

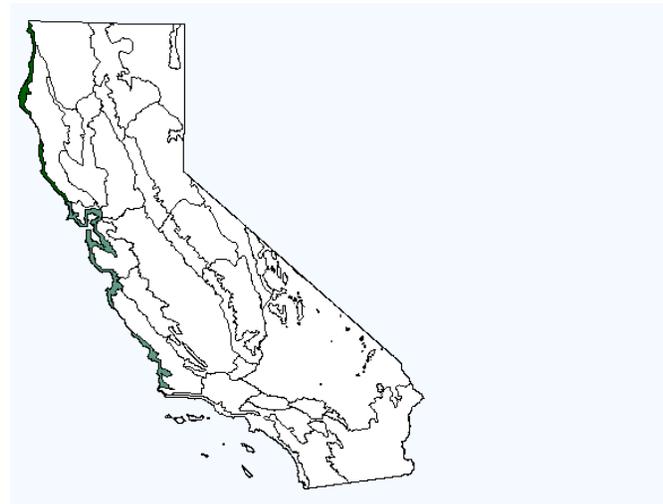
Erysimum menziesii

Taxonomy

Erysimum menziesii, is listed under the Endangered Species Act as federally endangered, and is listed as endangered in the state of California. *Erysimum menziesii* is classified under the Brassicaceae family. *Erysimum menziesii* common name is Menzies' wallflower (JFP). That being said, in 1992 *Erysimum menziesii*, was divided into four subspecies: *E. m. ssp eurekaense* (Humboldt Bay wallflower); *E. m. ssp menziesii* (Also known as Menzies' wallflower); *E. m. ssp yadonii* (Yadon's wallflower), and *E. m. ssp concinnum* (curly wallflower). This grouping of *Erysimum* subspecies is collectively known as Menzies' wallflower (USFWS).

Geographic Distribution

Erysimum menziesii is a North American native. Its range stretches from Southern Oregon to central California. *Erysimum Menziesii* bioregions include the North Coast and Central Coast. It grows at an altitude of 0 to 300 meters above sea level (JFP).



(http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=25136).

Native Habitat

Erysimum is usually found growing on Coastal fore dunes, headlands and cliffs (JFP). On the nearshore dunes and swales *Erysimum menziesii* grows in association with other low growing plants such as beach sagewort, sand-dune bluegrass, dune goldenrod, beach bursage, coast buckwheat, sand verbena, and beach pea. Non-native plants like iceplant, and yellow lupine grow in the same habitat and are problematic for *Erysimum menziesii* establishment (USFWS).

Taxonomic Description

Erysimum menziesii is a biennial or a short lived perennial in its endemic environment (FWS). At its tallest Menzies' wallflower can reach a height of 12 inches and a width of 12 inches. Its leaves are situated in basal rosettes. The leaves are simple, cauline, and the leaf margins are entire to lobed (JFP). Menzies' wallflower generally has fleshy, spoon-shaped leaves. Menzie's Wallflower generally blooms in February to April (FWS). With that being said the Yadon's wallflower blooms from May to June. The flowers are densely clustered racemes. The flower petals are clawed, and generally range in color from yellow to orange; the stigma has 2 lobes (JFP).

Erysimum menziesii is a 'semelparous (monocarpic) perennial'; this means that the plant only flowers and produces fruit one time during its life, after that it will die. However the Yadon's wallflower can actually fruit twice! The Menzies' wallflower forms a rosette of basal leaves and, in some cases can persists in this state for up to eight years; it will then flower, fruit and die (USFWS).

Propagation Methods

This plant does not reproduce asexually in the wild, but reproduces sexually from seed. A single plant produces 15–100 seeds per silique, in 1 or 2 rows. In its native habitat, seeds germinate in the fall or early winter following the first rains. Seeds have a very low survivorship after one year. Therefore, *Erysimum menziesii* usually does not persist in the seed bank (USFWS).

In my propagation experiment there were four seeding treatments. Of these, none of treatments underwent any scarification or cold stratification and each treatment had decent germination. 50 seeds were sown within each treatment. Seeds in treatment one and treatment two were sown in a 288 plug tray with a germination mix. The seeds in treatment two were lightly covered with vermiculite, while the seeds in treatment one were sown directly on the media surface. 50 seeds in both treatment three and treatment four were sown on sand. Treatment four was covered with vermiculite while treatment three was left uncovered, sown on the surface. The trays were then moved to the propagation greenhouse. Day and night temperatures in the propagation greenhouse were 70 degrees. Every 10 minutes, for a 7 second duration, the seeds/seedlings were misted. Supplemental lighting was supplied for 16 hours each day at 150 μmol of light. After a week of being in the mist house, I recorded the amount of seedlings that germinated, and then again at the second week I recorded the amount of seedlings germinated by the second week. It was shown that seeds grown in the 288 trays with germ mix (treatment 1 and 2) had the greatest percentage of germination.

