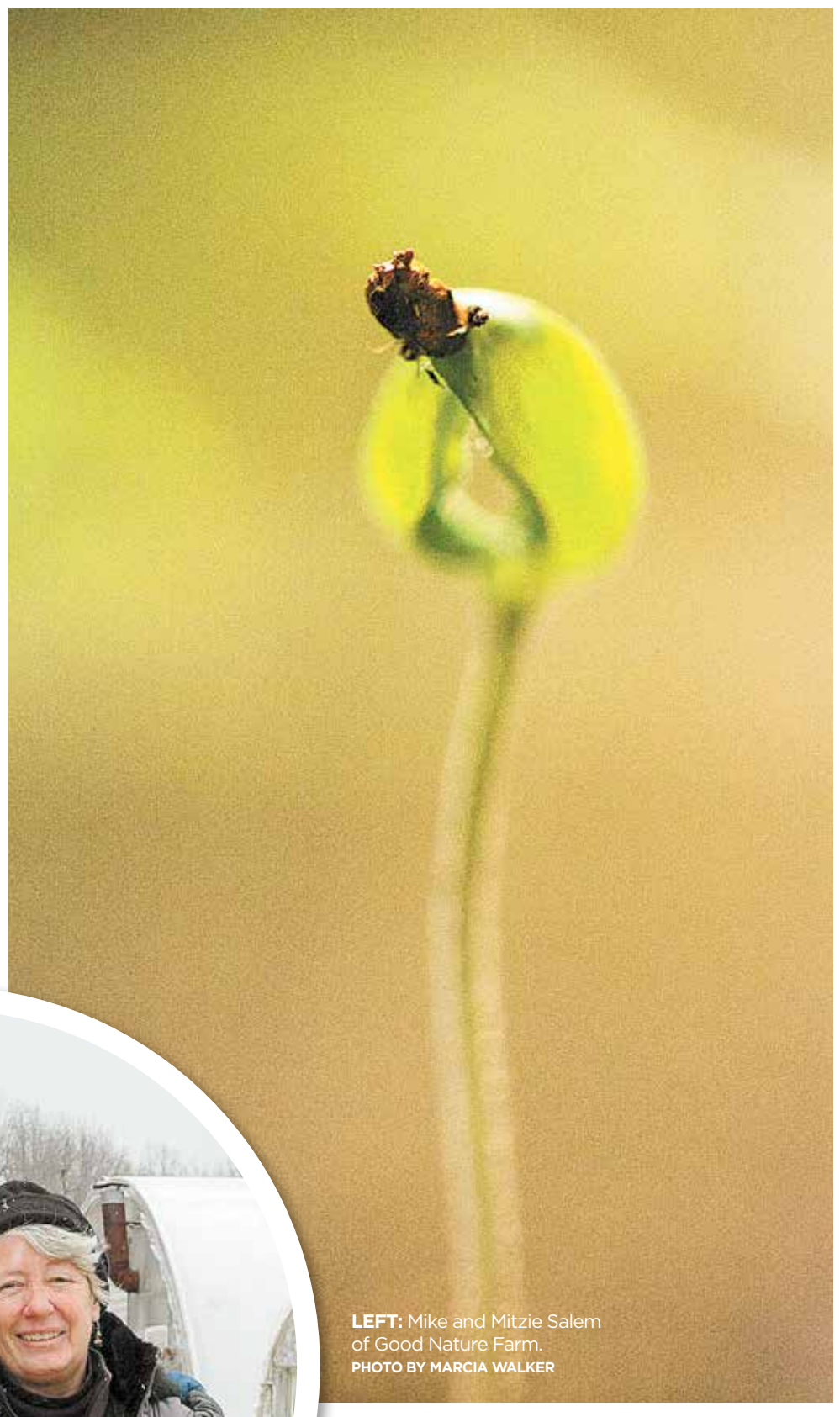
Seeds of Thought

Greenhouse experts offer advice for growing indoors

By Shawndra Miller



LEFT: Mike and Mitzie Salem of Good Nature Farm.
PHOTO BY MARCIA WALKER

Raising plants in a greenhouse holds certain appeal for hobbyist and commercial growers alike. Whether used as an early start and late finish for produce, a setup for bedding plants or a haven for specimen plants year-round, a greenhouse can be ideal.

Free-standing, season-extending structures range from the high-end glazed window variety to a simple hoop house made from polyvinyl chloride (PVC) piping and plastic sheeting, with gradations in between. Depending on the grower's needs, a solarium attached to a home is an attractive option because it can serve the dual purpose of both growing and living space.

Regardless of which type they choose, newcomers to the world of hothouse growing often envision such a structure as a solution to many typical cultivation concerns. After all, the plants are protected from the elements, ensconced in a climate-controlled environment. What could be better?

But the reality is typically more complex than beginners imagine, says Mike Salem of Freetown's Good Nature Farm. He and his wife, Mitzie, specialize in greenhouse-grown bedding plants, perennials, annuals, vegetable starts and hanging baskets, over three-fourths of which they start from seed.

