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PROPAGATING NATIVES
THE BEST MAGNOLIAS AND HOYAS
RETURN OF THE PAWPAW
WHAT AILS OUR LANDSCAPES

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Learning

DICK KEEN (BOTTOM), ROB AND MELISSA SIMPSON (TOP)

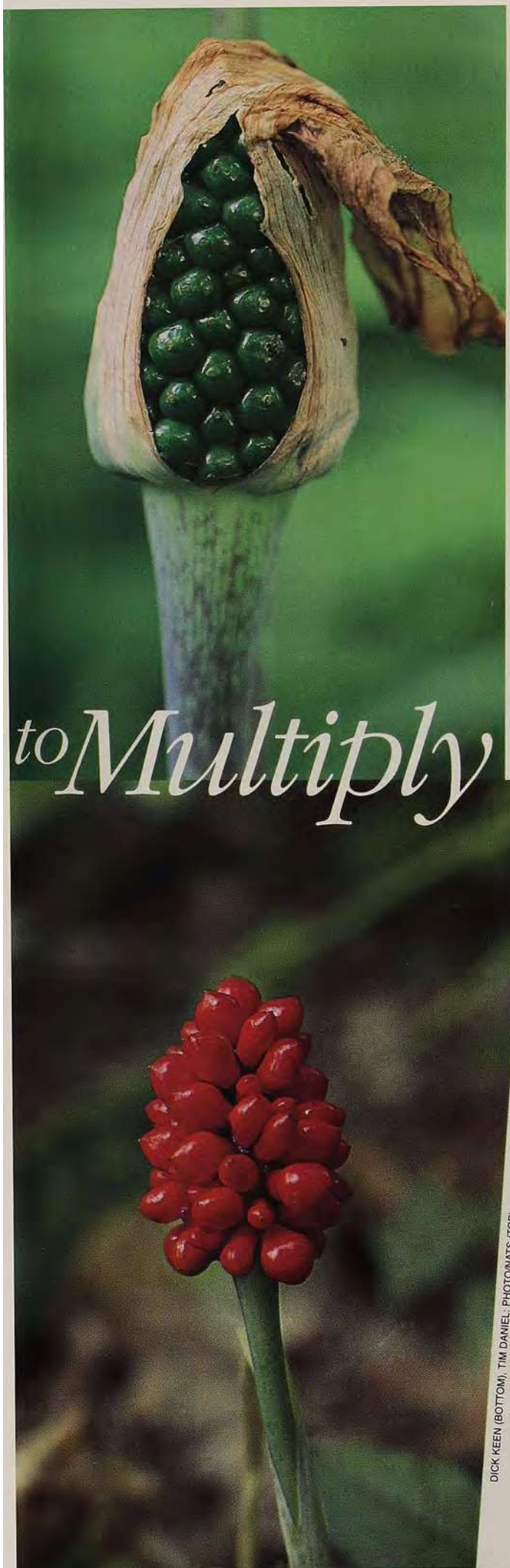
BY RICHARD DEVINE

When I was hired as head gardener of a private estate in north central Florida 18 years ago, the landscaping was somewhat formal and limited to exotic shrubs and annual bedding plants like begonias, dahlias, and impatiens. The landscape's natural upland forest backdrop of live oaks, laurel oaks, sweet gums, and pines went unnoticed by all of us. Natural landscaping was not in vogue.

Nor did there seem any need to propagate our own plants. My budget was ample, so I purchased everything as plugs or mature plants. It took too long to grow usable plants from seed, I felt, and germination was too chancy when we needed thousands of plants at one time.

What I didn't want to admit was that I still had problems. Each year I lost a lot of plants to disease. That shade-providing tree cover made it difficult to grow grass and many exotic annuals. Fungus outbreaks made it necessary to use pesticides and to replug or resod grass every year. To alleviate those problems, we constantly trimmed and thinned the trees to bring in more light. We spent large amounts of money and energy just to maintain the status quo.

About seven years ago, struggling to persevere, I began to search the horticultural literature for some answers. I found an increasing number of references suggesting that humans had gotten out of sync with the environment and that we needed to use more native plants in our landscape. Today, natives have



After Jack-in-the-pulpit blooms in spring, far left, the fertilized female, at right in bottom left photo, begins to swell with seed-bearing fruits. When they turn bright red, seed collectors know they're ready for harvest.

to Multiply

With some study and patience, you can propagate your own favorite natives.

