SUGARWATER - A NEW APPROACH TO HYBRIDIZING

I began using sugar water crosses in late October of 2000. I had a mutant ‘Dorothy Benedict’ seedling which was a fall bloomer. I began crossing ‘Tardiflora’ and ‘rupifraga’ to the mutant ‘DB’. Cold weather moved in and I was having trouble covering the scapes. A hybridizer friend, Jesse Willetts, suggested cutting the scapes and placing them in sugarwater and continuing the crosses indoors. I use his formula: 4 ounces of water/1 teaspoon of granulated sugar.

I was amazed that the crosses took and the flowers formed seed pods. I left the scapes in the sugarwater for two months. I harvested the pods and placed them in envelopes; the same way as I do when I harvest mature seed pods from outside. These are placed on a shelf above my hotwater tank in a darkened closet. I very seldom place upright flower scapes in bags, as many seed pods fail to open on their own. I let the seed pods dry for 2-4 months until I have time to clean them. All my seed is sown outdoors in early April. Weak seedlings do not survive - so it’s survival of the fittest (natural culling).

I had 34 seedlings from the 2000 cross of the mutant ‘Dorothy Benedict’ (‘Dorothy Benedict’ x ‘Rippling Waves’) x ‘rupifraga’ and ‘Tardiflora’. Most are greens with heavy substance, some with margins, and a few gold splashes.

In the fall of 2001, I used the sugarwater again making the same crosses as listed above. I also crossed the ‘DB’ mutant with pachyscarpa both directions. The pachyscarpa cross yielded many greens and 2 golds. One of the golds is extremely shiny with heavy substance and surpasses the gold color of my ‘Prairie Fire’.

I only made 2 sugarwater crosses in 2002 due to the failing health of my mother. ‘William Lachman’ splash x ‘Azure Snow’ yielded a margined seedling, and ‘Azure Snow’ x ‘Flower Power’ yielded 4 seedlings.

In 2003 I formulated a plan to make all my crosses in sugarwater for the whole year. The following crosses were made solely in sugarwater: NOTE: FP=frozen pollen. ‘Splashed Leather’ x ‘Angel Eyes’ FP; ‘Grand Slam’ x ‘Blue Angel’ FP; ‘Pachyscarpa’ x ‘Bold Ruffles’ FP; ‘Golden Gate’ x ‘Blue Angel’ FP; m. praefllorens x ‘Millenium’; ‘Dorothy Benedict’ mutant x ‘Millenium’; ‘Babbling Brook’ x ‘Angel Eyes’ FP; ‘Mikawa no Yuki’ x ‘Bold Ruffles’ FP; ‘Rhapsody in Blue’ x ‘Angel Eyes’ FP; ‘Splashed Leather’ (fasciated) x ‘Angel Eyes’ FP (yielded 6 pods); ‘Millenium x ‘Rock and Roll’; ‘DB’ sd/lg x ‘Millenium’. NOTE: the mutant ‘DB’ began flowering in late June.
Through observation I discovered that crosses failed to take when inside temperatures were above 80ºF. After moving the jars to cooler rooms, the crosses began taking again. The flower scapes should not be in direct sun. Crosses can be accomplished at your leisure because of the absence of wind, insects, deer, and sunlight.

My crosses are always done using whole scapes for one cross. Through repetition I find characteristics that I'm striving for.

Do not harvest all the scapes from a selected hosta outside. I found that if the flowers are sterile outside, they will continue to be sterile inside and abort.

I found out through conversations with Mark Zilis and Jesse Willetts, that hosta seeds are mature 6-7 weeks after fertilization. I suggest dating your crossing tag with the date you began your cross. If using whole scapes, then date the last flower crossed on the scape.

Also take note of the photos on my website and the slide program: the flowers retain their color and stay on the pods even though the crosses were completed many weeks prior to the photos.

If you notice that the sugarwater becomes cloudy or a gel has formed at the base of the scapes, then I recommend changing containers and adding a new solution of sugarwater. Also remove 1 inch of the bottom portion of the scape.

Frozen pollen can be used to make out of season crosses. Simply remove the ripe pollen anthers from the filament using tweezers and placing them in 35mm film containers. Label and place in your freezer. Prior to crossing: label a scrap of paper with the variety; take out as many anthers as you will need. Let the anthers warm up to room temperature for at least 15 minutes and proceed to make your cross.

