matter. [3,4] The application of organic matter to the soil will also aid in water retention and soil temperature moderation which *Apium graveolens* appreciates.[11] Suggestions regarding out-planted seedling spacing are varying, the Missouri Botanical Garden suggests spacing of about 12-15 inches between seedlings and Michigan State University lists spacing of 6-24 inches.[6,11] Flowering occurs in the summer of the plants second year, if left unharvested.[2,6,7] Out-planting may occur from late spring to early summer, so flowering can be expected to occur about 1 year post planting.[2,6,7]
Other Comments	n/a
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