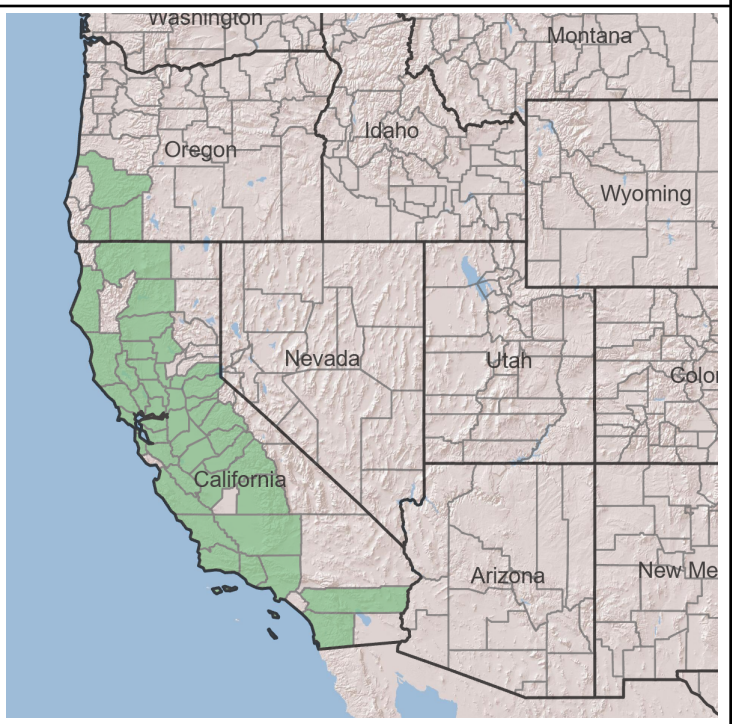
Plant Propagation Protocol for *Achyrachaena mollis*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2022/ACMO2.pdf

TAXONOMY	
Plant Family	
Scientific Name	Asteraceae, Compositae
Common Name	Sunflower, daisy, aster
Species Scientific Name	
Scientific Name	Genus: Achyrachaena Species: A. mollis Species Authority: Johannes Conrad Schauer
Varieties	None
Sub-species	None
Cultivar	None
Common Synonym(s)	None
Common Name(s)	blow wives
Species Code (as per USDA Plants database)	ACMO2 (USDA)
GENERAL INFORMATION	
Geographical range	 (USDA)
Ecological distribution	Plant commonly occurs in low-elevation hills and grasslands (California Native Plant Society). It has also

	been known to occur in savannas and open woodlands (efloras.org).
Climate and elevation range	Preferred climate is one with hot, dry summers and cool, wet winters (Lesser and LaGattuta). Preferred elevation is 0-1220 meters (Baldwin).
Local habitat and abundance	Plant is found in southern Oregon and throughout California. It prefers sunny locations, especially sunny sides of hill slopes (Lesser and LaGattuta), and often occurs with vernal tarweeds belonging to the *Layia* genus (efloras.org).
Plant strategy type / successional stage	Plant is a drought tolerant wildflower (Lesser and LaGattuta). It reproduces by dispersing it's seeds via wind. Unlike most plants, their flowering stage is less impressive than their seeding stage. Their flowers are small and yellow, but the seed fruits take the form of white scales that look like long rectangular flower petals. These scales are easily picked up by wind and dispersed into the surrounding environment (California Native Plant Society). The plant's seeding phase appearance and seed dispersal is similar to that of the common dandelion (*Taraxacum officinale*).
Plant characteristics	Plant is an annual forb/herb (USDA). It grows best in clay soils, but can still survive and grow in other types of soil as long as there is adequate drainage (Lesser and LaGattuta). It blooms in the spring from late March to June (Baldwin). It grows to be about 0.3 meters (1 foot) tall on a strong, straight stem (California Native Plant Society). It has small yellow flowers. It's most distinct and recognizable appearance is when it is in its seeding stage. Its seeds are white and resemble small, thin petals that are arranged in smaller, individual circular structures that are collectively arranged into a spherical shape.  Left to right: flower in bloom, development of seed scales, full fruiting stage (Friends of Edgewood).

