

Iris Reticulata Hybrids – 6 years Later

By Alan McMurtrie P. Eng.

In the 1994 Yearbook I reported being successful in flowering Iris *sophenensis* x *danfordiae* (sxd) hybrids. Sixteen clones bloomed that year for the first time from four different crosses that had been made in 1989. They ranged in colour from light blue to dark blue, with one being violet. The clone with the most yellow influence, 89-AC-4 was pictured in the yearbook, but it was not very striking; in fact somewhat dirty looking. Most of the others had very little yellow influence. The only telltale sign of their parentage was very narrow standards, and in most cases, a hint of yellowed-green on the back of their style arms.

The most amazing thing was they were fertile!

Had I written this last year I would have told you about two second-generation (F2) *sophenensis* x *danfordiae* hybrids. This year I can report on seven, and hint about an eighth¹. In this article I will also tell you about a couple of other particularly interesting crosses, plus of course report on how the F1 *sophenensis* x *danfordiae* clones are doing.

Of the eight F2 hybrids, two were back crosses using *danfordiae* pollen. One of these, 96-BN-1, is quite lovely and different from any existing Reticulata (see photo). Seeing it has me keenly looking forward to seeing other future F2s. 96-SD-1 on the other hand simply looks more or less like a more spotted I. *danfordiae*; in that sense it's nothing special.

Interestingly, if you carefully compare 96-SD-1 to 96-BN-1 you'll probably conclude the two are identical except for most of the overall yellow colour being turned off in 96-BN-1. Both have a couple of siblings coming along; next Spring is definitely going to be interesting! Unfortunately though, when I replanted 96-SD-1 I found its main bulbs and many of its bulblets had disappeared – just like *danfordiae* has a tendency to do. Four bulblets did survive, but that means it will be a couple of years before it blooms again. One of its siblings was completely gone, main bulbs and all. I can only guess our unusually high rainfall this summer caused this, in conjunction with the fact the bulbs had never yet been replanted (which meant they were in contact with one and another, and thus any disease would likely affect them all).

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Farmers are closing a growing season marked by damp, cold weather that has forced thousands of hectares out of production and stunted crop growth and spread disease in the rest.

More than 278 mm of rain fell during May and June, the most in 160 years of keeping such records. ...farmers will have to battle an array of diseases that last winter's mild weather failed to kill off, and which have thrived in this summer's cold, damp weather.

Every major crop in Ontario has a disease running through it, mostly mould or fungus. There's blight in the potatoes, fusarium in the wheat, rust in the corn, powdery mildew in grapes, blue mould in tobacco and the ominously named sudden death syndrome in soybeans.

Surprisingly four F2 clones, each from different crosses were a similar cream to pure snow-white overall. Each had a different shade of blue on their style arms, while their style lobes were the overall flower colour. They all had varying amounts of blue veining beside their fall's ridge, with the fall blade being the overall flower colour. Clearly there is an underlying set of genes responsible for this pattern. I was particularly happy when I saw 94-HW-1 for the first time last year – it's absolutely gorgeous. It had been the first F2 to bloom. I couldn't have asked for a more stunning first F2 bloom! I had expected / "been afraid" *sophenensis*' veining would inherently be difficult to get rid of. I also wondered if I'd get a lot of "dirty" clones, given the way *danfordiae*'s yellow mixed with blue in the F1s.

96-DZ-1 is quite amazing because it's absolutely snow-white. I also like its shade of blue, plus the way the blue veins merge with very pale yellow around its fall ridge.

Reticulata Facts

- from eastern Turkey, Iran, and Caucasus mountains where it's very dry in the summer
- bloom right when the snow is melting
- best if replanted and thinned out every 2 years
- 5 years typically from seed to blooming plant
- most are $2n = 20$
- *histrioides* and *winogradowii* are $2n = 16$, but they are genetically different
- *danfordiae* and "company" are $2n = 18$

Of the remaining two F2 clones, 94-GU-1 is a small pale blue, with a bit of soft yellow influence which gives it hints of green, particularly on the fall blade. It bloomed last year and is set to bloom again next year. 95-F-1 was the clone whose bud was eaten. The only concrete fact I can tell you is its style arms are completely mauve. The portion of the fall under the style arm has some mauve veins, but you really can't conclude much from this.

My favourites of the eight are 94-HW-1, and 96-BN-1, followed by 96-DZ-1.

