

Fern Propagation

Created and Presented by
Shawn Jalbert
May 15, 2018



Fern spores vs. seeds

Ferns are distinct among plants because of the way they reproduce-by spores instead of seeds.

Spores essentially perform the same function as a seed-a means to reproduce and perpetuate the species.

The fern life cycle has a number of significant differences compared to flowering plants that we will talk about.

As we have seen, seeds have evolved a complex system of dormancy and dormancy breaking requirements involving cold and warm cycles and various seed treatments. Fern spores from different species do not have these complex requirements. Generally speaking, spores from mostly all ferns have the same basic requirements to grow-moisture, warmth, and light.



Maidenhair spleenwort,
Asplenium trichomanes

Growing Ferns from Rhizome Fragments

Propagation options....rhizome division.

Many species of ferns can be propagated by using rhizome divisions.
The adventitious nature of colony forming species naturally lend themselves to this method.



Hay-scented fern, *Dennstaedtia punctilobula*

Hay scented fern is a rugged species that can cover large expanses of dry, well lighted areas; atypical of what we usually associate with fern habitat.

The spreading root system of this fern is segmented and can be easily broken apart, making for quick and easy propagation.

Ease of propagation makes this a common species in the trade.

Propagation options...rhizome division.



Polypody fern (*Polypodium virginianum*) grows remarkably well on glacial erratics, where it survives on shallow pockets of accumulated organic matter.



Polypody fern rhizomes are about the diameter of a pencil; natural constrictions on the roots allow for fragments to be broken off and grown.

Propagation options...rhizome division.