Treatment/Media	4-3	4-10	4-17	Germination %
1: germ mix	Seeds sown	23 germinated; cotyledons present	40/50 germinated; True leaves present	80%
2. germ mix w/ vermiculite	Seeds sown	34 germinated; cotyledons present	38/50 germinated; True leaves present	76%
3. sand	Seeds sown	30 germinated; cotyledons present	34/50 germinated; True leaves present	68%
4. sand w/ vermiculite	Seeds sown	30 germinated; cotyledons present	33/50 germinated; True leaves present	66%

Product Specifications

Menzies' wallflower would work well in rock gardens, especially when grown under similar climatic conditions such as that of coastal California. *Erysimum menziesii* would also work very well in mixed containers in the spring as well. Phenotypic traits, such as a high inflorescence count, many large flowers per inflorescence should be selected for within this species. Unique foliage could also be selected for by breeders (such as higher pubescence or lobed leaves).

Anticipated Cultural Requirements.

Erysimum menziesii can be found growing from zones 9A to 10A. Minimum temperatures in 9A are 20-25 degrees F in the winter months. In 10A minimum temperatures are 30-35. This means zones 9A-10A are recommended planting zones (USDA). Plants are low nutrient feeders, in their natural habitat they grow in beach dunes comprised primarily of sand. Humboldt wallflower is susceptible to a fungus that affects reproduction (USFWS).

Production Schedule

I was unable to find any production guidelines concerning *Erysimum menziesii*. However, I will give recommendations based on schedules for *Erysimum* species already on the market, such as Plug Connections *Erysimum* Series. Cooler weather and Short Days will initiate flowering. Begin by bulking *Erysimum menziesii* with temperatures at 65-70 degrees vegetatively, transplant seedlings into four inch pots for 6-8 weeks. Once plants reach 50 % of optimum size vernalize. *Erysimum* should receive 4-6 weeks of cool vernalization. Temperatures for vernalization should be 35-50 degrees F. Avoid overwatering, allow for media to dry out between waterings. High light levels are

recommended. In northern climates it should take growers six months to grow out their product. In MN, the target sales date is early May, this is because this is around the time the last day of frost occurs and consumers want to buy something that is in bloom. PGRs, such as 5ppm of "Sumagic" may be used as needed (Plug Connections). Ball Seed Company recommends 10ppm of Bonzi, three weeks after seeding, in order to keep plants 'compact/stretch-free'. For fertilization regimes Ball Seed recommends fertilizing seeds twice a week with a 50ppm N solution, and then after initial transplant begin fertilizing 100ppm of N until finishing (BSC).

Needs Assessment for Genetic Improvement.

There is a potential for Menzies' wallflower to be developed as a bedding plant, that is if growers quicken the juvenile stage. Also breeders may be able cross Menzies' with other *Erysimum* species in order to breed for cold hardiness, perennialism, or even annualism. If the grower is able to bypass vernalization through breeding, that would shorten production cycles and save money. Breeding for uniformity would also be important because phenotypic variation within this species is high.

Works Cited

- Ball Seed Company. "Grower Facts: Erysimum Citrona™." <http://www.ballseed.com/Growers/plant_info.aspx?phid=025604527003789>
- Jepson Floral Project. "Treatment From The Jepson Manual: Brassicaceae." The Jepson Herbarium. 1993. 29 April 2014 <http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?2240,2463,2476,2480> <http://ucjeps.berkeley.edu/cgi-bin/get_JM.pl?tid=25136>
- Las Pilitas Nursery. "*Erysimum menziesii*." 28 July 2013. 29 April 2014. <<http://www.laspilitas.com/nature-of-california/plants/erysimum-menziesii>>
- Plug Connection. "Erysimum GLOW Series: Perennial Wallflower". 29 April 2014. <<http://www.plugconnection.com/documents/ErysimumCulture.pdf>>
- United States Department of Agriculture. "Plant Hardiness Zone Map". 2012. 29 April 2014. <<http://planthardiness.ars.usda.gov/PHZMWeb/Default.aspx>>
- U.S. Fish & Wildlife Service. "Menzies' Wallflower: *Erysimum menziesii*." 8 August 2013. <<http://www.fws.gov/arcata/es/plants/menziesWallflower/menzie.html>>
- U.S Fish & Wildlife Service. *Menzies' Wallflower (Erysimum menziesii) 5-Year Review: Summary and Evaluation*. Arcata, California. June 2008.