

Chorizanthe douglasii - New Crop Summary & Recommendations

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Investigation into the Potential of Breeding Chorizanthe douglasii for the Commercial Flower Market, Ann Putnam

Taxonomy

The name *Chorizanthe* comes from the Greek “chorizo,” to divide and “anthos,” flower. *Chorizanthe douglasii* is a member of the Polygonaceae family, genus *Chorizanthe* r. *Br. Benth*, species *douglasii benth*. It is commonly known as Douglas Spineflower. Its classification has been changed several times since it was first identified in the early 1800’s by a Scottish collector for the Royal Horticultural Society. Bentham suggested the classification in 1836. In 1913 Jepson classified it as *C. nortonii* but in 1934, George Goodman at the Missouri Botanical Garden placed it in *C. douglasii*. (Reveal. 1989.)

Geographic Distribution

There are 40 species found in North America and of those 33 are found in California. Distribution of *C. douglasii* is at 35-36° N in coastal California at an elevation of 55 to 1600 meters. The California Native Plant Society (CNPS. 2012.) locates the species in Monterey, San Benito and San Luis Obispo counties.

Native Habitat

Moderate temperatures characterize the Mediterranean climate in this area with wet but not cold winters, and dry summers. The plant is an annual, germinating in the winter and blooms from April to July. The U.S. plant hardiness zone is 9b. An average temperature range in coastal California in January is 6 - 15° C and in July it is 11 - 20° C. An average 1.48 inches of rainfall in April diminishes to .09 inches in July. The plant grows on gravelly or sandy slopes in serpentine soil. It has been found in a range of habitats from coastal scrub to the foothills of woods and pine forests.

As no cultivation information could be found in the literature, the climate and soil information was used to create the production schedule.

Taxonomic Description

The plant is 10-50 cm tall and generally soft and hairy. The leaves are basal, 5-40 mm long. A whorl of cauline leaves usually is found mid stem. There are six bracts (three are larger) with an involucre of 3-5 mm that is hairy and cylindrical. The margins of the membrane are purple and the bract awns are hooked. The flower is white to rose colored. It has a perianth 3.5 to 4.5 mm in length, and “has lobes with a minute tooth or shallow notch.” (Jepson. 1993.)

The plant blooms from April to July. No references were found to any uses, including by indigenous people. There are no cultivars on the market although a few native plant distributors, primarily in California, sell the plant’s seed.

Propagation Methods

The plant is propagated by seed through aerial and mechanical dispersion. In the latter mode as the seed is contained in the involucre on which the hooked awns can attach to animals passing by (Baron. 2005.). There is one seed per flower. There was no reference to seed dormancy in the literature and based on observations arising from lab experiments dormancy is unlikely. One reference in the literature indicated the seed germinated in the winter but no temperature range was cited. Two sources, the seed distributor and an academician at University of California, Berkeley, communicated that the seed was easy to grow. This observation was not the case in the lab experiments but this may be due to viability of the particular seed lot used.

Product Specifications

The ideal phenotype would be a cultivar with a bright pink florescence that is compact and erect in the height range of the existing species or taller. The specimen in the lab experiment is a pale pink but the target goal would be the bright pink seen in photos on *Calflora* (Calflora. 2012.)

Market Niche

The targeted sales date would be spring and early summer with promotions preceding Earth Day. The species might be forced, however, given it's current color it aligns with the spring-summer palette and not with the autumn or winter palette. If a deeper rose or purple tone could be bred then it might be marketed year round.

This plant offers a unique story that is timely, and symbolizes the essence of sustainability, a concept that is in front of consumers on a daily basis. Certain species of the genus have been identified as endangered and are cited in environmental impact statements. (Ertter. 1996.) Native plant enthusiasts, particularly in California, already know about the threat to native species caused by development and introduction of invasive flowers and weeds. Environmentalism is important in California. An example, is a color folio book published by the California Department of Fish and Game, *California Wild Garden, A Living Legacy*. (Faber. 1997.). There are several references and photos of the genus *Chorizanthe*. At least one of the California species is extinct *C. parryi* var. *fernandina*. Another species, *C. robusta* var. *robusta* is on the endangered species list. The California Native Plant Society has classified *C. Douglasii* as "uncommon" (CNPS. 2012).

