Hybridizing By Observation

By James Whitely

There are many books and articles about the mixing and combining of iris chromosomes and genes, so the mechanics of those theories will not be explored here. However, I must refer to the mechanics from time to time because that is the study here, the study of recognizing what the results of hybridizing are.

After making many crosses and growing seedlings, it became evident to me that my skills in selecting parents and my concerns about chromosomes and genes and their combinations were futile. There were some nice seedlings, but I was disappointed. The reasons for failure became evident several years later. They, the chromosomes and genes, were doing their work, but my failure to observe the results as displayed in the offspring was my fault. I placed far too much emphasis on book theory about chromosomes and genes whose combinations could not be observed by the human eye. It took me 10 years to learn that lesson.

Becoming a garden and show judge for the American Iris Society was a natural event while growing iris. I didn't want to become a judge, but my wife insisted. It was the only proven way to learn how to understand the value of an iris I was observing. In hindsight, her choice helped me to serve as a judge and helped me learn to hybridize. The most important element of both is to understand the value of a plant you are looking at. The plant is the end result of the combination of genes and their hosts, the chromosomes, set in motion by the person desiring to create a better plant. But did this work? Observation is more than just looking!

So what kind of hybridizing program did I use to generate my seedlings? The first thing I did was work with plants that I could grow continuously; that is, they had to live for many

generations. The next element necessary for success was to accept the fact that I could not grow oncos or regelias or their hybrids just because I liked them. I had to work with what grew for me. Oncos live at my place no more than two years and, most of the time, for only one bloom season and then die. Regelias did much better. They thrived for several years, but then in another year or two after that were gone. Besides me, the Carl Boswells, Walt Luhin, Vernon Wood, B. Farrington and others all tried to grow oncos in greenhouses and used other means to attempt to provide a home for them, but the results were the same. However, others growing them at higher elevations were more successful at keeping them alive longer, and I noticed that those people lived above the fog and smog layers of the San Francisco Bay area. The purchase of oncos or hybrids just to get one bloom for making a ¾ bred was rewarding. I could see the bloom and have seeds for offspring. That was what I settled on for the time that oncos were available from John Holden, Luella Danielson, and David Shahak. But when the sources for oncos were gone, what was I to do then?

The answer became simple. I had to select the best parents from arilbred stock and grow them in order to make a cross and then select the best offspring and continue this routine to obtain bloom, growth, resistance to weather, substance and texture in the petals, number of blooms, branching, signals and style arms, and if I had the choice, color changes. If I observed that there was a better characteristic in the offspring, I saved that seedling. I discarded inferior seedlings regardless of how much I liked certain things about them. Otherwise, they would cause me grief and a loss of space where I could otherwise grow better seedlings.

Now here is where I depart from doing what many

growers and hybridizers do. I don't disagree with them, but I choose a different explanation of how to get to the same point. I observe 2 to 4 generations of chromosomes; to me, the rest are gone, polluted beyond recognition. I look at 2 generations only. Why? The mechanics of the genes have 2 definite rules; when they combine with another chromosome (at meiosis), they change, and that change cannot be reversed. In Bible terms, you can pollute but not purify. When you make a second cross onto that new generation, there is pollution again and so forth, making a new set of chromosomes as compared to the previous set. To bring forth a plant that is close to those you started with is close to impossible. There are dominant and recessive plants, and the offspring of the dominants are almost duplicates of the parents. It is easy to recognize the dominant one; however, the recessives take several generations to show up. But who wants to generate duplicates? We are trying to get something better. I generate seedlings; only God creates them.

Observation of the offspring helps to determine what happened inside the seeds when the pollen mixed. Did the plant come out shorter or bigger, have better bloom, or end up being a better plant? If so, then you need to select the plant that will guide you toward your goal. That is the reason to make a cross with that iris. Recessive genes take several generations of seedlings to obtain the desired plant, so selecting the seedlings to get there is hard to focus on. A re-bloomer of mine, W02-05, referred to as O-25, is a start for a reblooming seedling to get the recessive re-bloomer genes aligned. They may not make it with the seedlings chosen. Should “A” and not “F” seedling be used for the best results? Who knows? One has to choose the best seedlings to continue the task. My main point is that there are so many changes of gene alignment within 3 or 4

generations that you have to take what comes and work with it, like it or not. Book theories will not help at this time. Again, I say that these plants are what the pollen alignment brought you to, so observe them, evaluate them, study them, and live with them. It was your doing. Sometimes good and not-so-good seedlings show up. One can try again if the results are disappointing.

