



# Propagating Ferns

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### I. Introduction

Ferns are among the oldest known plants, and may be found all the way from the tropics to high rocky mountain slopes. Some species are extremely small and delicate, while others achieve the heights of trees. Ferns, with their beautiful leaves (fronds), are a most welcome sight in the garden or home. However, the number of ferns that occur in the temperate zone is only 15% and of those, only a relatively small number are available to gardeners.

So what distinguishes ferns from most other plants? Basically, the absence of flowers, fruits and seeds are the key distinguishing characteristics. More specifically, at the proper time of the year, examination of the bottom side of a frond will show rusty patches which produce spores. These are unicellular structures which are the focus of fern reproduction. In fact, the whole fern plant is called a **sporophyte**, or spore-bearing plant.

### II. Choices of Propagation Methods

Although the main focus of this presentation is propagation of ferns with spores, it should be mentioned that there are two other ways in which they may be propagated. The first is vegetative budding and the second probably most frequently used, is division of the rhizomes. However, the spore method is the most challenging and therefore most rewarding. If we are going to understand how to propagate with a fern's spores, it is important to have a brief description of its botany and life cycle. (Please refer to the page entitled "Life Cycle of a Fern.")

### III. Life Cycle of a Fern

In general, the fern plant is divided into three main parts; the roots, modified stems called rhizomes, and the leaves, called fronds. It is the latter we will now focus upon. Later in the growing season, fertile fronds develop **sporangia**, which are the spore-producing organs. Together in groups, these are called **sori**. At the right time, millions of single cell **spores** are released and fall to the ground and begin to divide. What is formed is a spongy like cushion, which is really thousands of miniature plants, one which is called a **prothallus**. It is this which produces the **sperm cells**, which must swim along moist surfaces to the female egg producing organ, the **archegonia**. Upon fertilization, now the second phase of the plant begins to grow into the familiar fern we will recognize.