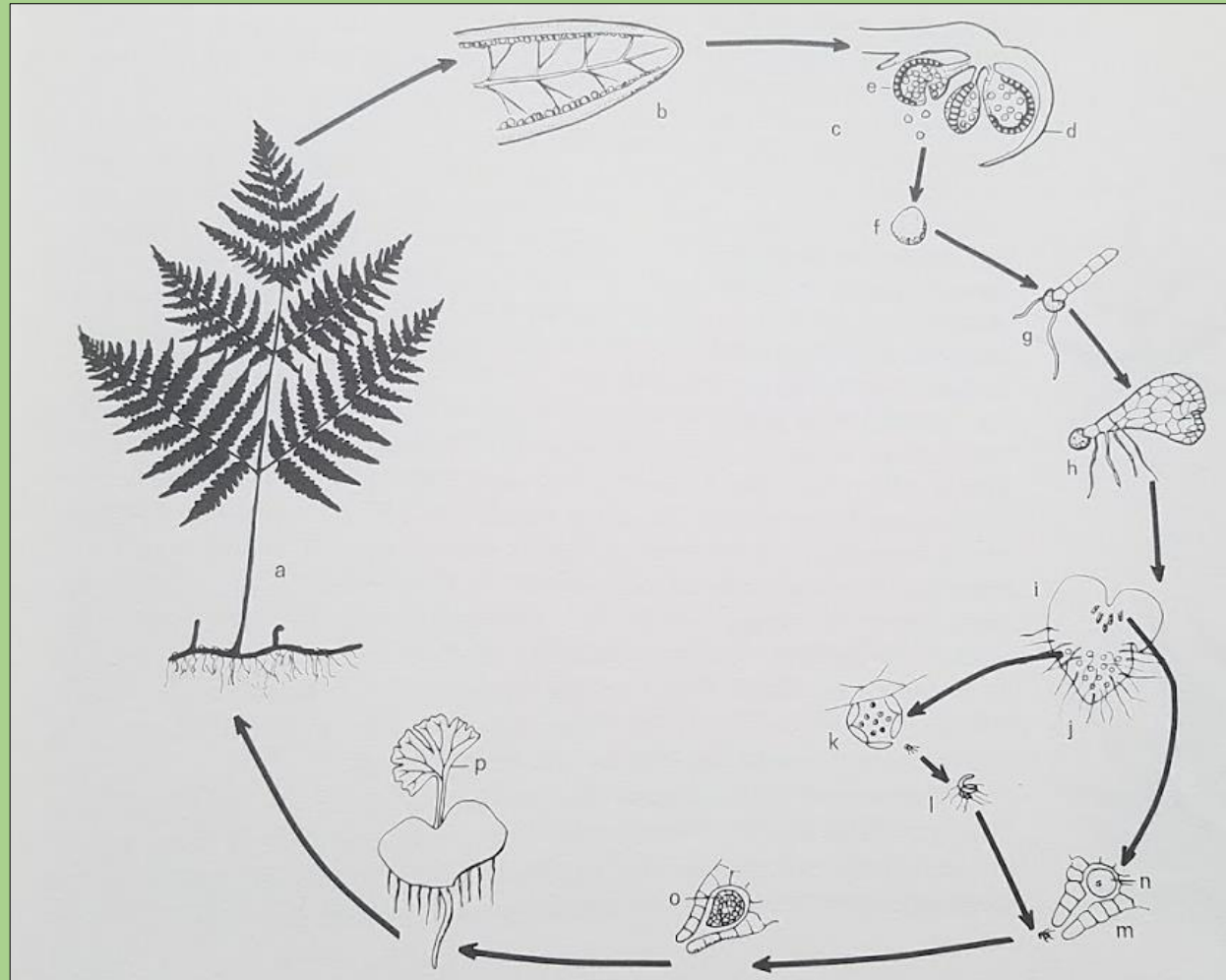


Sensitive fern, *Onoclea sensibilis*

Sensitive fern can form dense extensive patches in moist to soggy soils.
It can be easily propagated using rhizome fragments.

The Fern Life Cycle

Understanding the fern life cycle.