What about color and other bloom details? I like to think of this in human terms, as we are living examples. Namely, we have about the same number of chromosomes, and look how we humans mix. Some of us are lighter, others darker, mixed almost like water colors or dyes. If you have a better plan, that is okay, but think of it this way: it beats poking about with a burnt stick. Only through observation will you have a clue as to the changes which occurred in the new seedlings. I follow my gut feeling from there and love every last seedling.

When working with plants that have a lesser number of chromosomes, the variations in the seedlings will be less. My experience is that it requires a much more delicate evaluation (observation) of the changes. In some cases, the seedlings look much like their parents, but they are different. When you observe details long enough, changes begin to impress you.

Pod parents are more likely to have a slight advantage as to the makeup of the seedling. That is why I might chance a back cross to one of the parents. I did not make many back crosses using arilbreds because there are too many genes and chromosomes, and variation requires more land than I have to grow the seedlings on.

The late John Holden used a 2,4-D dilute solution to help incompatibility or fertility problems in some plants to set seeds, especially with wide crosses (see the article in the

1979 ASI Yearbook, pages 23-27). I tried this several times, but I could not grow the number and variety of plants to require such a treatment. The ones that I did try this method with, they caused every ovary to swell like a take. So tag carefully the ones you pollinate.

Observing first year bloom requires some training, and you must train yourself. Second year bloom will not be the same as the first year bloom. So how does one remember what a bloom looks like from one year to the next? I write down details in a notebook and take photos which help me recall the many details of each plant. It may well be that the seedling will look the same, but be aware that there is a chance that it will be just a little different. An extreme case is my arilbred, 'Masada's Glory'. It took several years of observing it for me to realize that I had only one plant, not several. When it is stable, there are still 2-3 different appearances for the bloom. At first, I separated by colors, and thought that was that. However, the next year the bloom was all mixed again. What was stable, and who was not paying attention? How big a sign did I need before I observed it correctly?

The first division of the mother rhizome must be taken as a serious activity. There are seedlings which do not like division, and that is a serious fault. We grow iris to share, and that means to divide. First, one must make sure that the tools and processing area are clean, and good lab techniques must be used to do this work. I had a seedling bloom, and it had 6 fans, so I divided it in half; one half had 2 fans, and the other half had 4. The rhizome with 2 fans was dead in 6 months. The main piece with 4 fans lasted a year, and then it died also. I cried over it for a year and still shed a tear for that loss. I never understood what caused that loss; could I have been more careful?

Speaking of division, I will never divide a rhizome to bare bones as many gardens and iris clubs practice. If the mother plant is in good health, then a reasonable amount of divisions can be removed. If the mother is not healthy, then removing only a minimal amount of increases should be taken. This helps the mother plant to be restored to good health the following year. Small, unhealthy divisions are not likely to survive and bloom for the grower. An absolute requirement for dividing is to soak all the divisions in a diluted bleach and water solution and then wash the divisions in plain water. I use 2 buckets of water, soaking the treated divisions for 15 minutes in each bucket of water to insure removal of the bleach. The iris are immersed in the water and then lifted and lowered again to cause circulation of the water. I do this every 3-5 minutes. They are then placed on drying trays for a day, then they are collected.

Spent bloom stalks are a possible source of rot in the rhizomes if they are not removed soon after bloom. The stalks contain moisture that will or could drain down into the top of the rhizome and cause rot if you have warm to hot weather in the summer. I cut them off an inch or two above the rhizome. I was alerted to this problem when I noticed my favorite hard-to-find plant looked like a shriveled potato that had been left lying in the garage for a year. Observation revealed to me that retaining the bloom stalk on the rhizome was the cause. One year in an iris field there was some kind of infestation, and about 200 iris died. The exact cause of the problem could have been bacteria. All rhizomes that were lost had the same soft, wrinkled, rotten appearance. The stalks fell over after bloom was finished. Could the losses have been averted if the stalks had been removed? Who knows?

I have tried to find a safe method for killing weeds, but

most things I have tried proved to be faulty. If you want to spray Round Up in or around the garden, do so at your own risk. It may kill mature plants or just cause the bloom to be disfigured. Young plants more likely will die. I use RONSTAR to control weeds throughout the total yard. It is manufactured by the Bayer Company and is costly but effective. It is not to be used in seed germination areas, however. Once a plant is established, it is safe to use on the ground. Perhaps one should just try using a garden hoe.

Remember, these are my personal viewpoints, and there are 10,000 other ways of doing this work.

Iris hoogiana by Tom L. Waters