

A look backward at backcrossing

by HAROLD HOPKINS

Of plant breeders, there are at least two breeds, characterized by the spin they put on their work as they tinker, ever, with chance.

One will systematically and methodically select the genetic traits he or she wants to combine, leaving as little as possible to chance. The other will scatter pollen indiscriminately and profligately hither and yon, and hope something good comes of it or, at least, nothing evil.

Meet the gambler and the gambler. In horticulture and other pursuits where man seeks to alter his fellow organisms, there's room for both. Indeed both may be the norm, for Dame Nature is a capricious lady who makes rules, and then breaks them just to show who holds the aces.

In the late 1960s and early 1970s, I fell under the sway of several plant breeders, and soon my mind teemed with great expectations. If I'd examined the genetic odds a bit closer, I might've damped off, but in those palmy days I had roving hands. Bill Kosar of the U.S. National Arboretum was a font of breeding lore, and I edged as close as his cigar would allow. Phil Savage was turning our strange and wonderful creations, but they were away up in Michigan.

Joe McDaniel was my pied piper. He expected one and all, regardless of credentials, to grab brushes, bags, knives, and other implements and

pell-mell after him into the fray. To hang back was not only faint-hearted; it was unthinkable.

Like a two-year-old demonstrating that pots and pans are really toys, not tools, I soon found myself organizing love matches among my half-dozen magnolias, and any others within arm's reach. Among these was *Magnolia* 'Freeman,' a selection from the grex that resulted from the cross between *M. virginiana* and *M. grandiflora* that Orville Freeman originated in 1930 at the U.S. National Arboretum.

Having been told that *M. 'Freeman'* was both as stubborn and as sterile as a mule for breeding purposes, I decided to exchange pollens, anyway, between it and a disfigured, but healthy *Jocasta*, my *M. virginiana* var. *virginiana*. (the so-called northern form) across the yard. My dustings on 'Freeman' produced only aborted distortions, but the sweetbay welcomed her offspring with open stigmas, and in due time delivered a pod of sound seed. Later I learned that Joe McDaniel, as I might've expected, had already made this backcross.

Eventually I had several young plants, all distinct from each other, even as tiny seedlings, with varying mixes from the parents in leaf shape, texture, and color. Since I was not equipped to grow all to flowering size, I gave most of the plants away to people willing to make homes for them,



Flowers (l to r) of M. grandiflora and the two backcrosses of M. virginiana x M. 'Freeman'. Center flower resembles, but is smaller than M. 'Freeman.' Right flower is difficult to distinguish from M. virginiana.



Degrees of glaucous coloring on undersides of the two backcrosses are more distinct to the naked eye than shown by the camera.

including three to a regulatory colleague, John Zaic, who lives in Silver Spring, Maryland, telling him I'd like to see the plants when they reached flowering age.

In the years that followed they slipped my mind, but not John's. Several months ago he notified me that although one of the three didn't make it, the other two had grown up, were doing well, and had started flowering a few years ago. Last spring I went over to Silver Spring to have a look.

The most obviously hybrid plant is a winsome combination of *M. virginiana* and *M. 'Freeman'*. Although topped by a windstorm a few years ago, it recovered quickly and is columnar in shape (a basis for *M. 'Freeman'* selection from the original grex hybrid group). The several attending laterals that reared hydra-headed after the windstorm's top-lop are fighting each other fiercely to be the leader. Leaves are somewhat between *M. virginiana* and 'Freeman' in size, darker below than *M. virginiana* foliage but without pronounced indumentum. Its flowers, which are plentiful and continue to open over many weeks, are a similar compromise in size between *M. virginiana* and 'Freeman.'

I was surprised to see that the inner flowers tepals have adhered precisely to one of the floral habits of the hybrid pollen parent, *M. 'Freeman'*; that is, they remain closed at the tips, without reflexing, until they turn brown and fall. This is uncharacteristic of most plants of *M. grandiflora* and *M. virginiana*, which normally open fully at their peak to display their treasures to a number of pollen-eating insects. It seems to me there should be a place in many gardens for this smaller edition of *M. 'Freeman'*.