There are already some plant distributors selling only native species because of consumer interest in preserving the natural ecology and using plant material that requires less water. *Chorizanthe douglasii* can appeal to the native plant enthusiasts as a way to "save" an endangered species and to the consumer as a way to "save" water because it appears to grow in marginal soil with minimal rainfall. The marketing slogan, not only for *C. douglasii*, but also, for an entire line of "Sustainable" plants could be "SAVE ME... save water."

Anticipated Cultural Requirements

The plant's USDA winter hardiness zone is 9b. According to the USDA Heat Zone map, *C douglasii* is in Zone 3, which means the average number of days above 30° C is less than seven. There are no anticipated light requirements other than average daytime light quality and quantity. Although data is insufficient to draw a conclusion, no photoperiod response was observed during the 10-day period when the plants were placed on the short day bench. The seed would need to be detailed. Handling the seed was awkward because it had not been separated from the involucre.

The plant's native soil is serpentine which could be interpreted to be sensitive to the presence of certain minerals. Based on some general observations during the experiment the plant preferred a low peat soil mix, Sunshine MVP™, with the addition of calcine clay. Further trials will show whether plant growth regulators would be beneficial. The plants grown in the experiment were not erect as was anticipated from flora manual descriptions, however, this may be attributed to the greenhouse growing conditions where the plant received more water than it would in its normal habitat. As to insect resistance, the plant did not appear to attract thrips or aphids despite an abundance of those insects on other adjacent species. There was no obvious sign of disease although possibly the plant's limpness was caused by an asymptomatic disease.

Seed viability was tested with both a rag doll test and TTC. The viability results were very similar each having only 3% seeds with a live embryo (TTC). A total of 72 seeds were tested in two sets of media and stratification trials. Of those two trials a total of 12 seeds germinated and survived to flowering. There was no significant difference in either height or number of flowers between the seeds placed in cold stratification for two weeks and those placed directly in the mist house. Given the plant's climate this might have been expected. The initial soil test indicated the plant would not thrive in either a sandy, clay soil or a high peat content soil (LC8.) The plants did respond well to a growing media of MVP with calcine clay added.

A production schedule for further testing is presented below.

Production Schedule

Week	Proposed	Reason
Week 9	Plant in short 128 plug trays. Germinate in light peat media, such as Sunshine MVP. Cover lightly with vermiculite. Place in mist house and observe.	The experimental treatments with the lighter mixture went on to produce shoots and flower. Seeds placed in heavier peat and sand/clay germinated but did not survive.
Week 10	Leave in mist house.	The plant's habitat has wet

		winters so water is likely important to germination although as proven by experimental treatment stratification is not.
Week 11	Remove to cap mats.	The plant had a set of leaves which both looked like true leaves rather than cotyledons.
Week 12	Leave on cap mat.	The shoot grew slowly and a bud on one plant appeared before the plant had grown more than a few cm's.
Week 13	Transplant to a 4" pots and move off cap mat. At this point in the experiment create three control groups. Control One: to compare the effect of less fertilizer. Try 75-100 ppm NCLF instead of 125. The second control group should continue to receive 125 ppm but only once a day. The third should use a PGR in diluted strength.	Control One: the plant grows on serpentine soil, which has clay so it may prefer higher pH. The N may be making the soil too acidic. Control Two: Although it is the wet season the plant may be receiving too much water on a daily basis relative to its normal habitat. Control Three: Although the plant reached the expected height it did not have a sturdy stem.
Week 14	Observe the shoot growth and bud formation to determine the optimal treatment.	The plants in the experiment did have on average 26 flowers. The highest count on one plant was 46. Flowering is not an issue.
Week 15	Leave under long days.	Plants did not respond any differently to 10 short days.
Week 16	Continue observations.	
Week 17 Earth Day	Plants range from 10 to 17 cm and had numerous buds and flowers.	Not ready for Earth Day 2013 yet but might still be a good bedding or even cut flower candidate if stem sturdiness can be achieved. Possible crosses with other species to obtain a brighter pink.

Literature Cited

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