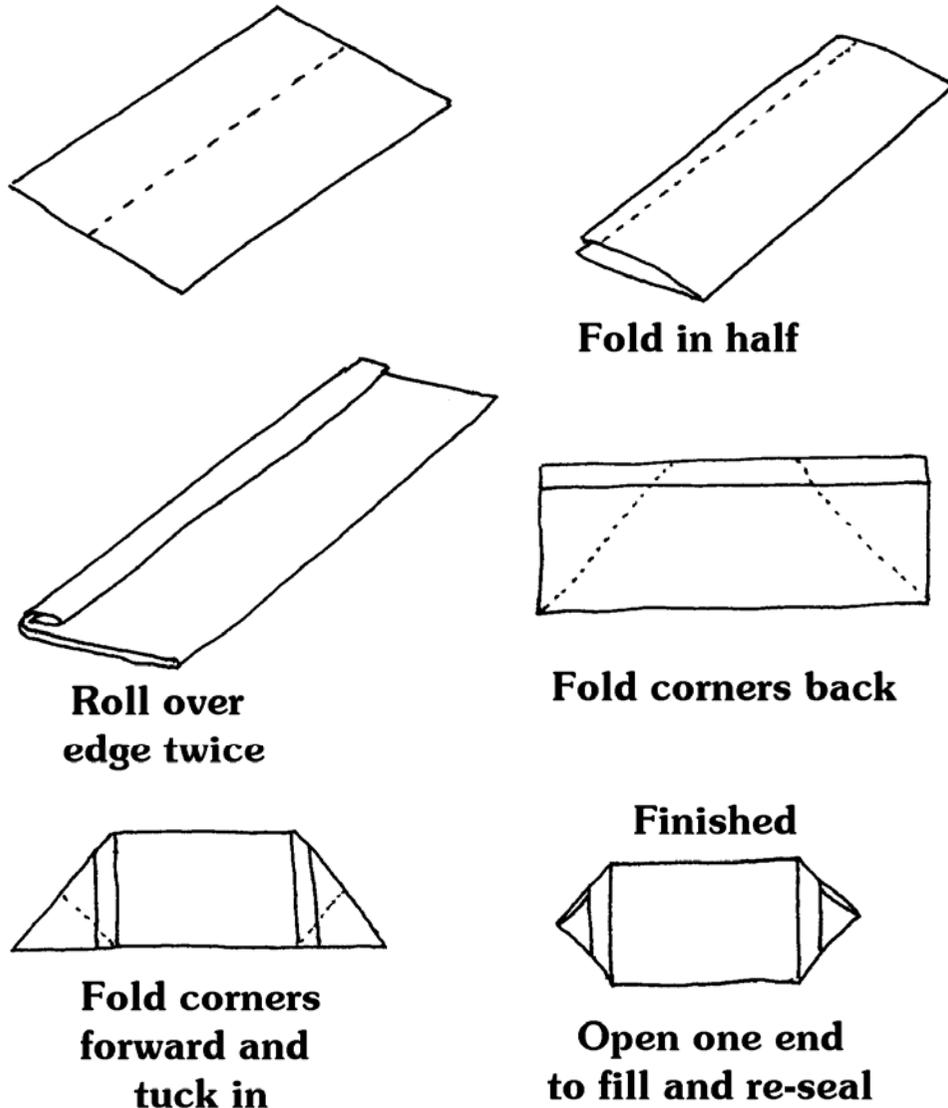


The 'Wright' Way to Collect and Clean Fern Spores



Fold in half

Roll over edge twice

Fold corners back

Finished

Open one end to fill and re-seal

Figure 3 - How to fold an 'Origami style' spore collecting and storage packet.

Materials

Paper to make collection and storage packets, e.g., Clean A4 copier paper.

A sheet of glass e.g. from a cheap picture frame approx 30 x 20cm (sand of any sharp edges).

A craft knife blade - 'Stanley

knife' type, 6cm long, trapezoidal.

Dust mask - if cleaning a lot of spores at once.

A short - 30cm - length of garden cane.

Methylated spirit and cotton wool.

Collecting Spores

Where are they?

Spores are usually found on the underside of fern fronds in structures called sporangia. These are like drumsticks filled with spores that are grouped together to form a sorus, or sori (see Figure 1). The sori are sometimes covered by a flap or disc called an indusium. This is the 'chaff' that needs removing to get a clean sample of spores harvested from a suitable frond.