DICK KEEN (BOTTOM), TIM DANIEL: PHOTO/NATS (TOP)

become celebrities of sorts. They've been neglected and overlooked for so long that we buy them and venerate them in gardens where they should naturally reign supreme.

Soon after I began buying native plants, I realized how many places they might be used and how many more I needed. We had room for literally thousands of wildflowers throughout our gardens, woodlands, and lanes. But many of the plants were either unavailable in nurseries or too expensive to purchase in large quantities. With two large greenhouses, we certainly had the facilities to propagate our own—it just seemed like a natural extension of growing them. So after I purchased plants, or as I tramped through the woodlands and along roadsides, I began to collect seeds and cuttings to add to our own stock.

The techniques we use to propagate native plants are no different from those used for any other plants. I learned early on, however, to familiarize myself to some degree with the life cycle of the plants to be propagated—when they set mature seed and how to recognize seeds that are ready for collecting. Much of this information was easily obtained by talking to others who shared the same interest—native plant societies, and horticulture and gardening groups—and from a number of fine books on the subject. (See "Resources," page 40.) I found that there was no substitute, however, for just traipsing around in meadows and woods and taking good field notes in the process. Good notes taken over a number of years save a lot of wasted time later, since the information gathered can be used to nar-

row down collection times.

Recognizing ripe seeds is usually—although not always—straightforward. The telltale sign of maturation tends to be a color change, with the seeds themselves turning from white or green to dark brown or black. In some plants—penstemon, lobelia, hibiscus, stokesia, iris—seed pods and capsules may turn dark brown. In others—dogwood, magnolia, red chokeberry—the fruits turn a more colorful hue. There are many wet areas near the estate, and it isn't difficult for me to pinpoint collection times for bog-loving Jack-in-the-pulpit (*Arisaema triphyllum*), whose bright red berries are visible from a considerable distance. In yet others, such as many members of the aster family (ironweed, goldenrod, Joe-pye weed), the formation of a fuzzy or silky tuft gives away their maturity. The black, swollen seed head of black-eyed Susan (*Rudbeckia hirta)* or purple coneflower (*Echinacea purpurea*) is another example of obvious change.

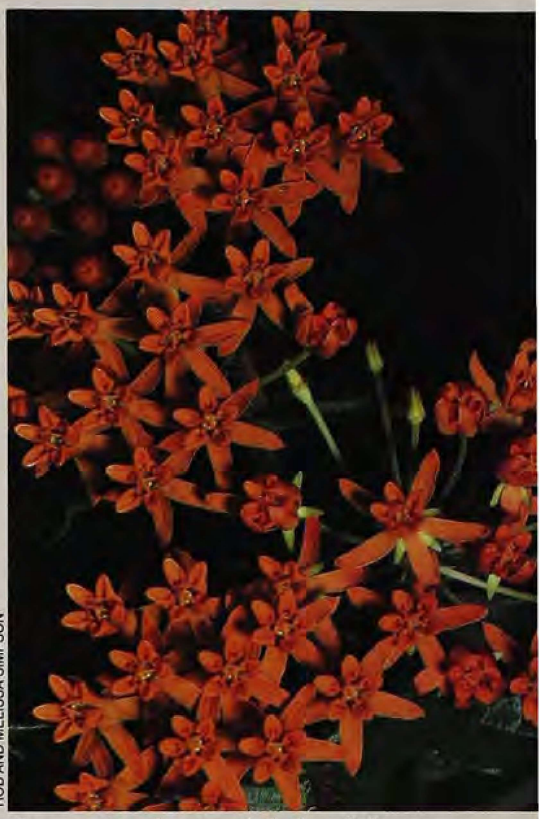
Some plants, on the other hand, hide their delicate condition rather well. Seeds of butterfly weed (*Asclepias tuberosa*) can be ripe even though the pod is still green. The only way you can tell for sure is to open the pod. If the seeds are dark brown or black, they're ready.