There's a lot to factor in when considering a greenhouse: site, size, heating and ventilation. And that's not even taking into account the nuts and bolts of the growing medium, irrigation, fertilization and even pest/disease control.

"Retailers thrive on that 'easy' idea," says Salem. But a greenhouse is actually a "wonderful place for insects and disease." That's because they typically house large groupings of one type of plant. Coupling a monoculture situation with an environment that never gets cold enough to kill off pests, it's easy to see why a resident population might take hold.

As far as siting, generally the roofline should run east to west to capture the most light. If the structure is an addition to a home, south-facing is best. In either case, there may be trees or other buildings that block the sun.

But once location is determined, Salem says temperature control is the thing that requires closest monitoring. It's also the hardest thing to get right. "Greenhouses are great at gathering heat during the day but great at losing heat during the night," he explains. In winter and early spring, the nights are cold but days are often sunny. So the thermometer inside the structure can fluctuate wildly, while many young plants are only happy within a narrow temperature range.

Common choices for heating include propane, portable electric heaters and hurricane lanterns. Though a heat source can cost as much as the structure itself, dependable heating is a key investment. A backup generator and temperature alarms make for an even safer bet.

Ventilation must also be a priority, says Salem. That's because even on the coldest days, an airtight greenhouse can reach 90 degrees if the sun is beating down. That spells disaster for the plants.

It's a common scenario for startup growers or hobbyists, he says: "On a nice day in spring, you get ready to leave the house for your day job. You get the greenhouse all buttoned up, nice and tight. But if no one's there to open the door at 1 (p.m.) or so, you're going to cook everything."

Some greenhouses have an auto-venting system with a sensor for determining when the temperature climbs. While Salem thinks these mechanisms are terrific (though expensive), anything with moving parts is likely to pose a problem eventually. The same goes for exhaust fans. "You've just got to be handy," he stresses. The chief advantage of a mechanical ventilation system

Getting Started

» **To purchase readymade greenhouses or kits:** FarmTek (farmtek.com) and Harnois (harnois.com) are two reputable online sources.

» **To build a hoop house:** Building a hoop house with a 2-by-4 base and PVC piping is a fairly simple prospect. Be sure to get actual greenhouse plastic, which is very heavy and infrared-treated so it won't break down in sunlight as fast as regular clear plastic.

» **To cut costs:** Stout recommends talking with local greenhouse growers to find out if they plan to switch out their plastic. If you are installing a 10-foot greenhouse, and your contact is pulling hundreds of feet of plastic because of a few tears, you're sure to find a decent swatch of the material that you can use for a couple of years.

» **When to enlist a professional**: If you need a greenhouse strong enough for snow load, you may require a professional's design assessment. Alternatively, you must be available to rake snow off the structure (or only use it later in the season when snows are less frequent).

"You've just got to be handy."

—MIKE SALEM

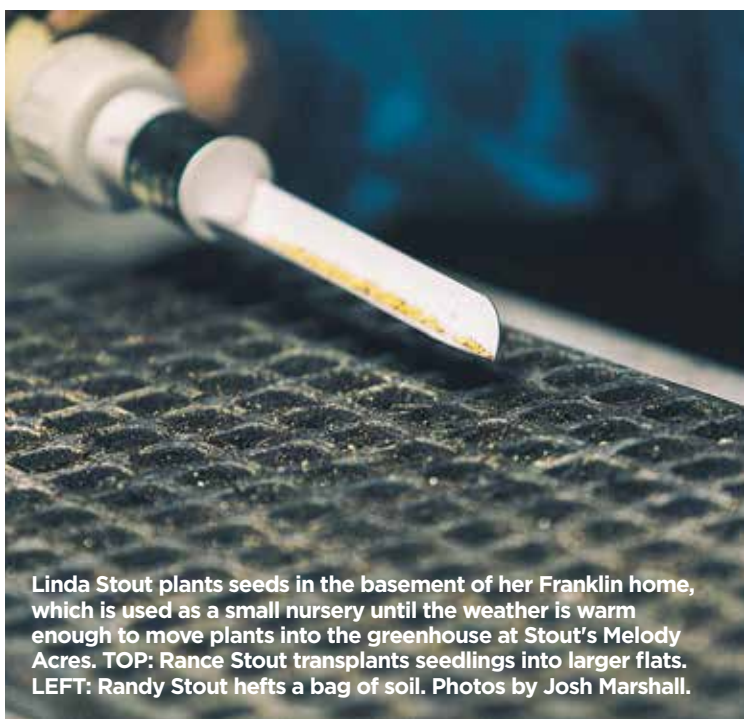
is greater control over growing conditions.

If a greenhouse is intended for year-round use, the equipment must be powerful enough to manage ventilating during the hottest months of the year.

