

# New Crop



## *Elymus californicus*

California Bottlebrush Grass

Jessica Jeney

Image source: <http://www.coastalzone-ca.com/photoalbum.htm>

# Taxonomy

- Scientific name: *Elymus Californicus*
- Synonyms: *Leymus californicus*, *Hystrix californicus*
- Common name: California Bottlebrush Grass
- Family: Grasses - Poaceae

# Geographic Distribution

- Continent: North America
- Country: United States
- State: California
- Latitude: 48 N
- Altitude: 15-470 meters
- General Climactic Conditions: Zone 5 hardy, drought tolerant, prefers dry shade in woodland or riparian setting.
- Tendency to naturalize or become invasive: No tendency for invasiveness found; this plant is native and endemic to California.

California Floristic Province

- North Coast
- Outer North Coast Ranges
- Central Coast
- San Francisco Bay Area

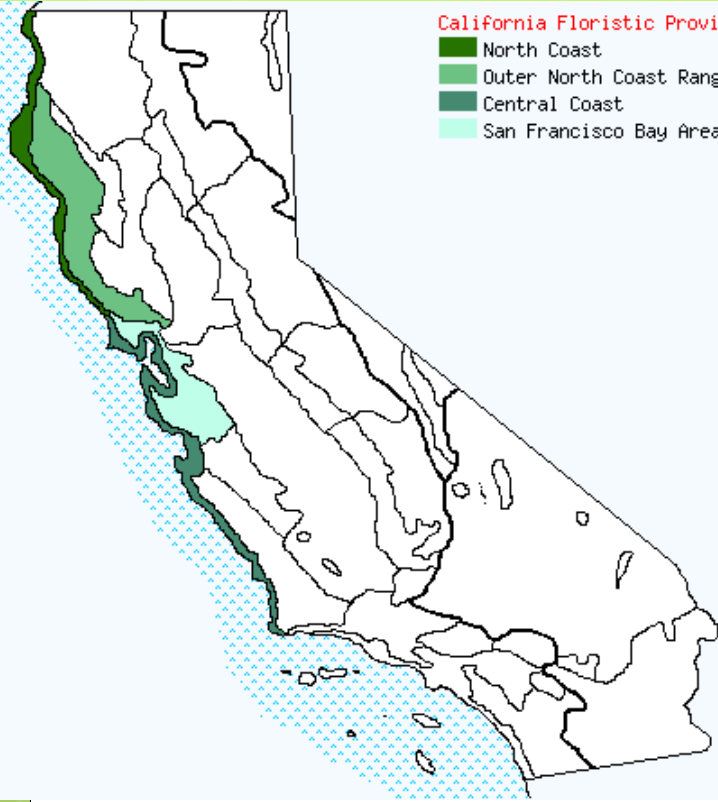


Image sources: [http://ucjeps.berkeley.edu/cgi-bin/get\\_JM\\_treatment.pl?8738,8964,8966](http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?8738,8964,8966) and <http://plants.usda.gov/core/profile?symbol=ELCA10>



# Native Habitat

- Habitat: Native and endemic to California; included on CNPS Inventory of Rare and Endangered Plants on list 4.3 for limited distribution. Riparian habitat. North Coast, Outer North Coast Ranges, n Central Coast, San Francisco Bay Area (Santa Cruz Mountains). This is a grass that prefers woodland and understory regions, thriving in dappled shade to some shade.
- Plant Communities: North Coastal Coniferous Forest, Closed-cone Pine Forest, Redwood Forest, Douglas-Fir Forest, Mixed Evergreen Forest, Foothill woodland



# Taxonomic Description

- Overall Plant Habit/ Description: Classified as a monocot perennial herb, *Elymus californicus* is a wild rye species with an upright grass with growth potential ranging from 1-2 meters in height with a nearly naked stem that occasionally bears sheathing leaves with 10-20cm blades. Gramenoid growth habit; spreads slightly from base.
- Root System Type: Fibrous, rhizominous
- Presence/Type of Underground Storage Organs: None
- Leaves: stiff basal sheath hairs, slender; blade 10-20mm wide and flat.
- Flower: inflorescence, 10-25cm, erect, curves with increased grain weight; internodes 7-12mm; spikelet 12-15mm; awn +/- 20mm.
- Season of Bloom: Summer
- Use(s) by indigenous people: None recorded.
- Other uses: Native plantings for shaded areas.
- Additional Items of potential Interest: Noted as deer resistant

Image sources:

[http://calphotos.berkeley.edu/images/128x192/0000\\_0000/0508/2314.jpeg](http://calphotos.berkeley.edu/images/128x192/0000_0000/0508/2314.jpeg),

[http://plants.usda.gov/gallery/standard/hyca8\\_001\\_svd.jpg](http://plants.usda.gov/gallery/standard/hyca8_001_svd.jpg),