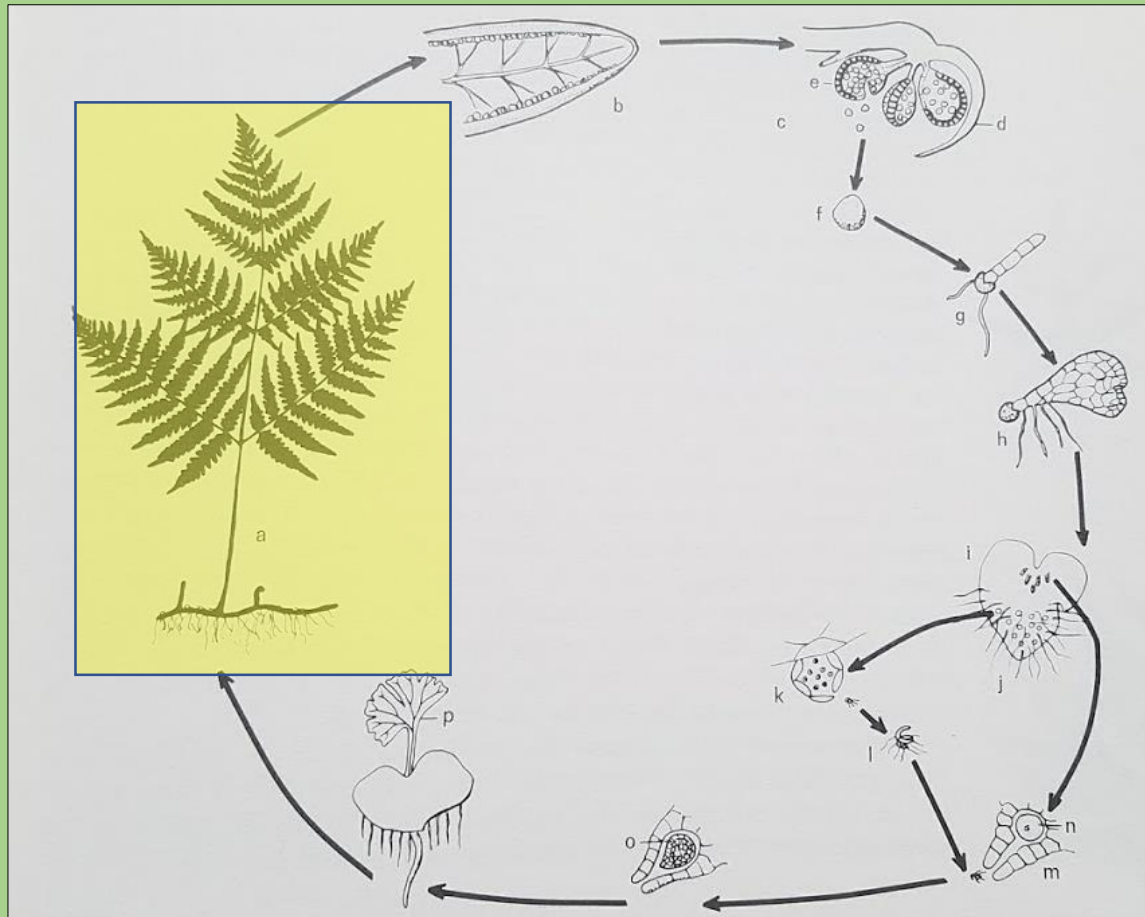


A basic understanding of the fern life cycle is very helpful for interpreting what is going as your ferns start to grow.

It is a bit like a road map; you can see where you are and where you can expect to go.

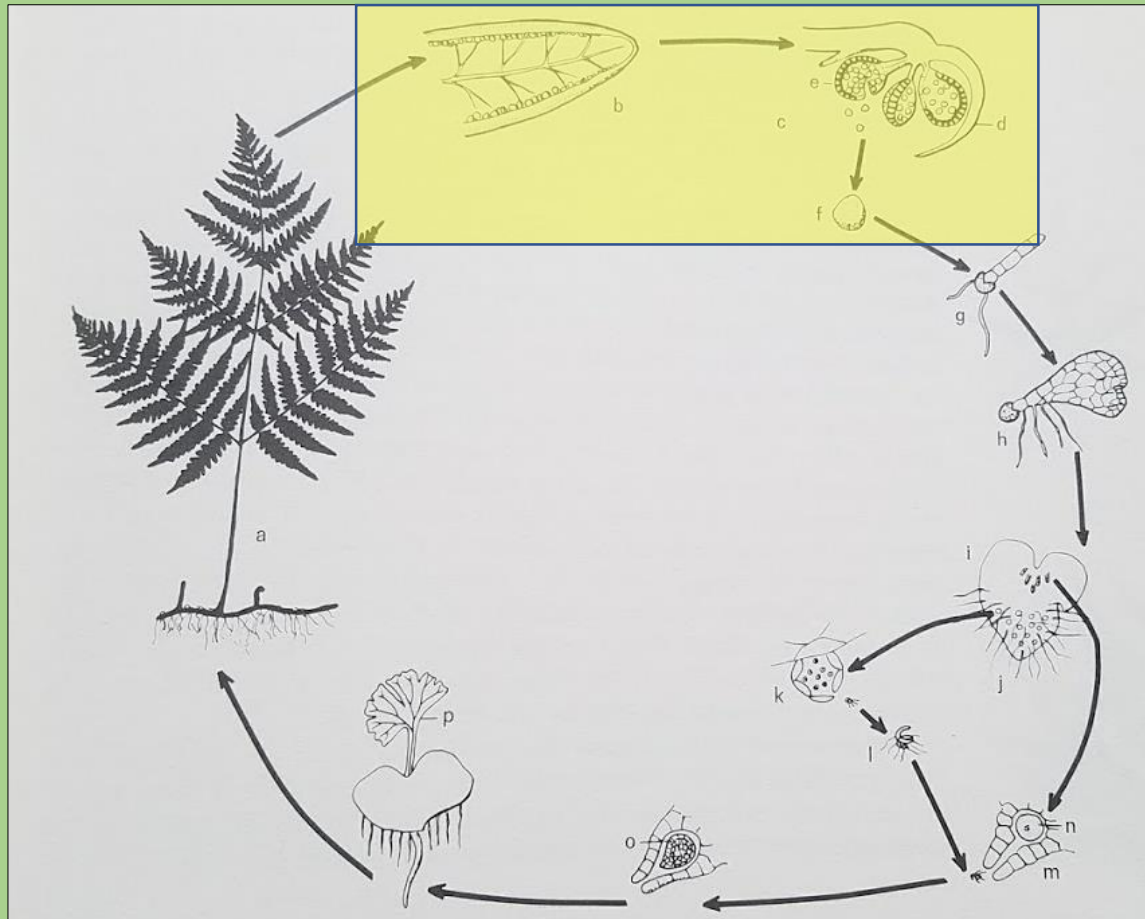
An interesting part of fern biology is the “alternation of generations”; where the plant looks radically different depending on what part of the life cycle it is at.