Less controlled but cheaper is a passive ventilation system. This type of setup typically relies on air movement created by a series of vents along the roof and walls. As the greenhouse heats, the warmer air rises to escape through the roofline vents, creating a vacuum that pulls cooler air into the structure through the vents located near the ground. Another passive option involves roll-up sides, which make for additional ventilation and enable the greenhouse to be used into the summer months as well.

Despite the apparent finicky nature of greenhouse-grown plants, one Johnson County farmer says he has found a way around these narrow temperature controls.

Randy Stout, of Stout's Melody Acres near Franklin, says he rarely heats his 17,000 square feet of greenhouse space, where he and his wife, Linda, raise vegetable starts and annual flowers for sale at farmers markets. The six greenhouses also hold 40,000 tomato plants, 60,000 pepper plants and other seedlings. Some are grown to maturity right there in the greenhouse, while others are planted out on the farm that's been in the Stout family since 1918.



Linda Stout plants seeds in the basement of her Franklin home, which is used as a small nursery until the weather is warm enough to move plants into the greenhouse at Stout's Melody Acres. TOP: Rance Stout transplants seedlings into larger flats. LEFT: Randy Stout hefts a bag of soil. Photos by Josh Marshall.

Stout explains that when they started, they kept the greenhouse thermostat at 65 degrees at night. "We started running the math, and we couldn't justify the heating cost for these plants," he says. "The markup wasn't there for us." He began playing with the heat, and by trial and error found that he could get away with temps much lower than commonly recommended. He schedules two extra weeks for his early crops to make up for the slower growth rates.

The couple gets the seed beds off to a good start by propagating indoors where it's warm. Once sprouted, the seedlings are moved to the greenhouse. Stout finds that heat is only necessary when bedding plants are in the greenhouse — and even then, he aims for a frigid 40 degrees.

"All the literature will tell you that you'll have tall, leggy, spindly plants because of such cool conditions," he says. "I think it's because of our organic fertilization program that we have such healthy plants."

On the cooling side, he keeps the exhaust fans switched off until the internal temperature reaches 90 degrees in early spring when nights are cool. "Since we're not heating as much at night," he notes, "we want to store heat during the day."

In his operation, it's not temperature control but fertilization and irrigation that are most closely monitored. In the early days of Melody Acres, all plants received regular doses of commercial fertilizers. But Stout ended up burning tender plants, and he found that going organic greatly simplified his program. He uses fish

emulsion in water, feeding each plant every time it gets a drink — which only happens "right at the point where it starts to wilt," an exacting skill.

"With organic fertilizers, you don't have to worry about the roots or foliage on these little plants burning," he says. "You can use the same fertilizer on the entire greenhouse."

As a bonus, he finds he doesn't have to spray for insects or fungus in the greenhouse, because "a healthy plant will fight these off naturally."

But even before they hit the greenhouse, the plants must be germinated carefully. Growers can get plants off to a good start by using a sterile, light mix and planting only in new or sanitized containers.

While some flowers require light to germinate, other seeds require darkness. Some do best with presoaking. Most prefer 70 to 75 degrees for germination, which is why the Stouts do this fastidious work indoors — even heated greenhouses dip below that during the cold nights of winter and early spring.

Seedlings are generally started four to 12 weeks before the last spring frost. The exact timing depending on factors like cold-hardiness, number of days until seedlings emerge and time from germination to bloom. For example, marigold seeds germinate quickly, and it takes about 10 weeks from germination date to get them to the bloom stage. To have marigolds in time for an April 21 sale, Stout says, you simply back up by 10 weeks and plant around Feb. 10.

Meanwhile the seeds of certain other plants, such as coleus, take two to three weeks to sprout, so that must be factored into the equation. Regardless of the formula, successive sowings will enable a continuous stock of plants to sell or plant.

At Good Nature Farm, early March is when the Salems begin sowing their seeds. To avoid chilling them during irrigation, Salem has developed a system for watering the flats. "In March the water's really cold out of the tap, so we make a little bath for our seedlings." Trays of water are exposed to the sun to warm them up, and the seedlings are given subterranean water, nothing overhead.

This practice also protects against "damping off," which the small plants are susceptible to in cool, damp conditions. It's a fungal issue that can cause the overnight collapse of entire flats of seedlings. When it happens, there's nothing to do but start over.

Marigolds begin to grow.

Melody Acres
PHOTO BY JOSH MARSHALL

No matter what techniques are used within the greenhouse, one key thing must not be overlooked for those expecting to sell their product. "Figure out your market," says Salem. That will determine what size greenhouse is required and what to grow within its walls.

With all these considerations it's no wonder he advises consulting with an expert before either building or buying a greenhouse. For reference he recommends the Ball RedBook, Volumes 1 and 2, an industry standard since 1932, now in its 18th edition. The Purdue Extension Service can connect new growers with a horticulturalist, but he also advises connecting with someone in the industry. "The best thing you can do is make friends with someone's that successful," he says. "Come talk to me or come talk to someone who's been doing this for a while. *FI