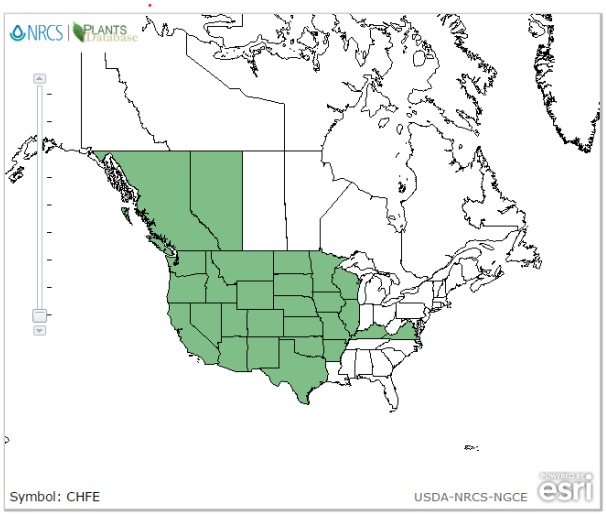
Plant Propagation Protocol for *Cheilanthes feei*
ESRM 412 – Native Plant Production

Protocol URL: https://courses.washington.edu/esrm412/protocols/*CHFE.pdf*

TAXONOMY	
Plant Family	
Scientific Name	Pteridaceae
Common Name	Fern Family
Scientific Name	
Species Scientific Name	*Cheilanthes feei* T. Moore (10)
Varieties	None
Sub-species	None
Cultivar	None
Common Synonym(s)	None
Common Name(s)	Slender lipfern (10/4) Fee's Lip Fern (11)
Species Code (as per USDA Plants Database	CHFE



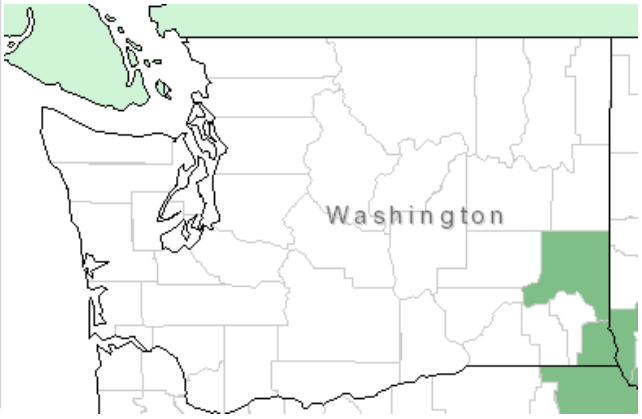


Image 1 (above left): Distribution of *C. feei* in North America – USDA
Image 2 (above right): Distribution of *C. feei* in Washington State – USDA

GENERAL INFORMATION	
Geographical Range	This species is native to North America. (4) In the United States, it is present in most states West of Illinois, as well as Kentucky and Virginia and in Canada is present in British Columbia and Alberta. (10)
Ecological Distribution	Very Hardy: Zones 4 - 6. (12) Grows under high-light in moist-dry to dry, basic, well-drained garden soil with sand, and grows in limestone cliffs. (4) This species does not tolerate moist conditions. (9) Species prefers drier screes and rocky terrain that offer arid conditions. (7)
Climate and Elevation Range	In Washington State it can be found at elevations from 260-800 m in arid climates. (11)
Local Habitat and Abundance	Rare in the Pacific Northwest. (6) In Washington State, this species can be found in Asotin and Whitman County. (10)
Plant strategy type / Successional Stage	Mid to Late Successional
Plant Characteristics	Life form: Forb/Herb. (10) A small fern with compact to short-creeping rhizomes and small rosette clusters of blue-green fronds, with distinctly finely divided blades. (4) Fronds are bipinnate and covered with long, whitish hairs, especially on the underside. (12) Spores can be up to 92 um, and have reduced numbers, suggesting they are apogamous. (5) Lacy fronds arise from a compact rhizome, and can grow to 6" in length. (7) Fronds are lightly tufted, with nearly round pinnule lobes and the pinnules of the lower pinnae are fully cut to the midrib. (1)

Image 3 (left): *C. feei* - http://newmexicoflores.com/Cheilanthes_feei2.jpg

Image 4: *C. feei* underside - http://wisflora.herbarium.wisc.edu/spec_images/bigphoto/CHEFEE_NOLL.jpg

PROPAGATION DETAILS	
Propagation Goal:	Plants and Spores
Propagation Method	In general, for the genus *Cheilanthes*, propagation is easy from spores, and moderately difficult by division. (2/9)
Product Type:	For *C. feei* and *Cheilanthes lanosa:* Shallow containers: saucers, petri dish
Stock Type	For *C. feei* and *Cheilanthes lanosa:* Shallow containers: saucers, petri dish
Time to Grow	Adults grow slowly, especially when competing with other species. (3)
Target Specifications	2-4 inches in height, and 4 inches in width. (2)
Propagule Collection Instructions	Spores can be collected without permanent damage to the plant, and should be harvested in November and December by clipping a frond bearing spores. (3)
Propagule Processing/Propagule Characteristics	Unknown
Pre-Planting Propagule Treatments	Store in a glass container at 4° C in the dark with some ventilation so the spores dry. After a few months they are ready for harvest. (3)
Growing Area Preparation / Annual Practices for Perennial Crops	Using a shallow container such as a Petri dish bottom, saucer, etc., pack clean fine sand. (3)
Establishment Phase Details	Saturate the spore material with a liquid growth medium or fertilizer, containing high calcium and low in nitrogen. Next, gently squirt the spore material in a spiral pattern over the sand, and moisten the sand by squirting growth medium around the outer edge of the sand. Cover the cultures with aluminum foil and incubate at 25-30° C for 1-1.5 weeks. Next, remove the cover and place the cultures near indirect light, covered with glass, but allowing airflow. (3)
Length of Establishment Phase	Spores will germinate in the dark in 10 days if stored for 2-3 months, but if stored longer may need up to 1.5 weeks in the dark, followed by 1.5 weeks in heavy shade, and then 1.5 weeks in continuous indirect white light. (3)
Active Growth Phase	The plants will dry very slowly and watering is crucial. The sand must remain moist but feel dry to the touch so it will not clump. (3)
Length of Active Growth Phase	4-6 weeks (3)
Hardening Phase	Unknown
Length of Hardening Phase	Unknown
Harvesting, Storage and Shipping	When the fronds are dried, remove from storage and crush them with a mortar and pestle. Follow by filtering out stems and hairs. (3)

Length of Storage	Spores can be stored for a few months. 2-3 months is ideal, anything more will require longer germination time. (3)
Guidelines for Outplanting / Performance on Typical Sites	Soil must be well-drained and plant should we water indirectly, around the edges of the plant. Watering directly can damage or kill the plant. (3)
Other Comments	Nearly 75% of apogamous ferns contain 3 sets of chromosomes in their cells instead of the normal two, this species is triploid, containing 3 sets of chromosomes. (8)

INFORMATION SOURCES

References

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