

Fern Propagation 101[®]

Terry Berger

Aris Horticultural Services, 12206 28th Place, NE, Lake Stevens, Washington 98258 USA

Email: terry.berger@arishort.com

INTRODUCTION

What follows is an outline of how to propagate ferns.

Prerequisite: Basic math, powder/liquid measurements, and common sense growing.

Background:

- Spore germination — Gametophyte (heart shaped and sometimes mossy looking)
- Sperm cells to eggs
- Male structures (antheridia / sperm cells) female structures (archegonia / eggs)
- Sporophyte emerges from gametophyte
- Sporophyte matures into parent fern and produces spore.

Step 1: Collect your spore

- Spore matures at different rates
- Many types of spore
- Green spore should be refrigerated (short life span)
- Most spore keeps 1 to 2 years / even longer

Step 2: Sow your spore

- Mix 1 teaspoon of spore / 1 cup of fine vermiculite, this mixture will sow 10 flats.
 - Variables include how old spore is, how difficult to germinate, etc.
- Soil: peat based, well drained, slightly acid (pH 6.0 to 6.5).
 - Always exceptions to the rule: i.e., sow *Osmunda* spp. on straight peat.
- Wet (soak) your propagation mix down with clear water
 - Evenly disperse thin layer of spore / vermiculite mixture
 - Heavy spray (srench) with Chipco 26019 (wetttable powder only) at 1 tablespoon/gal
 - Cover with clear plastic or put into clear plastic bag

Step 3: Germinate your spore

- Temperature of 65–70 °F works well (take into account heat coming from lights)
- Under lights — long days recommended, 24/7 works well
- Do not bake in direct sunlight
- Remove plastic cover at first sign of greening (3 to 12 weeks depending on fern species)
- Water (carefully) only with clear water and keep moist

Step 4: Care for your gametophytes

- Do not bake in direct sunlight!, 60% to 70% shade needed
- Temperature of 55–75 °F

- Sperm cells migration to eggs requires misting / watering
- Use clear water with no fertilizers
- Warm sunny days: mist heavily 3 to 6 times depending on day length
- Warm cloudy days: mist heavily 3 times depending on day length
- Always allow enough time for gametophytes to dry off by nightfall
- Sporophyte development time varies with specie:
 - *Athyrium* — 10 to 16 weeks
 - *Osmunda* — 10 to 36 weeks
 - *Dryopteris* — 12 to 24 weeks
 - *Polystichum* — 12 to 24 weeks
- Always exceptions to the rules
- Chipco 26019 (powder only) at 1 teaspoon/gal
- Enstar for fungus gnats no good
- Orthene WP for severe gnat infestation cases

Step 5: Transplanting your sporophytes

- Crowd them and transplant them several times
- 200 to 300 per 10-in. × 20-in. flat (1st transplant)
- 70 to 100 per flat on 2nd transplant. Plug tray fine at this step.
- Plant small clumps to a 4-in. pot
- Usually best to go with a well drained, peat light mix while plants are small
- pH should be 6 to 6.5 for your soil mix
- Begin fertilizer at 100 ppm N every other watering
- Ferns hate salt build up and require very little fertilization
- Continue with 60% to 70% shade and 55–80 °F degrees for growing on.

Step 6: Finish your fern to maturity, market your fern, and sell your fern

ADDITIONAL READING

Hoshizake, B.J., and R.C. Moran. 2001. Fern grower's manual. Timber Press, Portland, Oregon.

Mickel, J. 2003. Ferns for American gardens. Timber Press, Portland, Oregon.

Olsen, S. Encyclopedia of garden ferns. 2007. Timber Press, Portland, Oregon.

QUESTIONS AND ANSWERS

Corey Barnes: I'm working with a species of *Lepisorus* spp. from the Sichuan Province. I planted the spores 9 months ago and they're still sitting and staring at me. I have gametophytes and I'm wondering how long they can survive before sporophytes are formed?

Terry Berger: Congratulations. You can hear the frustration in the man's question. You can't give up. You watch for fungus problems and you keep your seatbelt on. Don't get frustrated; be patient. It will pay off.

Corey Barnes: Have you ever seen gametophytes not produce sporophytes?

Terry Berger: Only if they rot. No, they'll just keep on going until conditions are perfect.

Corey Barnes: Can fertilizer be added?

Terry Berger: You can feed them and bulk them up as long as it's low amounts of fertilizer (50–100 ppm). I don't ever recommend it, though. Most people will burn them right up.

Patrick Peterson: How do you go about cleaning the spores before planting?

Terry Berger: After we bag them we put them through really fine sieves. Many ferns have lots of chaff or hair that can be separated from the spores with sieves.

Angela Anderson: Have you tried using slow-release fertilizers added to the soil medium before planting the spores?

Terry Berger: We never have. We don't add fertilizer until we see sporophyte formation.

Angela Anderson: We saw too much yellowing.

Terry Berger: I know you can get away with low amounts, but I also know you can burn them easily.