[http://calphotos.berkeley.edu/images/128x192/0000\\_0000/0702/0276.jpeg](http://calphotos.berkeley.edu/images/128x192/0000_0000/0702/0276.jpeg),

<http://www.baynatives.com/plants/Elymus-californicus/PBF3731.jpg>





# Propagation Method

- Propagation by seed
- Seeds sown shallowly in germination mix
- Minimum temperature of 20 Degrees Celsius to ensure germination
- No PGRs recommended
- Erratic germination

# Product Specifications

- An ideal *E.californicus* would be of even height within the 1-2 meter range across progeny, maintain an erect form, and be shade and drought tolerant. The cultivar with possess an even coloration as well as a full and attractive inflorescence that arches with grain weight without bending and breaking the spike.

# Market Niche

- Target sales date(s): Currently offered on websites and in California garden centers. Spring through summer ideal for sales
- Potential holiday(s) for this product: None specific, possibility to market for Earth Day.
- Programmability: Can be forced indoors, germination is poor though.
- Crop competitors: Grasses and ferns probable competitors. Similar habits, capabilities in landscape.
- Story: Market as a unique native that is rare but hardy; bring yourself closer to California nature and the Redwood forests.
- Limitations: Currently germinates very irregularly; may be limited by preferred habitat.
- Identifiability: Already marketed in California, a “bottlebrush” grass, no marketed cultivars
- Availability: available online and in garden centers in California; more regular cultivars may take upwards of 5-10 years to select for lines, if not longer.



# CNPS

California Native Plant Society



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Join and support the organization that has championed native plants and habitats for over forty years. Bay area chapters of CNPS offer field trips, plant sales, classes, workshops, garden tours, and more.

Image sources:

<http://www.cnps.org/cnps/images/chapters/bayarea/map2010.jpg>,

<http://blog.ereach.com/cincinnati/files/2014/04/earth-day.jpg>,

<http://www.hastingsreserve.org/nativegrass/GrasManagePics/Deschampsia-cesp-plant.jpg>,

[http://mamba.bio.uci.edu/~pjbyrant/biodiv/plants/Ferns/DSC\\_9361b.jpg](http://mamba.bio.uci.edu/~pjbyrant/biodiv/plants/Ferns/DSC_9361b.jpg)