Some wildflowers set seed and disperse them relatively quickly, while in others, maturation seems to drag on for many months. I sometimes mark plants that develop inconspicuous seed heads with a red ribbon or flag while they're in flower as a reminder to revisit them later. If I'm not sure I will get back in time, or if I know the plant disperses its seeds explosively, I tie a paper bag over the inflorescence to catch the seeds. The maturation process of pinkroot *(Spigelia marilandica)* seeds, for instance, is famous for proceeding slowly at first and then accelerating so that the seeds are scattered when you least expect it. The first time I collected *Spigelia* seeds, I dropped the pods into a plastic cup on my desk and promptly forgot about them, assuming that they would split open and drop the seeds passively. Several days later, while I was working at one end of my desk in the quiet of morning, I became aware of a popping sound at the other end. Searching cautiously for the origin of the sound, I discovered the *Spigelia* seeds spraying all over the room! Now when I return to the greenhouse with seed capsules that are turning brown but aren't quite ready to split open, I hang them on the wall in a paper bag until they finish ripening.

Larger seeds, such as those of stokesia, hibiscus, and iris, are easy to remove from their capsules by hand. Smaller seeds encased in tough capsules, such as penstemon or verbascum, can be dislodged by crushing them. Other tiny seeds, such as those of columbine or salvia, are hard to retrieve by hand but fall out easily when shaken vigorously in a paper bag.

Any chaff can be removed by running the seeds through a sieve, gently blowing air over them, or winnowing—pouring the mixture from container to container under a light fan or breeze. More often than not, though, I skip this step, since I find it easier—and usually no more hazardous to the germination process—to scatter seeds and chaff together on the soil surface.

When seeds have a fleshy covering, like those of Jack-in-the-pulpit, it's best to remove it. This pulp can delay germination up to several months and make the fruits a target for mold. We usually soak the fruits overnight and then remove any clinging pulp under running water. Before you clean seeds in this manner, however, it's good to know how big they are. The first time I cleaned the seeds of firebush *(Hamelia patens)* this way, I hadn't been able to find information on their size. By the time I macerated the fruit and ran it through a sieve, the seeds had disappeared.



ROB AND MELISSA SIMPSON

PRISCILLA CONNELL: PHOTO/NATS

Our native dogwood, below left, produces seeds with a pulpy outer covering that should be removed before storing or sowing them. Butterfly weed, above, can have ripe seeds while its pod is still green. Once the dry brown pods split open, right, the seeds are scattered to the winds.

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I finally isolated the one-third-millimeter black seeds by mashing the purple fruit on a paper towel, spreading it out with my finger, and picking through it with the aid of a magnifying lens.

Some growers recommend removing these small seeds by running the fruit through a kitchen blender and running the resulting concoction through a sieve, or soaking the seeds in warm water and yeast that starts the fruit fermenting. I've never had to resort to such brews, however, and for small seed quantities I often just remove the pulp by hand.

While many seeds are easily germinated, others have complex chemical or physical barriers that prevent their germinating at the wrong time. The breakdown of those barriers is synchronized to seasonal cycles so that seedlings will have the longest possible time to adapt to their environment before cold weather sets it. The seeds of native plants are likely to have more complicated barriers than commercially sold seeds, which are bred to be easy to grow.

The easiest way to break these barriers is to let nature do the work. Seeds sown in cold frames in fall will germinate in their own time after going through the proper sequence of warm and cold. We use the smaller of our two greenhouses as a cold frame of sorts, growing in it only those plants that can withstand ambient temperatures (and we lower winter fuel bills in the bargain).

If you're impatient and don't want to wait a year or more for a seed to germinate, you can sometimes speed up the process. Hard seed coats such as those of blue star *(Amsonia tabernaemontana)*, iris, and coontie *(Zamia pumila)*, which slow the penetration of water, can be scarified—nicked or punctured with a knife or other sharp tool, or rubbed against sandpaper.

Coontie, an attractive and versatile evergreen shrub, is a doubly hard nut to crack. Each seed, originally attached to a cone-shaped structure that emerges from the plant's center, is encased in a tough outer membrane and a hard inner shell. Under natural conditions it takes many months for water to penetrate the seed coat. With information provided by a neighbor who teaches biology at a nearby middle school, our grounds staff germinated hundreds of coontie seeds in just a few weeks by first peeling off the outer layer and then snipping off the tip of the inner shell with pruning shears.

Similarly, the germination time of blue star can be reduced from four months or more to about one month by first breaking off the tip of the seed coat and then soaking the seeds overnight in water.

Not all seeds need such elaborate preparation; just filing a notch in the coat may be all that's necessary to allow water to penetrate to the embryo.