Fern life cycle-sporophyte stage.



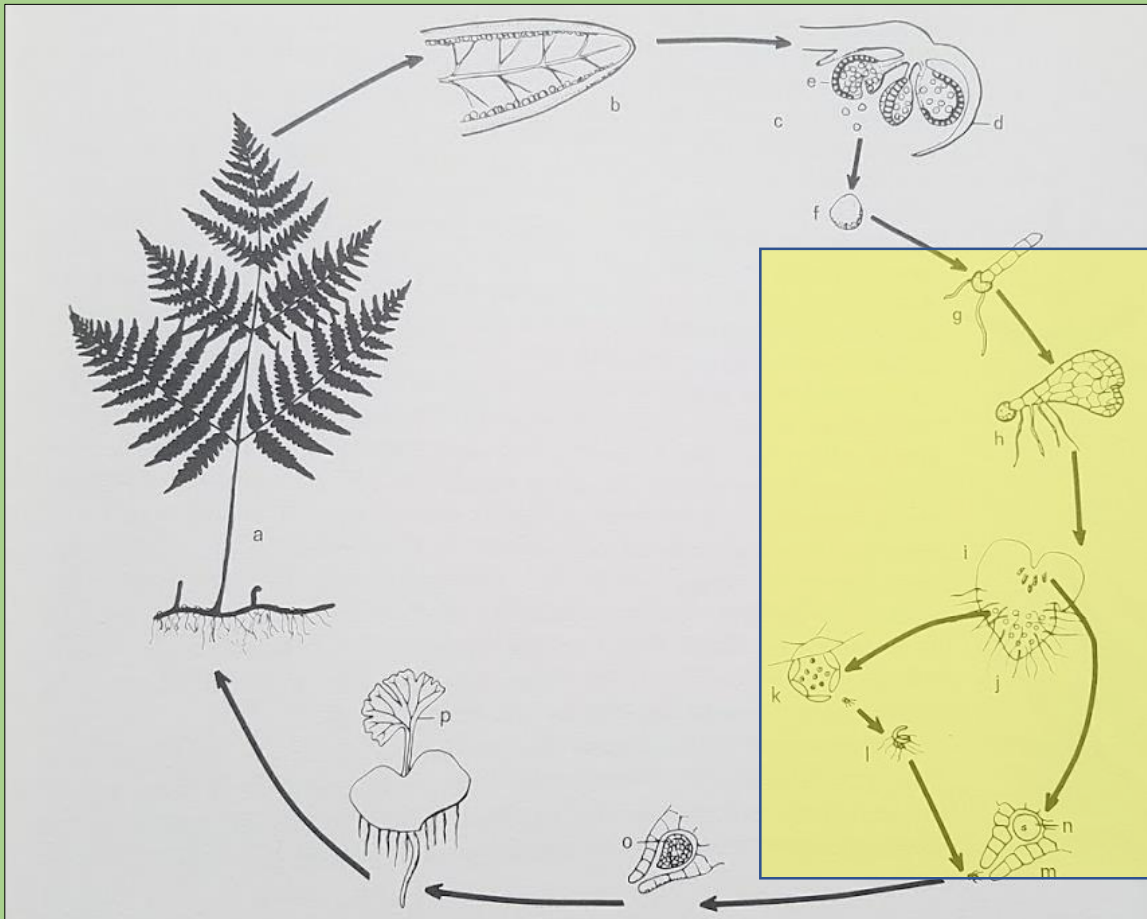
The sporophyte stage is what we most commonly encounter when exploring in the field.

