

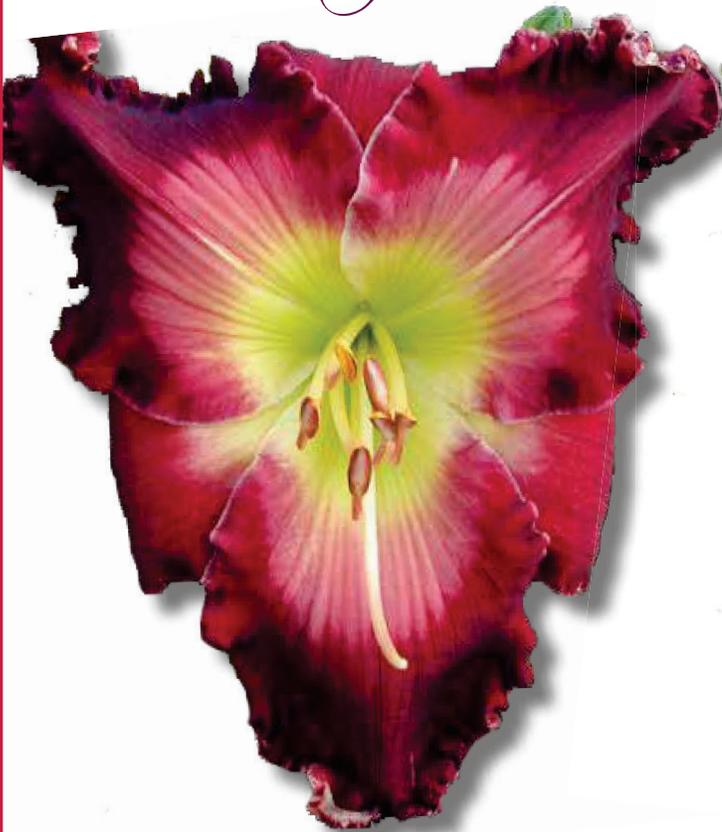


Daylily PIONEER

American Daylily Society Region 1: IOWA / MANITOBA / MINNESOTA / NEBRASKA / NORTH DAKOTA / SOUTH DAKOTA

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2020 Region 1 Honorable Mentions



Via Dolorosa (Emmerich, 2009)



Finish the Race (Emmerich, 2009)

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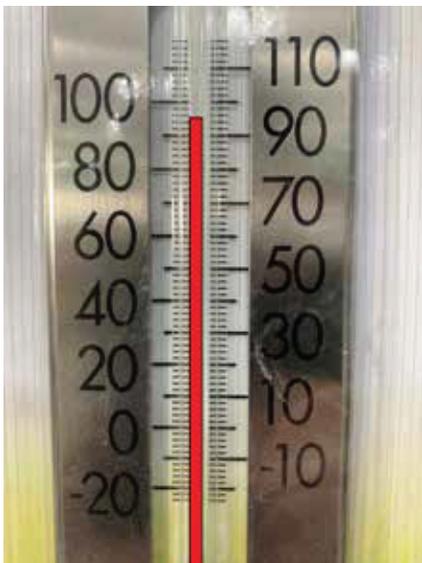
Hybridizing Daylilies Tips & Tricks by Scott Keller

Preface

Hybridizing (crossing two daylily cultivars with the same ploidy) has been a summertime preoccupation of mine for the last ten years. The pleasure of waking each summer morning and being greeted with seedling blooms that I've created is a morning pleasure. Knowing that these blooms are unique, one-of-a-kind creations adds to the excitement and is a true joy.

While the hybridizing process is simple—placing one daylily bloom's pollen on another daylily bloom's pistil—it has been a journey on which I continue to grow. I am grateful to those who have mentored me (Dave Hansen, that's you). While each hybridizer over time comes upon what works for them, the following are thoughts and tips I have learned along the way. My hope in writing this article is to provide a 'long distance' mentoring opportunity for budding hybridizers wanting to further develop their skills.

First, while the process of hybridizing is simple, failure often occurs with flowers not pollinating and pods not developing.