THIS IS NOT ROCKET SCIENCE

Bob Kuk
HYBRIDIZER'S CORNER

By
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Many people who visited our gardens this summer expressed an interest in hybridizing hostas and they had so many questions about the process that I thought it would be helpful to start a regular column in our newsletter about this subject. I've only been hybridizing hostas for about six years so I don't pretend to have all the answers but I think I have enough experience to share some information and hope other experienced hybridizers will “come to our aid” with additional insights.

Basic Horticulture 101

Hosta flowers contain male components called stamens containing a filament and an anther on which the pollen is produced. These look like a lily pad. The anther is brown in color and when the pollen is ripe, the anther appears yellow or golden. The female component is the pistil made up of stigma, style, and ovary. The pistil, which appears as a white filament with a knob on the end, is usually longer in length than the anthers. When pollen from the anthers comes in contact with the stigma end of the pistil, the pollen travels down the style to the ovary and fertilization occurs. In 3-4 days the ovary starts to swell and a seed pod is formed in which seeds will develop and mature over the next 30 days. As the seed pods age they begin to dry and eventually crack and expel the seed. As hybridizers, we collect the seed pods before they open but after the pod has matured.

(Pollination)

Getting the pollen to come into contact with the pistil can occur in an open or a closed process. Open pollination occurs when wind or insects carry the pollen which becomes attached to their bodies as they crawl or fly inside the flower. Most of these flowers are self-fertile. That is, the pollen of a given flower comes in contact with the pistil of the same flower and the result is really not a hybrid. Occasionally, pollen is moved from one hosta flower to another flower of the same plant or to the flower of a neighboring hosta plant.

Closed pollination occurs when a person intentionally moves pollen from one hosta to another hosta. Plants produced from this process are true hybrids as they bring characteristics from both the pod and pollen parents to the new plant. In closed pollination, one carefully removes the anther from a selected flower by grasping the filament below the anther with one hand and the base of the flower with the other hand. By pulling gently, the anther and filament can be removed from the flower and carefully carried to the hosta flower to be pollinated. Be careful not to touch or shake the pollen laden anther as this could cause much of the mature pollen to fall off the anther. To complete the pollination, carefully tip the anther to come into contact with the knob end (stigma) of the pistil. If the pistil is receptive, it turns yellow or gold colored from the pollen which covers her. This is often referred to as “lighting up” the pistil. If fertilization takes place, cross-pollination has been successfully completed.
CLOSING POLLINATION

In closed pollination, the hybridizer carries pollen from a selected pollen parent to the pistil of the selected pod parent. The difficulty is getting to the selected pod parent before the bees, especially bumble bees who are excellent pollinators and very early risers. To beat the bees, you have to be out in the hosta patch at the “crack of dawn.” However, let me share with you some management techniques that I’ve tried or seen used successfully.

I’m not an early riser so I built a hoop house and covered it with shade cloth end to end. There are doors at each end but everything is covered with shading material that eliminates 50 per cent of the sunlight. The first year I had my pod breeder stock in plastic pots of various sizes but experienced a huge amount of winter kill in spite of having the hoop house covered with plastic for the winter months. Since that set-back, I’ve planted my breeding stock in raised beds in part of my shade house. Covering the beds with burlap bags and/or frost blankets has eliminated the “winter kill” problem.

To control pollination, the key is the shade cloth enclosure which has eliminated nearly all insect pollination. I can go into the hoop house (I refer to it as my breeding pen) at 8:00 a.m or 9:00 a.m. and do my pollinating.

Another technique is to emasculate the flower of the pod parent that you want to pollinate. This is accomplished by checking the flower development on the pod parent hosta. You look for a closed flower that is starting to swell and appears to be ready to open the next morning. Remember, hosta flower scapes are racemes which means the flowers open starting at the bottom of the scape. Once you locate such a flower, you carefully pull open the flower bud exposing the male and female parts of the flower. You pull out all the anthers and then tear off each petal of the flower so that only the female parts of the flower remain. Be careful not to damage the ovary. The next morning that pistil should be unpollinated because there will be no flower to attract the bees.

I know of another hybridizer who takes cloth screen material and cuts it into rectangles large enough to wrap around the flower end of the hosta scape. He secures the material with spring-type clothes pins making a barrier the bees cannot penetrate. He then goes out at his pleasure, unsnaps the clothes pins, pollinates the ready flower(s) and secures the barrier again. Metal screening may be too heavy so nylon screen material will probably work the best. Even at that, you may have to stake the flower scape(s).

Are there other methods? I bet so! If you’re doing something different, email me (______) so we can all benefit from other informed sources.

NEXT TIME: POLLINATION RECORD KEEPING