¹ Its tip was eaten by a bug while in bud under straw. This meant when the flower opened, its fall blade and style lobes were missing – the most important parts.

Which are your favourites?

My attempts to create an F3 by intercrossing last year's two F2s failed. Both flowers set pods but the seeds weren't solid. I had been wondering if this meant there might be a problem with the genetics, though I was able to make quite a few successful crosses with both F2's pollen. This year I had little trouble creating F3s: six of the eight F2 flowers gave a total of 98 seeds. The one successful 94-HW-1 cross had a number of seeds that were a bit poor (not counted).

I would classify my second most promising line as involving Çat x *danfordiae*: 88-AX. Like *sophenensis* x *danfordiae*, these too are fertile. Unfortunately all three clones from the lone 1988 cross have been slow to increase, so I haven't gotten a whole lot of seed from them. All three are dark red just like their Çat parent, but they have some yellow radiating out from their ridge in the area that otherwise would be white. I believe their biggest potential is in intercrossing with *sophenensis* x *danfordiae* hybrids, and it's for this reason that I call them my second most promising line.

It will likely be 3 years before I start to see hybrids between the two. It's only been in the last 3 years (including this year), that I've successfully made a concerted effort to intercross the two. An initial cross in 1995 using three sxd pollen parents failed. In 1997, one cross onto 89-F-4 worked, giving 24 seeds. A check showed none of these appear to have germinated. Two other crosses onto sxd clones didn't work that year. In the last 3 years 44 crosses have given 469 seeds.

I had hopes of seeing a backcross onto *danfordiae* this year, however it turned out to be just pure *danfordiae*. An outcross onto "Talish" did bloom, and it like 88-AX-1, is small in size. Its colour is a mixture of blue and purple shades with a number of similarly coloured large spots around its orangish ridge. The only sign of *danfordiae*'s parentage is in its very narrow standards. As expected it's sterile.

One interesting hybrid that bloomed for the first time in 1999 was 'Cantab' x *winogradowii*: 92-FB-1. It's a soft white with light blue fall blade and a yellow flush around its yellow-orange ridge. As with all *winogradowii* hybrids, it's sterile. It produces a reasonable number of bulblets, so it's increasing quite nicely.

There's a bulb being traded amongst enthusiasts as *winogradowii* Alba. It's actually a hybrid; likely with the Retic "Talish" from the Talish mountains (available from Janis Ruksans). I quite like it. The thing I want is to stress though, is that it's a hybrid, and **NOT** an Alba form of *winogradowii*. It too is sterile.

My crosses with diploid *danfordiae*, although seeming to produce good seed, have been very limited in terms of successfully producing blooming plants. I have made hundreds of crosses and produced thousands of seeds. The only cross to successfully bloom other than ones that turned out to be *danfordiae* selfs, or the F1 & F2s with *sophenensis*, or the lone Çat cross, was one onto *hyrcana* back in 1989 which produced 4 clones (out of 41 seeds). They are of interest because two have significant yellow in them. 89-A-2 has yellow that is less intense than that of *danfordiae* (interestingly the outside of its bud is cream). While 89-A-3 shows a distinct orangish cast in a wide area around its fall ridge. The importance of these is they suggest *danfordiae*'s yellow is made up of several different carotenes; not just one single yellow. Maybe one day (several generations from now), there will be an orange Reticulata, and perhaps even a pink one.

It should be noted that the yellow is showing up on the fall, and not the style arm or narrow standards.

In these two, as well as 89-A-4, where the yellow combines with *hyrcana*'s mauve the result is a greyed, or perhaps slightly muddied appearance. 89-A-4 is interesting since distinct purple tones show up in addition to blue. 89-A-1 on the other hand looks quite like *hyrcana* except it has a reasonable amount of light yellow just in what otherwise would be the white area around its ridge. Unfortunately these clones are somewhat slow to increase.

My hybridizing goal overall is to jumble things up as much as possible, and come up with some tantalisingly beautiful clones that are markedly different from anything currently available. This is more difficult than you realize since the progeny (children) typically look quite similar to their parents. Which is to say, if your parents are all similar to one-and-another, don't expect to produce anything much different. Back around 1960 E.B. Anderson created the lovely 'Katharine Hodgkin' by simply crossing *histrioides* and *winogradowii*. Unfortunately this is a dead end in spite of both parents having the same chromosome counts – the chromosomes themselves are somewhat different.