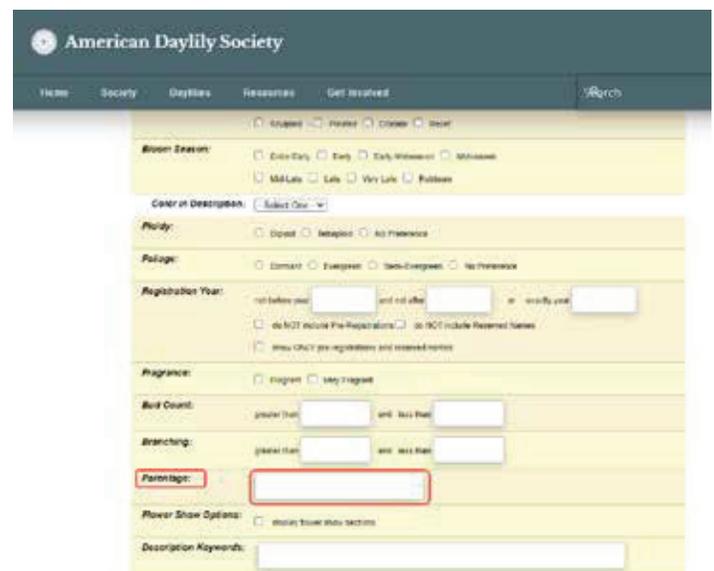
One of the biggest insights for the young hybridizer to understand the impact of weather stress.

In my garden (Zone 5b), most pods set when daytime high temperatures range between 70°F and 85°F. When temperatures reach the

mid-90s and above, pod setting is often near impossible. Exceptions do occur (anything can happen

with highly fertile pod parents), but success rates normally decline as daytime high temperatures rise. This can discourage new hybridizers causing them to think their best efforts are fruitless or that they are doing something wrong. However, it is common that during periods of high temperatures, almost no pods set. Conversely, during cooler temperatures, a higher percentage of pods do successfully form. As an illustration, over my garden's seven-week bloom period, pod set success rates average 20% to 25%. Typically, I pollinate 800 flowers and harvest 150 to 200 pods each summer.

Secondly, individual variety fertility also affects pollination success. Most daylilies have fertile pollen, but not all daylilies are pod fertile. Many doubles lack pistils, which are necessary for setting pods. Hybridizers that release new varieties often include fertility strengths in the description of their introductions. Phrases such as, "fertile both ways", "pod difficult" or "fertility unknown" can be helpful information when choosing breeding plants. However, there are other indirect ways to get an indication of fertility. When having trouble with pod set on a specific variety, one resource I use is the American Daylily Society (ADS) daylily cultivar database to determine if others have been successful in creat-



ing crosses with a specific cultivar. To access this database click <https://www.daylilies.org/DaylilyD->

B/?advanced and scroll down to Parentage. Type a cultivar's name in the box and click SEARCH. If the cultivar is newly registered or not widely distributed, the search may come back with no results; but for older varieties in wide distribution, this can provide a wealth of fertility information. An example of low fertility is 'Brer Rabbit and the Briar Patch' (BRATBP). Year after year a fellow hybridizer unsuccessfully attempted to set pods on BRATBP. An advanced parentage search of BRATBP on the ADS database shows only two child cultivars. Low numbers of parentage search results can imply a variety has low fertility. When reviewing the listings, the first daylily in the cross is the pod parent while the second daylily is the pollen parent.