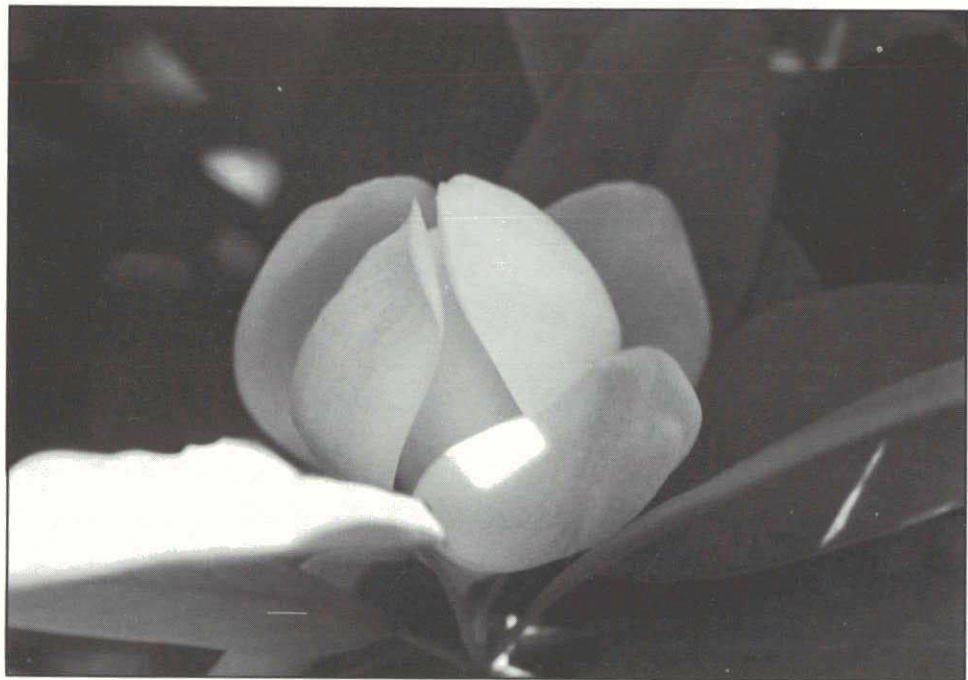
The other plant looks exactly like a rangy *M. virginiana* in the color, shape, and texture of its leaves and its flowers. I would have pegged this plant as apomictic or non-hybrid, except for some other characters that I must confess, please the heck out of me some dozen years after the fact. This rascal, as John Zaic affectionately calls each of the dozens of plants in his yard, is apparently determined to be columnar, retaining that form even with its double trunk, which begins close to the ground. Better: its foliage, unlike *M. virginiana* var. *virginiana*, is evergreen (as is that of its grandpa, the bullbay) and, according to John, has been neither sered nor damaged by the often low winter temperatures in these parts. Better yet: the branchlets arch sassily, the leaves somewhat resembling a spray of pineapple leaves, much closer-noded and denser than the northern sweetbay. This hath its rewards when breezes stir the leaves and their silvery undersides flash seductively at the beholder.

These results make me wonder idly if this product of the breeder's art could be a man-made equivalent, however unintended, of *M. virginiana* var. *australis* (the southern form), a before-one's-eyes demonstration of the magic coded into nostalgic, adventurous genes far from home, telling the little tree to shoot upward and grab its share of vital sunlight! Certainly the upsweep of the southern sweetbay and its persistent leaves — which conceal squirrels fully as well as the bullbay — are features that I well remember from my southern upbringing.

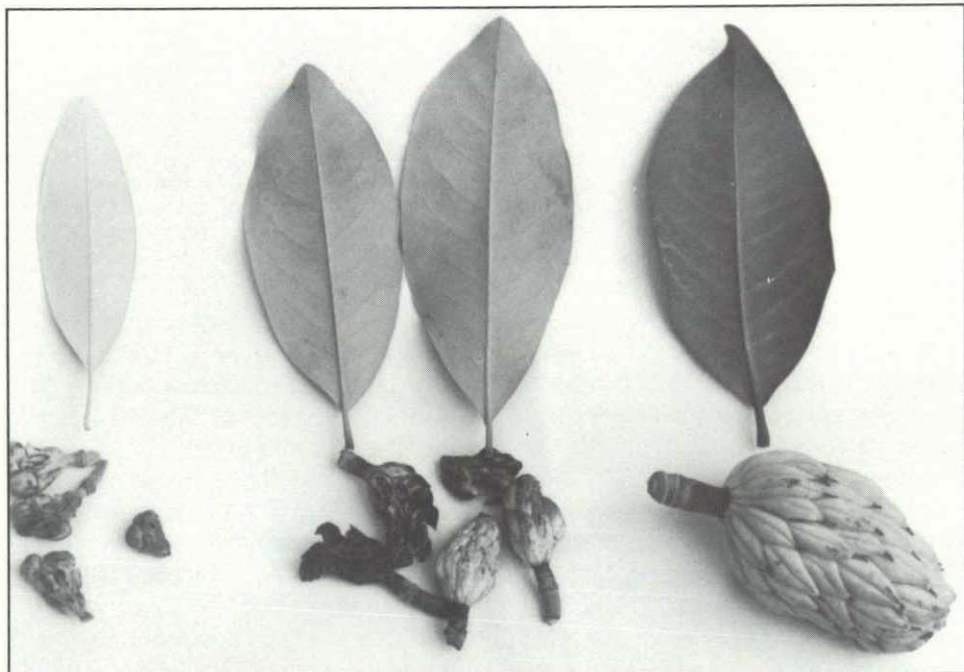
All this gumshoeing about woods colts, scientific meanderings, and homesick recombinants once more opens a breach to inject my opinion



Flower of backcross most resembling M. virginiana.



Flower of backcross most resembling M. 'Freeman,' its staminate parent.



The nubbin seedpods and leaves (l and c) are from the backcrosses respectively resembling M. virginiana and M. 'Freeman,' shown with seedpod and leaf of M. grandiflora, for comparison. Three of those at left contain one seed each. Those in center were empty.

that Joe McDaniel's piece, "Did Magnolia Grandiflora Borrow Some Genes?" (Issue No. 10), remains a classic fit to be pondered anew after 20 years. The southern forests where our

native magnolias grow next to each other are lovely, dark, and deep. And so is the mystery of their tribal relationships. ■

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