

How easy is pollen collecting?

by Lennarth Jonsson

One way to acquire a variety of magnolias suitable for a harsh climate is through selective breeding which, in turn, calls for reliable methods of gathering, storing, and shipping of pollen. I decided to try to find appropriate methods to achieve these ends. I had no idea, until considerably later, what a challenge it would be!

Being absolutely ignorant on the subject, I checked out the literature studying such articles as "Gathering gold dust" by Philip J. Savage, Jr. in *MAGNOLIA* Issue 35; "Magnolia breeding possibilities" by Joseph C. McDaniel (*Plants & Gardens*, vol. 30, No. 1, 1974); and an article, 'Kehr to run AMS pollen bank,' quoting August E. Kehr, in *MAGNOLIA* issue 28.

To get further information, I contacted some experienced breeders. In a kind reply, Phil Savage told me he had tried just about every method through the years for storing collected pollen, but the only one that had been successful for him was to separate the pollen from the dried stamens before storage or shipment.

"Rhododendron pollen will remain viable when shipped within the dried stamens in a glass jar, but in my experience magnolia pollen will not. Pollen stored in little white, 1-3/3 × 2-7/8 "druggist's" envelopes (the yellow pollen shows up well on the white paper), and plunged into silica gel desiccant is almost sure to remain viable (the paper envelopes seem to let the moisture escape into the silica gel) unless it has been in the open air too long before shipping and absorbed enough moisture to start mold. Don't let the desiccant

get into the envelope! Pollen naturally shed in the flower and collected from the tepals is almost always useless, in my experience."

Phil raised my concern about the sensitivity of magnolia pollen to moisture and mold. It was obvious that the pollen must be handled with the utmost care to keep it dry and thus avoid the start of mold.

When is the proper time to harvest the buds/flowers? Phil emphasized that this is the most critical moment in collecting pollen. "If the flowers are gathered too early, the stamens will shrink and harden and the anthers will never open. If they are picked too late, by just an hour, not a grain of pollen remains."

Knowing that cool days and frosty nights could delay the opening of flowers for several days made me aware that there would be some trouble involved. "On the first decently warm day (while you are at work) they pop wide open and shed all their pollen in an hour." This remark by Phil underscored the fear I felt. Phil's advice: "The safest course, with these early birds, is to gather 10 to 20 flowers a day, around noon, when the stamens are just beginning to move away from the central column of the gynoecium."

My first trials were made on *Magnolia kobus* and *M. stellata*. I watched the specimens every day and when the first buds were about to open, I cut 25 of them, after making sure that the anthers had not already dehisced (the zipped-open anthers are easily seen by use of a reading glass). After stripping the buds (half-opened flowers) of the

tepals, slicing the gynoecium straight across just above the topmost row of stamens, and making sure that any beetles on the flower had departed (following Phil's instructions), I stood the flat-topped gynoeciums upside down on sheets of white paper in a quiet room (about 70-75° F.). The next day all the defrocked parts had shrunk and dried, and not a single grain of pollen had shed. A complete failure!

This exercise was done over and over again and no pollen was found when the white papers were inspected. By then the blooming of the early birds was over and I started with *M. sieboldii* which, according to Phil, should have been considerably more productive. But the results remained unchanged.

Somebody told me: "Try an exsiccator and put it into the refrigerator." I was desperate and ready to try anything and for the first time I managed to get "gold dust" out of the flower anthers. Full of excitement, I opened the exsiccator and within a second the blue gel became white. I had, of course, forgotten to wait until the exsiccator was warmed up. The humidity of the warm air in the room had condensed on the cold pollen and gel. I had to start all over again, recovering the gel by heating it up and cutting more flower buds. Then, at last, I managed to collect the first pollen lot.

Still doubtful that I had found the right method, I asked for information about obtaining pollen from the tender magnolia species. I became even more concerned when told that it was difficult to obtain any pollen, even with an exsiccator. That spring was unusually wet and in one case when the buds were cut, on a rainy day, it took almost six days for the pollen to shed. The amount of pollen was small.

In a kind reply to my inquiry, Lola Koerting said: "I have found that the best way is to cut the flowers before the anthers dehisce, bring them inside and put the stems into a narrow container filled with water and set the container on a sheet of wax paper. Very soon the pollen grains will fall on the paper and can be easily collected."

A friend tried this with flowers of *M. × veitchii* and the result was encouraging. He also obtained an abundance of pollen from a flower that had fully opened and had been put aside in the belief it had already shed its pollen. This made me curious, so I started studying Treseder's 'Magnolias.' On page 86, I found: "Johnstone referred to a peculiarity in the pollen-shedding stage of *M. campbellii*, which the author has been unable to verify. He recorded that the stamens of *M. campbellii* shed pollen before the four inner tepals unfurl, but the author has failed to observe free pollen on the anthers of any flowers from numerous trees of this species until they have become virtually spent and sometimes not before they have shed their tepals, having only the gynandrophores at the end of the peduncles."

Treseder added: "The same applies to all other precocious magnolias which have been examined. One cannot help wondering if this phenomenon was observed on a flower which had been removed from a tree several hours previously in this manner." And about *M. campbellii* sp. *mollicomata*: "The stamen filaments are a pale shade of rosy purple and, when the flower begins to fade, the creamy stamens split open to shed whitish pollen." About the "Lanarth Group" (some flowers had been brought indoors): "The flowers were kept in water and the stamens did not begin to dehisce