PROPAGATION DETAILS Native Plant Network US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources (Barner)	
Ecotype	BLM land, Medford District, upper Table Rock area, Medford, Oregon: 2032 ft. elevation
Propagation Goal	Seeds
Propagation Method	Seed
Product Type	Propagules (seeds, cuttings, poles, etc.)
Stock Type	No information provided.
Time to Grow	0
Target Specifications	No information provided.
Propagule Collection Instructions	No information provided.
Propagule Processing/Propagule Characteristics	Very small lot, 0.057 pounds, hand collected into paper bag.
Pre-Planting Propagule Treatments	CLEANING: Seed lot is first processed using a Westrup Model LA-H laboratory brush machine, with a #40 mantel, at medium speed. Seeds are then air-screened using an office Clipper, with a top screen: 1/18 round and a bottom screen: blank, medium speed, medium air. Number of Seeds per Pound: 141,300 Purity: 99%, X-Ray 100 Seeds: 83% Filled, TZ: 87%
Growing Area Preparation / Annual Practices for Perennial Crops	No information provided.
Establishment Phase Details	No information provided.
Length of Establishment Phase	No information provided.
Active Growth Phase	No information provided.
Length of Active Growth Phase	No information provided.
Hardening Phase	No information provided.
Length of Hardening Phase	No information provided.
Harvesting, Storage and Shipping	Cold storage, 33-38°F
Length of Storage	No information provided.
Guidelines for Outplanting / Performance on Typical Sites	No information provided.
Other Comments	Very small lots present a cleaning and testing challenge, results may not be typical.
PROPAGATION DETAILS Valley Flora Propagation Center Species Profiles CSU Stanislaus (Borders et al.)	
Ecotype	San Joaquin Valley, CA

Propagation Goal	Plants
Propagation Method	Seed
Product Type	Seeds, collected from wild and from nursery
Stock Type	No information provided.
Time to Grow	Ideally, seeds of this species would be planted during October, before the winter monsoonal period of November through March. However, seeds have been planted as late as December. Plant germinates as early as mid-January, and will begin flowering in mid-March. In a year with above average amounts of winter rainfall, A. mollis was observed germinating at the beginning of December, albeit under the protection of floating row cover. In sum: around 2-3 months needed (planted in October, germination in mid-January, then ready for outplanting if desired)
Target Specifications	No information provided.
Propagule Collection Instructions	April and May are peak months for seed collection. Seeds mature continuously over a period of several weeks, so seed collection on multiple dates is ideal. Seeds were collected by shaking the plant or hand stripping them into a collecting bag or envelope. If a significant quantity of seed has been dispersed from the plants before a seed collection visit, it can be collected seed off the ground by hand. This method is not ideal because of potential for contamination with seeds of other species or deterioration in seed quality. But if the seed appears to have fallen recently and has not become damp or mixed with soil and plant litter, a seed collection of reasonable quality can be made.
Propagule Processing/Propagule Characteristics	If seeds have been collected from plants by hand, very little seed processing will be required. Seed lot can be sifted through by hand to remove any large pieces of debris (such as stems, leaves, etc.). When fruits have been collected from the ground, the seed lot has been spread out on a large surface so that soil particles and seeds of other species can be removed by hand. Seeds per gram = 245 (figure derived from a seed lot harvested in 2008 from a wild population)
Pre-Planting Propagule Treatments	Seeds germinate readily without any form of pre-treatment.
Growing Area Preparation / Annual Practices for Perennial Crops	Seeds were hand-sown onto mounded planting beds, and a thin layer of soil was then raked over them. The soils at the nursery are Tranquillity clay with poor drainage. Species was sown in the nursery for four

	years. Workers were able to collect seed during two of those years.
Establishment Phase Details	During the 2004-05 growing season, when precipitation received was above average, the species germinated densely and had good competitive ability against weedy species. During the 2006-07 and 2007-08 growing seasons, when precipitation received was far below average, rabbits browsed the plants heavily and very few of them survived to maturity. However, during spring of 2007 we harvested seed from numerous volunteer plants that were growing within a fenced herbivore exclosure
Length of Establishment Phase	Estimated to be 2-3 months. Planted in October, germination in mid-January.
Active Growth Phase	No information provided.
Length of Active Growth Phase	If planted in October - begins flowering in mid-March, begins producing and shedding seeds in April and May.
Hardening Phase	No information provided.
Length of Hardening Phase	No information provided.
Harvesting, Storage and Shipping	No information provided.
Length of Storage	No information provided.
Guidelines for Outplanting / Performance on Typical Sites	No information provided.
Other Comments	No information provided.
INFORMATION SOURCES	
References	Baldwin, Bruce G. “Achyrachaena Mollis.” *The Jepson Herbarium*, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=703. Barner, Jim. “Achyrachaena Mollis Protocol Information.” *RNGR: Reforestation, Nurseries, and Genetic Resources*, USDA Forest Service , 2009, https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=asteraceae-achyrachaena-3746. Borders, Brianna D, et al. “Achyrachaena Mollis.” *Valley Flora Propagation Center*, CSU Stanislaus, 2010, https://esrp.csustan.edu/vfpc/profiles/ACMO.pdf. California Native Plant Society. “Blow Wives, Achyrachaena Mollis.” *Calscape by the California*

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Other Sources Consulted	Avise, Joan. “ Blow Wives - Achyrachaena Mollis .” *Natural History of Orange County, California* , University of California Irvine , 2010, https://nathistoc.bio.uci.edu/plants/Asteraceae/Achyrachaena%20mollis.htm.
Protocol Author	Jessica Dorety
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