Fern life cycle-spore production.



Spores form during the sporophyte stage of this Polypody fern.

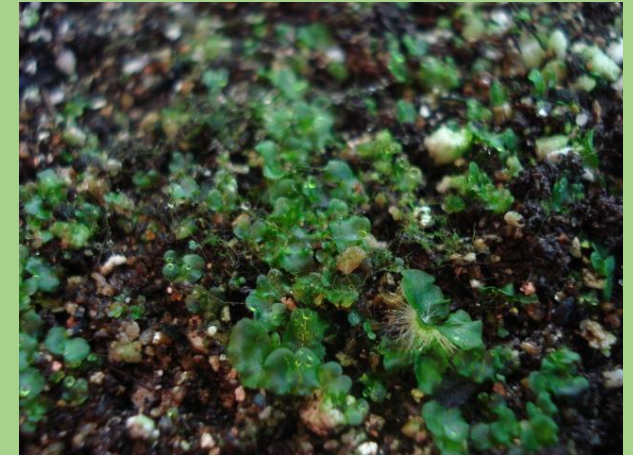
Fern life cycle-prothallus formation.



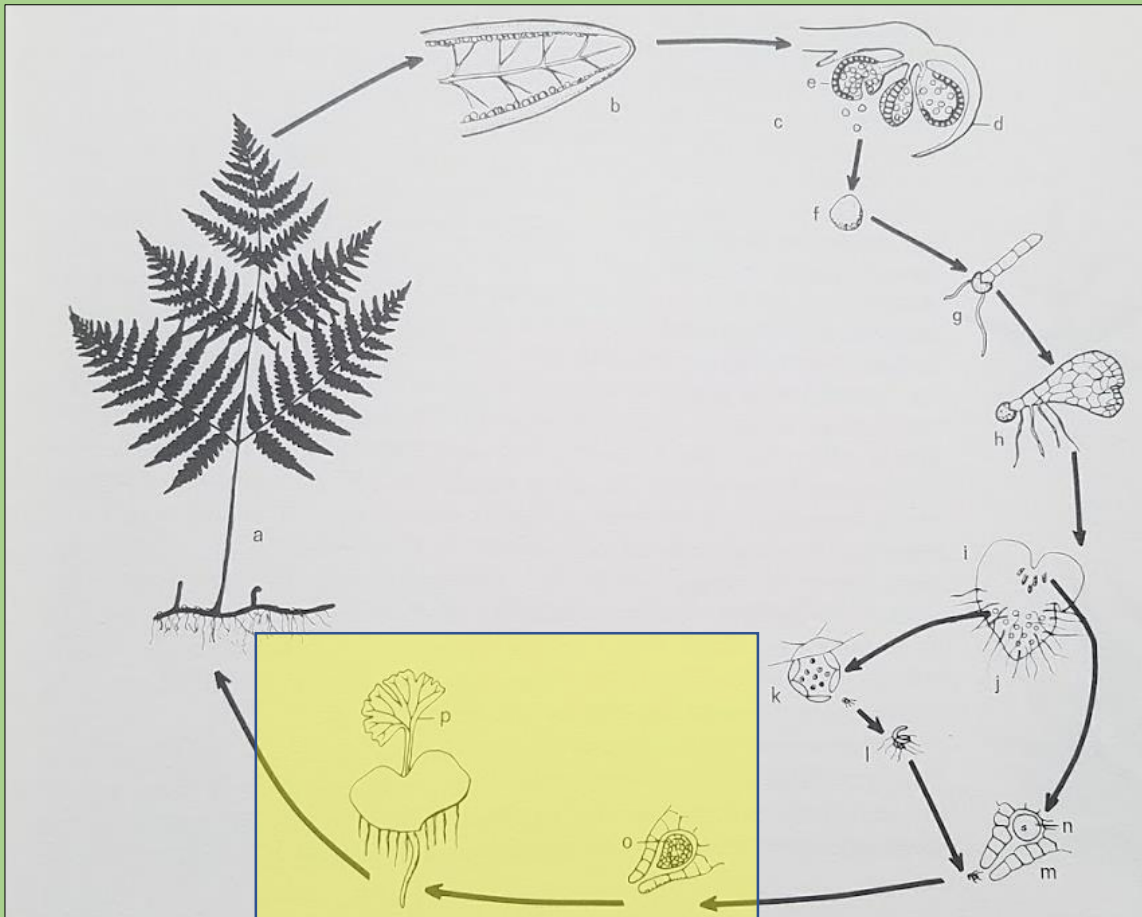
Spores will form a prothallus, where reproductive organs develop and fertilization takes place.