Exposing seeds to an artificial winter or summer to hasten germination is called stratification, after an old English practice of layering the seeds in flats outdoors. After removing the pulpy outer covering from dogwood *(Cornus florida)* and southern magnolia *(Magnolia grandiflora)* seeds, we mix them with moist sand and put them in a vial or plastic bag and refrigerate them for 90 to 120 days. Once they've had their required cold period, there's little to stop germination: We've had New Jersey tea *(Ceanothus americana)* seeds germinate in vials stored in the refrigerator because we waited too long to sow them. Keep in mind that seeds from

the same species grown in different parts of its natural range may vary slightly in the time that they need to be exposed to cold. So especially if you'll be letting nature do your stratifying for you, it's best to collect seed locally.

Some plants need both warm and cold treatments. Seeds of fringe trees *(Chionanthus virginicus)* develop strong root radicles during warm stratification and produce stems during cold treatment.

Lengthy dry storage at room temperature will lower the germination rate for most seeds, so if we won't be sowing them for more than a month, we clean and dry them and store them in the refrigerator in vials or plastic bags. We've found plastic film containers excellent for storage of small seeds and Zip-Loc bags for larger seeds. Some books suggest including a small amount of silica gel or powdered milk in cheesecloth to absorb any moisture, but unless you plan to store the seeds for a long time, I don't think that's necessary.

In nature, the pulp on fleshy fruit such as hollies, Jack-in-the-pulpit, or chokeberry *(Aronia arbutifolia)* serves to keep the seed somewhat moist prior to germination, so while we remove the pulp to prevent mold, we store these seeds in moist sphagnum moss in a plastic container. Dogwood and southern magnolia, however, have hard shells under their pulp, and we store them dry like most other seeds.

Here in Florida, most seeds can be sown outdoors almost year-round without any danger. Depending on weather conditions, and whether we have enough seeds to tolerate a lower germination rate, we often sow seeds directly where they're going to grow, such as in our meadow. In other instances, we scatter the seeds thinly on soilless mixes spread one-and-a-half to two inches thick in 1-by-2-foot flats, and then spray them with water to achieve good contact. Very tiny seeds generally don't require covering. The general rule is to cover larger seeds to a depth four times their width, but the depth isn't critical as long as they're covered. We label each flat with the species and date of sowing (we keep more detailed records in a computer), then cover each with a sheet of glass to keep the soil surface from drying out.

Most of the wildflower seeds germinate in one to three weeks. Shrubs and trees can take considerably longer. Don't give up hope, and don't throw away the flat too soon. One group of American holly seedlings popped up six months after we planted them, just when I had decided nothing was ever going to happen.

Once the seedlings are up, we fertilize them with a dilute solution of a balanced fertilizer, such as 20-20-20. Although it's best to transplant them when the first set of true leaves are expanding, I find more often than not that we don't get to them until they've become a tangled mess that has to be pulled apart for planting. Last spring we had good germination with cardinal flower *(Lobelia cardinalis)*—so good that the plants in one of the flats couldn't be separated. Rather than throw them out or spend hours separating them, I slipped the whole mass from the flat and pressed it down into the wet soil of a lowland. Most of them rooted and are now flowering. Seedlings are a lot tougher than most people give them credit for. Some seem to do quite well even with rough treatment, as long as they receive enough moisture while they're getting established.

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Crinum lilies, below, form large clumps and can be easily reproduced by division. The author found that cardinal flower, blooming above and in seed at right, germinated abundantly.

JESSIE M. HARRIS

Another excellent way to propagate some plants is through stem and root cuttings. We take cuttings quite often when we only need a few plants or when they root relatively easily. Cuttings will give you a mature plant faster than seeds and will also produce an exact replica of a special parent plant. Deciding whether to take root cuttings or stem cuttings and, if the latter, whether to take softwood, semihardwood, or hardwood cuttings, takes

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some research and experience. Generally, softwood cuttings are those taken in spring, semi-hardwood cuttings are those taken in summer, and hardwood cuttings from deciduous shrubs and trees are those obtained in fall when the plant is dormant. Many needle-leaved evergreens can be rooted from stem cuttings taken in late fall. Source books on propagation and just plain trial and error will show you the best time to take cuttings of a particular species in your area.

Sanitation is crucial when taking cuttings. All equipment should be thoroughly cleaned with a 10-percent bleach solution and disinfected again between cuttings. Using pruning shears, we take our cuttings early in the morning when the air is cool and still humid, and usually in the early spring or late fall, again because temperatures are cooler. We pop the cuttings in a plastic bag to keep them moist until we get back to the greenhouse, where we cut the stem again, this time using a razor blade and on a slant to expose as much of the stem's surface area as possible. Now working with a cutting three to four inches long, we remove all the flower buds and all the leaves on the bottom third of the stem. If the plant has large leaves, as do *Leucothoe axillaris, Hamelia patens,* and many rhododendrons, we cut off half of each of the remaining two to three leaves to prevent excess water loss through transpiration. This also keeps the leaves from touching each other, which might spread disease.

