

Magnolia hybridizing

Dennis Ledvina

The hybridizing of magnolias is a fascinating and rewarding adventure that I encourage more of our members to try. I will admit that it does require some degree of patience since seedlings will not bloom for at least four years and may require up to a dozen years to flower. All of us are very fortunate to have had two great magnolia experts, Phil Savage and Augie Kehr, to provide us with a good genetic pool of primary crosses and mentoring expertise.

The equipment required to get you started is very basic but essential. First, you should buy several small paper coin envelopes for storing pollen. I find that it is necessary to seal all but the top flaps of the envelopes with transparent tape to prevent the desiccant from mixing with the pollen. I prefer paper envelopes to gelatin capsules, which tend to hold moisture, causing the pollen to lose its viability. While you are at the office supply store, get several watercolor paint brushes of a fine, thin-line type. Next, go to your garden supply store and get some silica gel to serve as a desiccant to keep your pollen dry. You will also need to purchase some red plastic tags, a color that will be easy to find in the dense fall foliage. Finally purchase an insulated container with a tight-sealing cap for the storage of your desiccant and pollen.

Your next job is to go out and collect some pollen. Timing is crucial since if the flowers are picked too early the stamens shrink and harden and the anthers never open. If they are picked too late most of the pollen is lost. For subgenus *Yulania* taxa, the best time to collect pollen from a flower is when the stamens are springing back (spreading) slightly from the base of the androecium, which will occur 12 to 24 hours after the flower has opened (see Figure 1). In subgenus *Magnolia*, the stamens will detach from the androecium instead of springing back. Thus, they must still be taken within the 12 to 24 hour time frame before they fall off on their own.

Collect the stamens and place them on a sheet of white paper in a warm room out of direct sunlight. Watch for and remove those beetles. If the stamens have already split and dehisced, little pollen will be collected. The following day there should be golden pollen on the white paper. Remove the stamens, put a fold in the pollen covered paper to form a chute, gently tap the bottom of the paper to direct the pollen into the chute and then



Figure 1. The best time to collect pollen from a flower is when the stamens are springing back slightly from the base of the gynoecium which will accrue 12 to 24 hours after the flower has opened.

slide the pollen into one of your envelopes. Place a couple of inches of silica gel in the bottom of your insulated container, stand the labeled envelope in the silica gel, and place the sealed container in the refrigerator. (Using the insulated container prevents the destruction of your pollen by the defrosting cycles of your refrigerator.)

Look over the magnolias you intend to use as seed parents and find buds that are about to open or have freshly opened. A receptive bud is one that has its stigmas curled back and with a glisten on the upper surface of the stigma. (See Figure 2.)

A brown stigmatic surface or the folding of stigmas against the gynoecium are signs that it is too late to pollinate a flower. In section *Rhytidospermum* the flowers will open in late afternoon, be receptive to pollen most of the night, and release their pollen the next afternoon. I have made successful crosses in this section at 11PM using a flashlight! With a brush, apply a small amount of pollen on the receptive stigma. It is important to use a different brush for each pollen used and to clean the brushes completely after the use of particular pollen. It is not necessary to remove the stamens from the pollinated flower since the flower will no longer be fertile when the stamens have dehisced. Some hybridizers urge tying the flower shut to prevent contamination from other pollen, but I have discovered that this frequently causes mold and moisture to destroy your pollinated flower. Tying might prevent some airborne pollen contamination but will not prevent beetle contamination. Label the cross with a red tag and you are all set to wait for the results.



Figure 2. A receptive bud is one that has its stigmas curled back and with a glisten on the upper surface of the stigma.

An unfertilized gynoecium can develop and hang on for some time. If fertilization has taken place, there is more development of the carpels containing seeds, giving the capsule an irregular appearance. The Magnolia Society Web Site (www.magnoliasociety.org) has excellent information on the process of cleaning and storing seed.

Unused pollen can be frozen and used successfully the following spring. I cover the envelopes containing pollen with silica gel and place the insulated container in the freezer.

Good luck and hopefully you can even share some of your success with the Magnolia Society Seed Exchange.

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