Success is a combination of good luck, knowing what you're doing, and a lot of hard work.

For those of you who haven't raised your own hybrids it's interesting to realize that you'll typically get many good performers, as well as a number of poor ones. Obviously you hope the ones that are of interest are good performers, but there may be some characteristics in the poor performers that you want to work with, particularly recessive traits, in hopes of pulling them into the progeny along with restoring hybrid vigour. It can easily take two generations before a recessive characteristic is expressed again.

Back in the 1994 Yearbook I mentioned that the next step was to build up stock of the best clones. I suggested that as a minimum it would be eight years before a clone could be introduced, and that the exact point would be dependant on the clone's actual rate of increase, as well as which market its introduced into.

Three years ago I sent Wim de Goede in Holland a number of my hybrids for testing, including some of my F1 sxd clones. Last year he returned a number of the clones. Consequently I was able to analyse their rate of increase, and put together the chart below. The prediction for this year turned out to be off, but mainly because a lot fewer bulblets were produced: only 25. I was very much impressed by the sizes of the bulbs Wim returned. The largest were giving 2 and even 3 flowers each; though the 3rd was later in the season and much smaller in size.

<u>End of:</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
Bloom-sized	3	7	12	25	108	268	825	2,437	7,077	20,950
1 year away	4	5	13	83	160	557	1,612	4,640	13,873	40,493
2 years away	5	13	83	160	557	1,612	4,640	13,873	40,493	119,185
3 years away	<u>10</u>	<u>76</u>	<u>148</u>	<u>532</u>	<u>1,504</u>	<u>4,372</u>	<u>13,048</u>	<u>38,056</u>	<u>112,108</u>	<u>329,572</u>
Total:	22	101	256	800	2,329	6,809	20,125	59,006	173,551	510,200

94-HW-1 Projected Increase If Grown In Toronto

<u>End of:</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
Bloom-sized	3	15	47	195	741	2,989	11,679	46,515	183,221	726,405
1 year away	4	10	76	228	1,084	3,876	16,292	62,220	251,228	981,764
2 years away	5	7	25	123	423	1,825	6,865	27,971	108,735	434,449
3 years away	<u>10</u>	<u>76</u>	<u>228</u>	<u>1,084</u>	<u>3,876</u>	<u>16,292</u>	<u>62,220</u>	<u>251,228</u>	<u>981,764</u>	<u>3,910,532</u>
Total:	22	108	376	1,630	6,124	24,982	97,056	387,934	1,524,948	6,053,150

94-HW-1 Projected Increase If Grown In Holland

This year I had only 306 F1 *sophenensis* x *danfordiae* blooms. That's down from last year's 340, but I'm expecting a tremendous rebound next year. The problem was quite simple: overcrowding. The solution: a five-fold increase in growing area last fall. Although I have too many bulbs to count, a sampling suggests there will be at least a three-fold increase in bloom next year.

Up until this year, total bulb counts of one specific sxd clone, 89-Q-3, matched my predicted values quite well. It had only been the larger bulbs that were not regenerating large enough to bloom. In the same area of the garden bed there were a few stragglers that had to be planted separately, since I didn't know which clone they were. Simply as a consequence of being just a few bulbs they had more room, and their large bulbs were a good normal size.

What does this mean to you? Simple: 1) that your Retics need to be replanted every 2 years, and 2) that they should be thinned out every so often. Roughly half should be moved to a new location. Or if you already have several plantings, then give them away to some friends.

Since 1994 an additional five *sophenensis* x *danfordiae* crosses have bloomed: from 1991, 1992 and 1994 seed. In total they have yielded in excess of 22 clones². One of these contains the most yellow to-date, but it's mixed with a medium blue, which like 89-AC-4, gives a slightly greyed or dirty look. Most of the *sophenensis* x *danfordiae* hybrids are quite nice, but as Wim de Goede comments, "they're just blues." This of course is in reference to the fact that there are already a number of good blues being produced cheaply in large quantities.

I feel now, as I did several years ago, that a number are particularly vibrant and strong, and consequently should be introduced into commerce. What I need is to find a commercial grower who feels similarly.