This is the other free living form referred to in the alternation of generations concept.

Same species, but the two forms look nothing alike.



Fern life cycle- fertilization and sporophyte formation.



When successful fertilization takes place the sporophyte stage begins, bearing a slight resemblance to a mature fern.

Growing Ferns from Spores

All ferns can be grown from spores, which produces genetically distinct individuals.

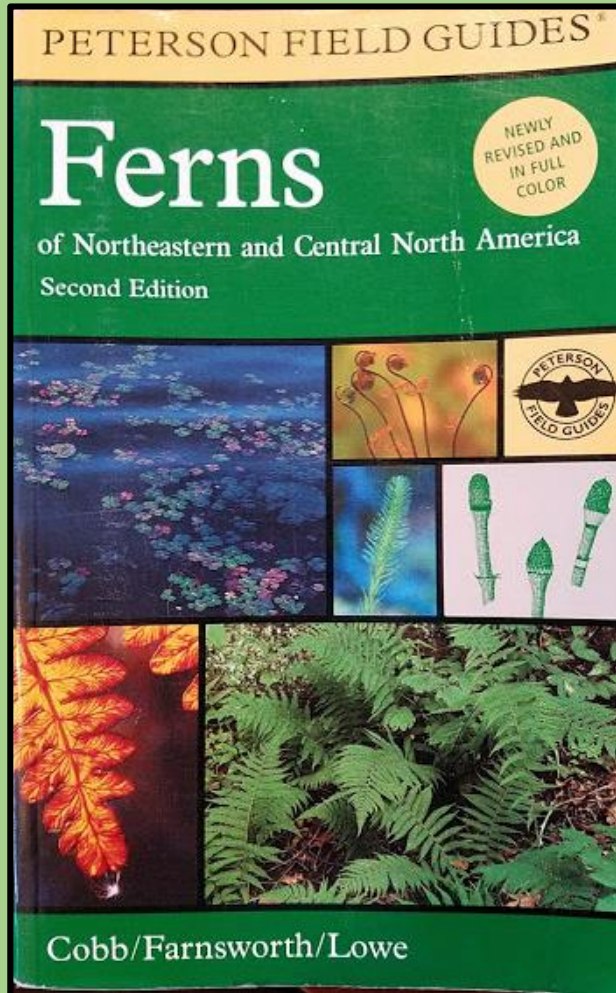


Spores on the underside of a Walking fern (*Asplenium rhizophyllum*) frond.