Depending upon how easily a particular species roots, we treat the cut end of the cutting with one of a number of different strengths of rooting hormone. Root-Tone and Hormodin, both dry mixes of hormone in talc, are the two we use most often. There are also rooting compounds in liquid form, which we have never tried although I hear they work well. Some plants, such as coral honeysuckle *(Lonicera sempervirens),* root easily even with dilute concentrations; in fact, we've rooted them in water. Others, such as leucothoe, require stronger doses, and a few, such as fringe tree, are virtually impossible to root from cuttings.

We next stick the cutting into a soilless mix, after making a hole for it with a finger so all the hormone powder won't be knocked off. I don't think the type of soilless mix matters so much as that it is well-drained and free of contaminants. We use a mix of half peat and half perlite; peat and sand works fine, too. We've also had excellent results with Pro Mix, a commercial product containing predominantly peat and perlite that's used extensively in the nursery trade for growing bedding plants.

To give the cuttings a moist environment until roots form, we put the flat of cuttings in a 3-by-8-foot tent made of 1-by-2-inch lumber, covered with translucent polyethylene sheeting. If we're trying to root just a few cuttings, a styrofoam cooler covered with clear plastic sheeting works well. Individual pots can be covered with large freezer bags held away from the plant with sticks and secured at the bottom of the pot with a rubber band. Maintaining high humidity is important, however you do it, since water loss is a new cutting's biggest enemy. The establishment of a good root system can take a couple of months or more.

When thinking about propagating herbaceous perennial natives, don't forget division just because it's easy! Just as with

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ANITA SABARESE

Swamp mallow, in bloom at top, produces seeds, above, that clearly darken when ripe and are easy to remove from its pods.

the exotic ornamentals we grow in our perennial beds, it not only increases the number of individual plants in our collection but also rejuvenates older plants that are too crowded. Divisions also flower sooner than seedlings. Our stock of blue-eyed grass *(Sisyrinchium atlanticum)* has increased from 80 original plants to more than 1,000 in just a few years simply by our pulling them up in the fall, separating the clumps, and replanting them. We also use this method on Stokes' aster *(Stokesia laevis)*, orange coneflower *(Rudbeckia fulgida)*, long-leaf coreopsis *(Coreopsis gladiata)*, crinum lilies *(Crinum americanum)*, and many others.

We try to divide the plants when they're dormant or at least a good long time before they're ready to bloom—either early spring for fall bloomers or early fall for spring bloomers. All you need is a sharp knife, spade, or shovel. Many times, plants can be pulled apart by hand. Just make sure that each division has enough roots and eyes to survive on its own. The divisions can be potted, as we do with orange coneflowers (you can give them more attention as their roots get established) or replanted as we do with the blue-eyed grass (there are too many of them to pot and we know they establish well with a minimum of attention). Some plants, such as columbine, are easily disturbed by this process so they have to be handled carefully. (This is another instance where you have to get to know the individual plant, through reference books or personal experience.) The divisions are then watered and mulched, which keeps moisture at their roots and prevents overheating in summer. With the sandy soils we have in Florida, we have to check them often to make sure they stay moist until they're established.

This narrative is in no way meant to be a thorough primer on plant propagation. Rather, it's intended to spark an interest in a fascinating and complicated biological process. Propagating native plants growing nearby—and not endangered—is fun, economical, and a way to obtain plants that may not be readily available from nurseries. But above all, it's an educational process that brings us closer to the natural world that surrounds us.

Richard Devine is a free-lance writer and the horticulturist for a private estate. He lives in Crystal River, Florida.

RESOURCES

Richard Devine recommends the following references:

Collecting, Processing, and Germinating Seeds of Wildland Plants by James A. and Cheryl G. Young. AHS member price: $22.50.

Growing and Propagating Showy Native Woody Plants by Richard A. Bir. AHS member price: $26.95.

Growing and Propagating Wildflowers by Harry Phillips. AHS member price: $15.

Seeds of Woody Plants in North America by James A. and Cheryl G. Young. AHS member price: $44.95.

See ordering information on page 17.