Sporangium

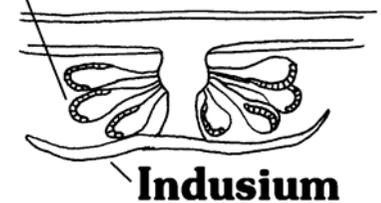


Figure 1 - Cross-section through a sorus

When are they ready?

Not all fronds on a plants develop sori. Some species produce sterile fronds during the early part of the year and only produce fertile fronds at the end of the season. In some species these frond look very different. Catching the plants at peak spore production requires a little patience and skill. Inspecting plants at weekly intervals, as the spores ripen, is the most reliable way of ensuring a good harvest. On most species the sorus starts as small translucent dot on the frond which gradually enlarges. As the spores inside the sporangia ripen they tend to darken to a dark brown or black colour. When ripe the sporangia split open along the stomium and liberate the spores (see Figure 2). As this proceeds, the empty husks of the sporangia take on a brownish



colour. Although most of the spores will have gone there will still be some sporangia which have not yet released their spores. The tight knotting of the sporangia in a sorus will trap some spores that have been released. So it is always worthwhile trying to collect spores from plants where all the sporangia have turned brown to pale brown, especially if you become skilled at cleaning the sample. Spores of some species, like *Polystichums*, tend to stick to the inside walls of the sporangia. So, don't give up hope if you miss the optimum time, it is always worth trying to collect spores at almost any time after they ripen.

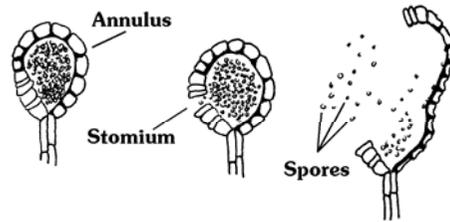


Figure 2 - Diagram showing how spores are shed from the sporangium

Not all species have black or brown spores. Species like *Polypodiums* have yellow spores. These are ripe just as the sori start to turn orange or orangey yellow. *Polypodiums* also seem to produce ripe spores over a long period. Within a sorus, some sporangia shed early and others will take longer to ripen. *Polypodiums* are a special case for another reason. In Britain the three common wild species are *Polypodium vulgare*, *P. interjectum* and *P. australe* (Syn *P. cambricum*). These species ripen at different times of year. *P. vulgare* is first, from July/August onwards, followed by *P. interjectum* from August/September and *P. australe* from December onwards. When collecting from garden cultivars and wild varieties of these species it is essential to know the species to be able to start looking for ripening sporangia at the right time of year.

Another special case are the short viability species like *Matteuccia*, *Onoclea* and *Osmunda*. These yield green spores that contain chlorophyll must be sown fresh or they will quickly lose viability.

How do I collect them?

Whenever the spores are ready they need to be collected. The best way to do this is to put a frond, or part frond, into a paper envelope or similar. We use standard 'origami style' packets. The way to fold these is illustrated on the back page (Figure 3). A4 photocopier paper makes packets which hold most fronds likely to

be collected. Smaller packets (A5) can be made for smaller specimens and A3 for large fronds. Open one end of the packet, cut off a piece of spore-bearing frond and push it well down using the length of garden cane as a ramrod. Close the end, label and store in a cool dry place for a week or so to allow the frond to dry and the spores to shed. Always use paper, never plastic bags (unless you are certain the spores are completely dry) as these will usually cause the spores to go mouldy.

Cleaning Spores

As the fronds dry out, more than just the spores will be liberated. Indusia and sporangia will also detach themselves and become mixed up with the spores. These ideally need to be removed to leave a nice clean harvest of spores for sowing.

This is where the glass and knife blade come in. Open the collection packet (dust mask optional) and tip the contents carefully onto the glass. You may need to invert the opened packet and tap with a pencil to liberate spores stuck in the fibres of the paper. Remove the frond and any large fragments. The spores can now be separated from the 'chaff'. Push all the spores plus debris into a pile furthest away from you on the glass and tilt it towards you at about 45°. Gently move the glass from side to side, increasing the vigour until the spore mass starts to move and flow forwards down the slope. Generally the chaff will roll down the glass, while the powdery spores will stick and be left at the top. Discard the chaff by running the knife blade across the glass like a bulldozer and discard. Repeat the process until the sample is clean. The pure spores can be scraped off into a new packet and labelled. Store in an airtight box in the fridge until needed. The glass and blade should be cleaned by wiping with cotton wool dampened with methylated spirit between each species to prevent cross-contamination (NO SMOKING!).

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