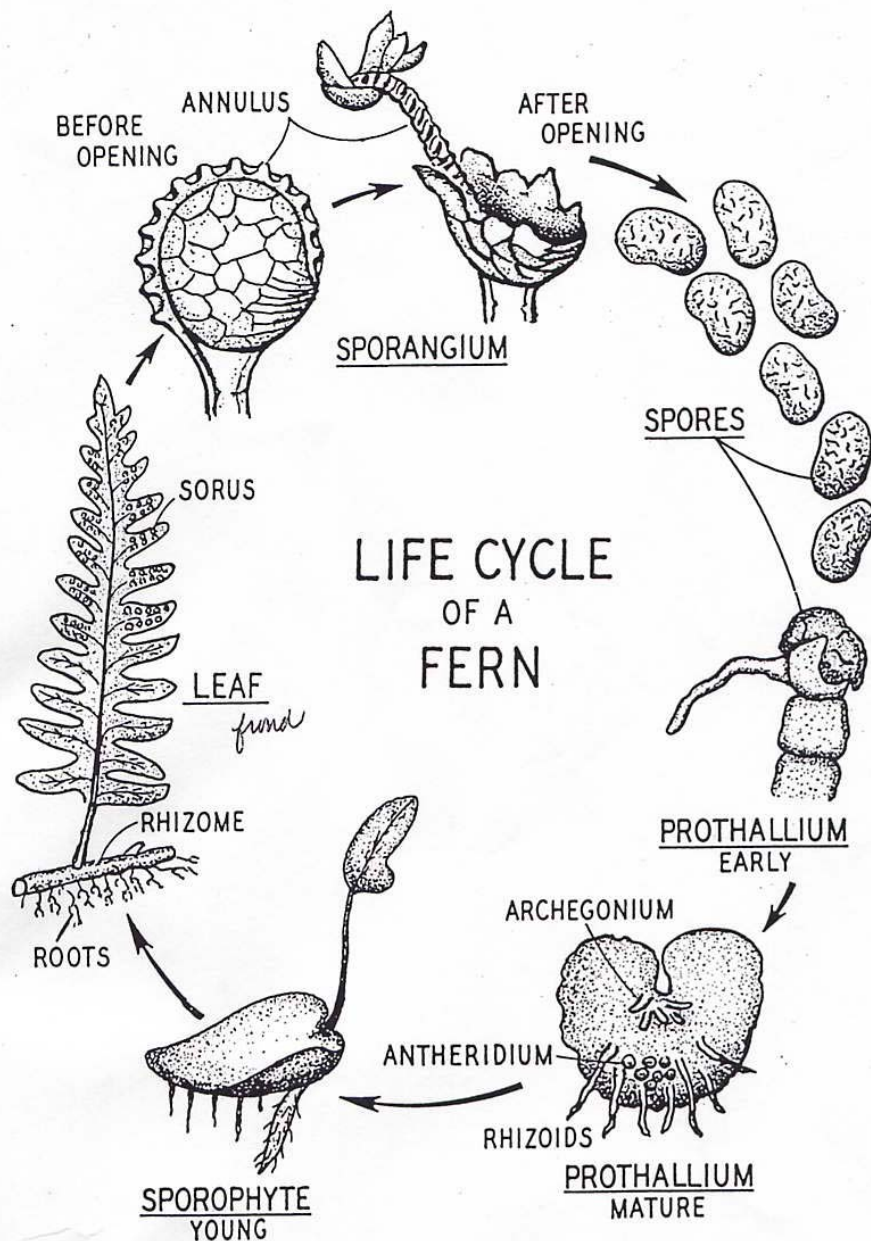


What is first seen are **croziers**, which are the fronds unfurling and look like violin scrolls.

#### IV. Propagation with Spores

Collecting the microscopic single celled spores is the first step. One way is to obtain them from a fern growing organization, usually made up of amateur fern enthusiasts. One excellent source is the American Fern Society. However a faster method is to collect your own. So here is an abbreviated step by step method to collect and propagate ferns by spores.

1. Lay a mature frond (with obvious sori underneath) between two sheets of paper. Allow to dry in a warm, dry and draft free area for about two weeks. Then take off the top sheet, remove the old withered frond. Holding the bottom sheet at an angle, lightly tap the paper, causing the debris to fall off, leaving spores. They will collectively look like dust. Now fold the paper in half, tap more vigorously.
2. You will need a clear plastic container, like used for cakes in the supermarket. This will ensure proper humidity. Remember, in fern culture, the three growing essentials are light, soil and most important, humidity.
3. Use a quality potting soil. After putting the soil into the container, dampen it, but not excessively. Then put the container into your microwave oven and heat it for 3-5 minutes (until steaming steadily). This ensures killing any bacteria and fungal spores.
4. Sprinkle the fern spores on top of the soil. Put the closed container near a north facing window or a several feet from a south facing window. The key is adequate light, yet minimal heating. This is the tricky stage!
5. The next step is to wait, then wait some more! It will be 6-8 weeks before you see the little "prothallia" growing up. They should be about 3/8" inch in width. If they are too crowded, thin them. Otherwise they will only produce male organs. During all this time, be extra vigilant to be sure your soil does not dry out.
6. When about 3/8", the mature prothallia produces the sperm which needs moisture (use a sprayer) to fertilize the egg. Now the future sporophyte will begin to grow.
7. After another agonizingly slow 6-8 weeks, smaller ferns will come up, the first being about 1/2" tall. Thin them so they are about 3" apart.
8. In the spring, gradually allow the ferns to acclimate to the drier, outside air by opening up the top of the container a little bit each day. The open time should be slowly increased for about 2 weeks. This is the most delicate stage. Don't rush this!!! Here is where most new ferns "bite the dust!"
9. Plant your little babies in a mostly shady spot. Remember, they do need some sun, preferably morning.
10. Good luck!



The illustration above is not drawn proportionally, but in a size to show function of the individual parts.  
 Taken from: Ferns, To Know and Grow (F. Gordon Foster<sup>7</sup>)

## V. References

### **Ferns, To Know and Grow**

by F. Gordon Foster, Timber Press Inc. 1995

### **Ferns: Wild Things Make a Comeback in the Garden**

edited by C. Colston Burrell  
 Brooklyn Botanical Garden Inc. 1994

### **American Fern Society** (an interesting website)

Internet access: <http://www.visuallink.net/fern/>

### **Fern Growers Wholesale Supply Inc.**

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