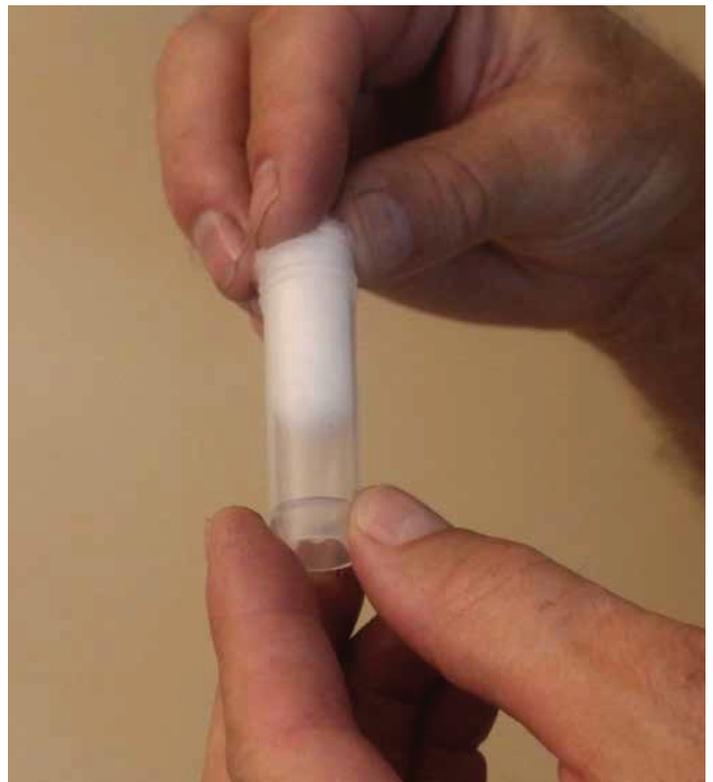


You will note in the example above, that BRATBP was only successfully used as pollen parent, with no seedling entries showing BRATBP as the pod parent. In contrast, a parentage search of 'Rock Solid' (RS) results in nearly 170 seedlings, indicating RS has excellent fertility both as a pod and pollen parent. If you are experiencing ongoing failures, a simple search of the ADS database may provide an answer.

A third tip to improve pollination success is always to have previous day dry pollen available. Periods when pollination rates are higher often follow overnight rain events that cool down morning and daytime temperatures. In general, early morning hours of 6:00 a.m. to 8:00 a.m. offer the best chance of success. However, overnight/early morning rains often ruin the current days pollen as it gets wet, no longer fluffs up, and cannot easily be spread. However, you can use pollen gathered the day before to take advantage of lower temperatures. Pod set success rates will increase as the flowers experience less stress. See the picture of five sets of anthers picked the day before and dried overnight for use the next day. If mornings are very humid and wet, current day pollen may not be available until late in the morning as wet conditions slow anther opening. Using previously gathered pollen allows a hybridizer to set pods early on nocturnal flowers that opened during the night. It is not clear to me how long dry pollen is viable out in the open. I normally don't store pollen this way beyond 3-4 days. For longer storage, I freeze pollen.

A fourth tip is to hybridize using stored, frozen pollen. This allows for crosses of individual varieties across different bloom seasons. Daylilies that bloom early in the season can be crossed with daylilies that bloom late season. It also allows crosses to be made on a day when one cultivar is open, and the other is not.

I have tried several different pollen storage methods, and (for me) the most successful is tubes stuffed with cotton (Figure 1). The cotton is there only to provide easy access to the pollen.



Once filled with cotton, rub pollen off the anther onto the cotton (Figure 2). Then place the cap on



the tube and store the pollen in the freezer until needed. When ready for use, take a tube out of the freezer, remove the lid, wait about 15 minutes for the pollen to warm up, and then apply the stored pollen on an open bloom (Figure 3). You can



carry multiple tubes with caps on in a pocket or apron as you make your way through the garden. Once filled and dabbed with pollen, the tubes should be marked with the variety name. Do not mark the tubes with a Sharpie as condensation on stored tubes in the freezer can cause the ink to rub off. Instead, place a thin strip of masking tape on the tube and write the name of the cultivar on the tape for future reference. After use, discard the

cotton from previous pollen storage, replace the masking tape and re-use the tube for your next stored cross. Some say pollen can be stored indefinitely, but I do not use pollen beyond one year of harvest. Place the tubes of stored pollen in a large freezer bag for ease of access. I use Uxcell 5ml Plastic Centrifuge Tubes with screw-on caps (you can find them online).