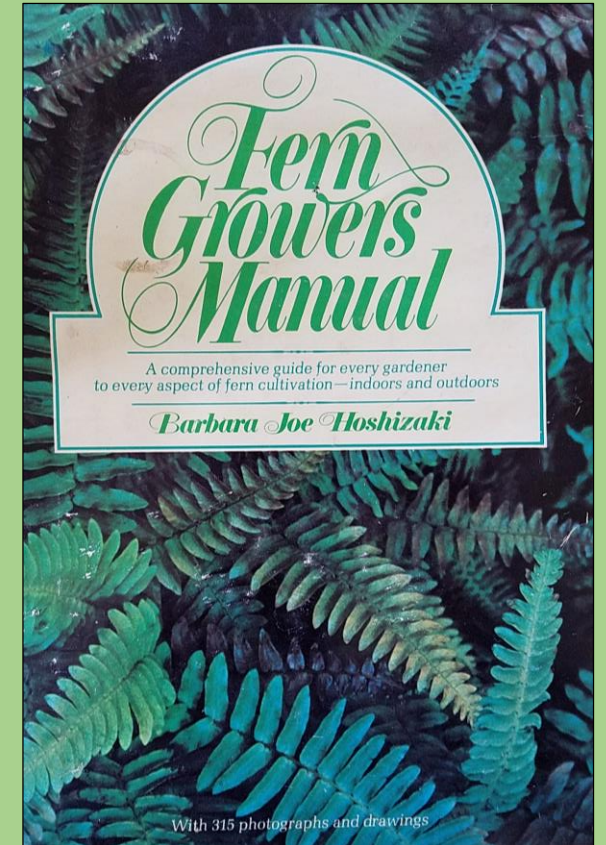


Fertile fronds on a Cinnamon fern (*Osmunda cinnamomea*). Brown color indicates the spores have been released.

Collecting spores from plants; research.



Researching ahead of time and close observation will lead to successful timing for spore collection.



Collecting spores from plants; what to look for.



Interrupted fern (*Osmunda claytoniana*), shown here, has spores that are produced on specialized leaves called fertile fronds, making for quick assessment of spore availability.

The dark color and turgid nature of the fertile fronds indicate the spores are mature and have not dispersed.



The light brown color and wilted posture of the fertile fronds indicates the spores have dispersed.

Collection of spores



To collect the spores, fertile fronds can be plucked from the mother plant and put into an envelope or laid on top of some paper.

As the spore containing organs (sporangia) dry out and rupture, spores are released and can be collected.

This process is similar to making mushroom spore prints.



Sowing spores; procedure.

In order for spores to start growing they to be in a consistently moist and humid environment with suitable media.

Spores should be sown shortly after being collected, many are intolerant of long storage, some are very short lived.

Sealable plastic containers work best; a tight lid allows for high humidity and moisture but can be cracked opened to exchange air.



Sowing spores-media selection and considerations.

Media selection can be tricky; you need one that holds water, but does not stay water-logged, and one that has some texture to it to support the developing prothallus.

Coir and ultra refined seed starting mixes do not provide enough structure for development during the prothallus stage.

Proper drainage is important; the medium in your container should be an inch or two in depth. Drainage holes may or may not be practical. A coarse layer of perlite or pea gravel as a bottom layer will keep water from pooling.



The coarse uneven texture of this potting soil provides excellent micro-terrain for fern spores to develop.

Sowing spores-containers.



Off the shelf convenience-these snap tight lidded containers are readily available; rigid sturdy plastic.



Salad mix containers work great too, but the thinner plastic can be unstable when moving your fern colonies around.

Sowing spores-pitfalls.

Sow spores on a medium that preferably has been sterilized. Small batches can be cooked in the microwave or oven.



Sterilized media is helpful in controlling mosses and fungi that love the same moist environment that our ferns do.



Fern cultures can be overwhelmed and fail due to prolific growth of competing organisms. Poor drainage caused this colony to fail.

New sporophytes-almost done.



Small leaves indicate completion of the life cycle, kind of like a chick hatching from an egg.



The plantlets can be moved on to individual pots and nurtured until they can be planted out.

Questions or comments regarding the material in today's presentation?

Email me at nativehaunts@gmail.com

Call me at 207-604-8655

Spores are seasonally available for many common species including;

Cinnamon fern, Interrupted fern, Royal Fern, Sensitive fern, Polypody fern, and Wood fern.