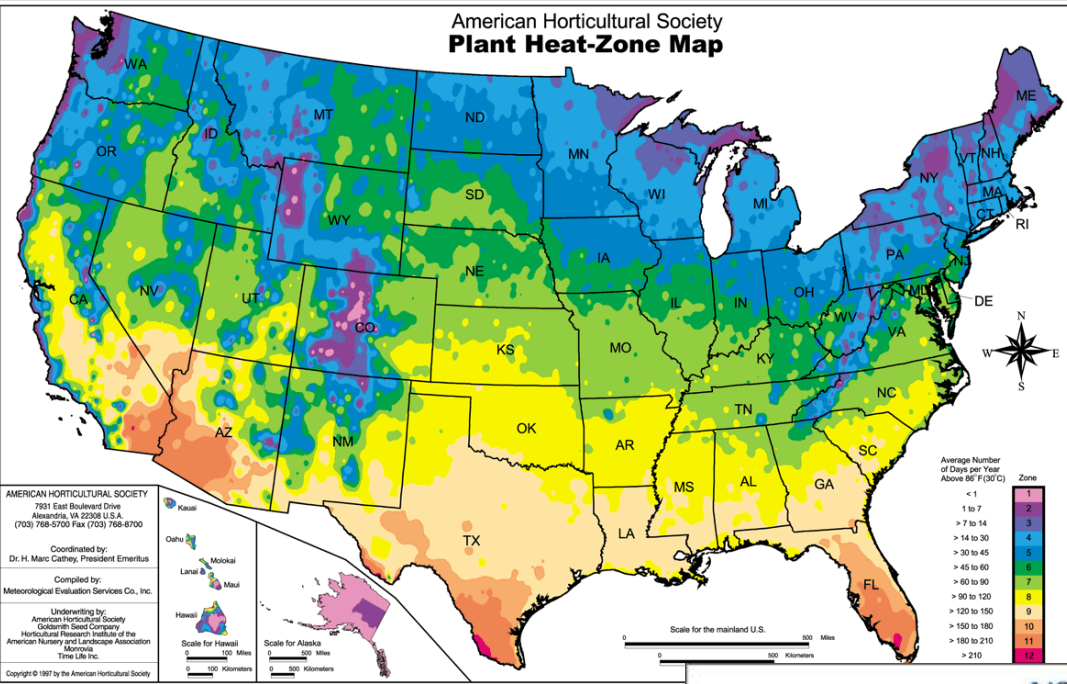
# Earth Day

April 22

# Anticipated Cultural Requirements

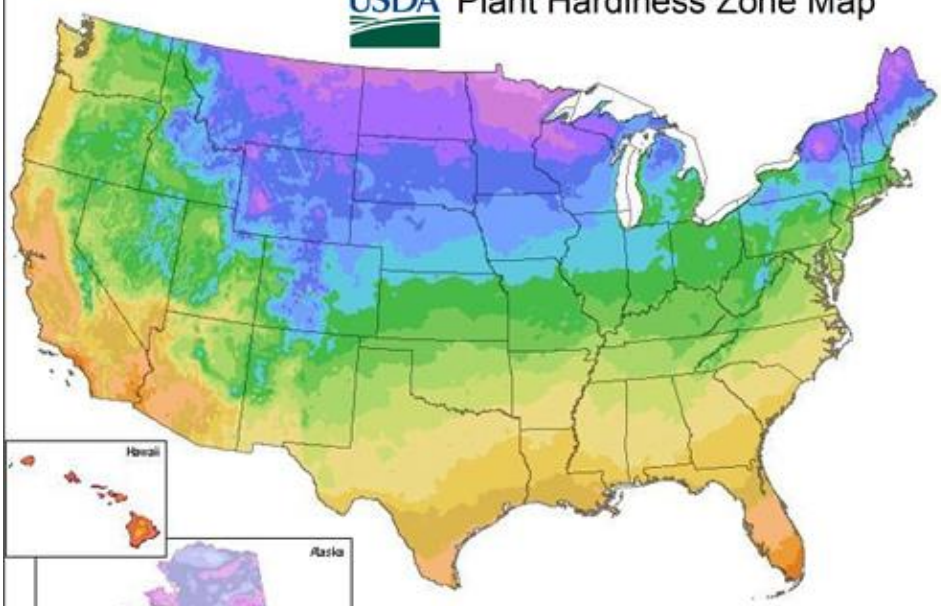
- Winter Hardiness: zone 5 hardy
- Heat/Drought Tolerance: inhabits areas up to zone 6 heat zone
- Temperature: Exists in areas where the highest temperature is 22 degrees Celsius on average, and the lowest is 8 degrees Celsius.
- Light quantity, quality, duration; photoperiod response: Prefer shade/ dappled shade for majority of day. May be long day responsive based on location and bloom time.
- Soil: Exists in old, rich, well drained forest soils that are neutral to slightly acidic. Well drained media and soils that are nutrient rich may be best for production.
- Container size: start in 288 plug tray, move up to 4" pots, finish in 1 or 2 gallon containers.
- Other: Deer resistant, can be planted in troublesome areas.

# American Horticultural Society Plant Heat-Zone Map



Reproduced with permission of the American Horticultural Society (www.ahs.org)

# USDA Plant Hardiness Zone Map



OSU  
Agricultural Research Service  
Oregon State University

Mapping by the  
PRISM Climate Group,  
Oregon State University,  
<http://prism.oregonstate.edu>, 2012

# Production schedule

- Week 9: Seeds sown into 288 plug trays and move into mist house for germination. Seeds sown shallowly.
- Week 14: Moved seedlings from mist house to cap mat to encourage root growth.
- Week 16: Transplanted seedlings to 4" pots.
- Out of 60 seeds sown, only 5 germinated.
- No PGRs are known to be used in the propagation of *Elymus californicus* and thus have not been used in this production schedule.
- It was found in passing mention that the awn of each seed should have been removed for improved germination.



## Elymus californicus

Week 10 of growth from seed sowing date.

Ideal to start production for target week 20 at a much earlier date if intending to sell in 1 or 2 gallon containers.

Perhaps as early as week 40 the previous year to ensure growth.



# Needs Assessment for Genetic Improvement

- This species needs work in terms of germination rates for it to be profitable. *Elymus californicus* could benefit from breeding programs that focus on germination, and perhaps research into crossing it with another wild rye type could help bolster that.

# Works Cited

- <http://b-and-t-world-seeds.com/cartall.asp?species=Elymus%20californicus&sref=78707>
- <http://books.google.com/books?id=nGocHgeBwVMC&pg=PA354&lpg=PA354&dq=elymus+californicus&source=bl&ots=pTCrYos3pl&sig=elSmCul8F6yapr-2ykZlJXFPvsw&hl=en&sa=X&ei=zMNeU-rnGtOgyASD-4GIBg&ved=0CJsBE0gBMBl#v=onepage&q=elymus%20californicus&f=false>
- <http://www.calfloranursery.com/plants/elymus-californicus>
- <http://plants.usda.gov/core/profile?symbol=ELCA10>
- [http://www.calflora.org/cgi-bin/species\\_query.cgi?where-calrecnum=2929](http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=2929)
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- [http://en.wikipedia.org/wiki/Elymus\\_californicus](http://en.wikipedia.org/wiki/Elymus_californicus)