An estimate would be that I now have something in the order of 130,000 Reticulatas, with over 100,000 of those being sxd clones. Two of the best increasers, 89-Q-3 and 89-F-4, are each close to 6,000 with roughly 2/3 of those being rice-grain sized bulblets, 2/3 of the remainder being 2 years away from bloom, and 2/3 of that remainder being 1 year away.

² The original three crosses from 1989 have now themselves produced some 32 clones

Conclusion

At last I'm getting the results I had always hoped might be possible. It's been a long road getting here. Remember it takes 5 years from seed to blooming plant, and many seeds don't ever germinate. To get this far has taken 15 years. I have been extremely lucky to stumble over the *sophenensis* factor, and have the late Frank Kalich to thank for giving me *Iris sophenensis*. I hope the Çat factor proves to be almost as good, though its off to a much slower start.

My current hurdle is to develop commercial interest in my hybrids. At the same time, as I've indicated above it takes time to build up a clone's numbers.

For more information visit www.Reticulatas.com

94-HW-1: 89-Q-1 x 89-AC-4 (light blue x dark blue with marked yellow influence), its bud was pale yellow like *winogradowii*! The overall colour when it opened was cream. Its style arms were white / cream with wide greyed blue stripes running up their back! There were blue veins on the fall, but they weren't on the fall blade itself, rather up by the style arm. There was a soft yellow highlight around the end of the fall ridge. Its standards are virtually non-existent: less than 1mm wide and tapered to points, only 15 mm long. It's QUITE nice! I never would have guessed something so lovely could have resulted from this cross.

94-GU-1: 89-Q-5 x 89-Q-3 (light blue x light blue) wasn't anything special. It was light blue, with small amount of soft yellow influence, giving hints of green, particularly on the fall blade. Its form is small like my collected ANM2325 diploid *danfordiae* (vs. the typically-sized form from Ahmet Atilla). I actually prefer all of my F1 clones to this one. I hadn't expected its bulb was large enough to bloom.

94-DS-1: 89-F-1 x {self + 89-Q-2} (medium blue x light blue), cream with light blue style arms which have a greenish cast running up the centre of their back. The outer portion of the styles is white, especially in the lobe area. The lobes are large compared to typical Retics due to its *danfordiae* parentage. Its fall blade is 15 mm wide, with 5 cm between tips (equivalent to a diameter of __ cm). The fall ridge is yellow-orange, with a hint of soft yellow extending onto the forward part of the blade. There is veining beside the ridge, but it's colouring is subdued. Its standards are 2.5 mm wide x 30 mm long with a yellow stripe running down their middle.

94-AT-1: 89-Q-4 x 89-AC-4 (medium blue x dark blue with marked yellow influence), a lovely cream with light blue on the back of the styles, which changes to cream in the lobe area. The standards were uneven, with one being 1 mm in width, while the other two were only half that. They were however all 30 mm long. The fall ridge is yellow with very noticeable dark blue veining beside. The ends of the veins sweep away from the ridge but slightly less quickly than with 94-HW-1.

95-F-1: 89-AC-7 x 89-F-1 (medium blue x medium blue) unfortunately a bug got the bud tip while it was under straw, so the flower didn't look like much when it opened. The only concrete fact I can tell you is its style arms are completely mauve. The portion of the fall under the style arm has some mauve veins, but you really can't conclude much from this.

96-DZ-1: 91-FC-3 x *danfordiae* hybrid. Is this parentage correct? It looks more like two F1s intercrossed. *Danfordiae* hybrid is just a pure *danfordiae* that I raised from seed. Incredibly 94-DZ-1 is absolutely snow-white in colour. Its style arms have a light blue stripe down their back with a feathered edge. Widely spaced veins accent the fall beside its yellow ridge, highlighted by an ever so soft yellow around the end of the ridge.

96-BN-1: 89-AC-6 x *danfordiae* (medium blue x yellow), stunning! An exquisite combination of bluey-green dots and feathering on white, with a large bright yellow patch on the fall blade. The style arms have a yellow-green, to at times greyed-blue, stripe running down their back, while the style lobes have light greyed-blue veining.

94-SD-1: 89-F-2 x *danfordiae* (medium blue x yellow), looks like a very spotted *danfordiae*. The large spots are actually blue, but when they combine with *danfordiae*'s yellow they appear green. The back of its style arms are greyed green across their width; *danfordiae* on the other hand has two wide, to non-existent, dark green stripes down its style arms.