When pollination occurs, swelling is visible at the ovary (base of the flower) after a couple days. The flower falls off seven to ten days after pollination, leaving the seed pod to develop. At the time of pollination, I attach Polytree Plastic Waterproof Line Gardening Labels (1" x 1.5" or 2.5 x 3.6 cm) at the bloom base with the pod parent written first on top and pollen parent written on the bottom of the plastic label using a waterproof, black, extra fine DecoColor Opaque Paint Marker. These markers



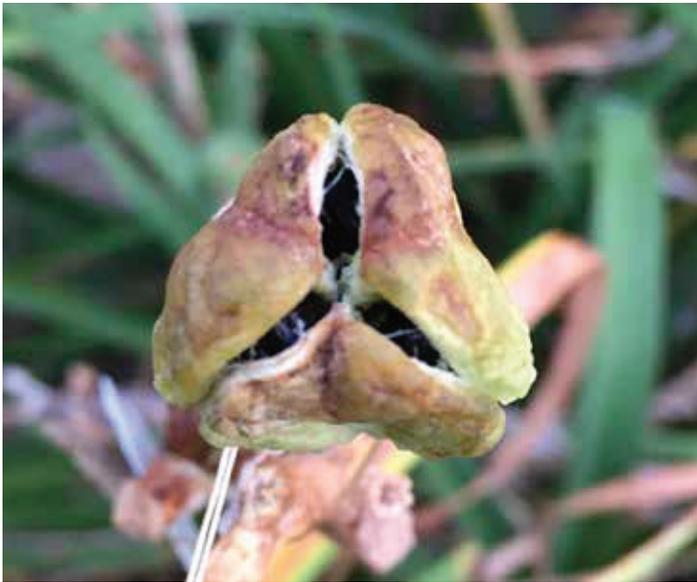
are available at art supply stores or online. Other hybridizers use colored wires and other various methods to record pod and pollen cross information.

Occasionally, pods will abort. This is frustrating but a normal occurrence. Initially the ovary swells like it is forming a pod, but the pod dries up and falls off. This is no fault of the hybridizer and can result



from heat/drought stress or other factors. Be sure the ploidy of the crossed cultivars match. Abortion of pods will always occur when the ploidies of the cultivars are different. For example, attempting to pollinate a tetraploid flower with diploid pollen will result in the failure to form a fully developed pod.

Ripening of mature pods occurs about six weeks after pollination. Harvest pods as soon as cracks become visible between the chambers of the pod. Waiting longer will often result in the pods opening and seed drop occurring (loss of harvest).



Shell seeds, keeping them together with the tag marked with their cross information. Dry them for a day or two indoors (you can use disposable plastic cups or other containers for this purpose). Then place each cross in a sealed, plastic zip-lock bag along with the plastic tag for identification and store them in the refrigerator crisper drawer. Some hybridizers add a small square of paper towel to



absorb excess moisture. Cold storage 1) minimizes germination until planting and 2) provides the cold stratification period of at least three weeks required by some dormant daylily cultivars.

Not all seeds within the pod are viable, so check seeds when shelled and before refrigeration. A simple finger squeeze test will help identify soft, spongy seeds which should be discarded. These seeds will not germinate and will often mold, which can infect an entire batch of stored seeds. Re-check seeds periodically during storage to identify any mold development. If found, discard any moldy seeds in the bag, dip the remaining seeds in a solution of one-part bleach to nine parts water to disinfect them, dry the seeds, and return them to cold storage.

The following is a helpful tip to preserve pods set late in the season. This can be especially helpful in northern states where freezing temperatures risk destroying seeds before maturity. Before the first frost, cut the scapes, bring them indoors, and place them in water. This technique is only suc-

cessful after the pod is fully formed (after about three to four weeks of growth). The pods will mature indoors. The seeds can be harvested after pods begin to open. This technique can also be useful if you are away from the garden for several days and want to prevent seed loss.



I want to thank Mary Baker for the time she spent editing this article. My hope is that it has provided useful information. Questions can be directed to me, Scott Keller, pkdaylily@gmail.com.