

You may be surprised to learn how many things you're already doing in your greenhouse that are sustainable.

8 steps to take to become sustainable

GROWERS MAY CHOOSE TO IMPLEMENT SUSTAINABILITY practices without becoming formally certified. However, if you choose to have your operation certified sustainable through VeriFlora or MPS, you will need to follow guidelines and maintain documentation of your company's sustainability practices.

As defined in our first article (**GMPRO** October, Page 43), any greenhouse operation that aims to reduce environmental degradation, maintain agricultural productivity, promote economic viability, conserve resources and energy and maintain stable communities and quality of life is practicing sustainable production. Most greenhouse operators are already practicing these principles. However, there is always room for improvement, especially with the many environmental, economic and energy challenges growers are facing.

Once you've made the decision to grow sustainably, the first step is to conduct a sustainability audit. An

audit may cover these questions:

- Which of your current practices are already sustainable?
- What changes will be required due to federal, state and/or municipal legislation?
- Which changes could be made with relatively little investment of time and/or money?
- Which changes would actually save you time and/or money?
- Which changes will require large capital investment and/or significant time to implement?

8 STEPS TO SUSTAINABILITY

1. Save energy.

Increasing the fuel efficiency of your greenhouse operation is a good first step toward sustainability. Techniques vary depending on existing structures and heating systems and the amount of money available.

Some inexpensive methods of increasing energy efficiency include regularly servicing and maintaining heating and cooling systems, supplemental lights and energy curtains,

sealing cracks or tears in glazing and around doors and vents and insulating heating pipes. Since North-facing greenhouse walls receive minimal light, consider insulating the lower part or the entire wall. Consider switching to better heat-retention glazing, installing energy curtains or changing to locally available fuel sources or one produced from waste materials.

2. Lower your carbon footprint.

If you're interested in reducing your plant production carbon footprint, first calculate how much fuel is used. This includes the fuel for heating the greenhouse and the fuel used for shipping during every plant stage, along with the fuel used to manufacture and ship the containers, fertilizers and chemicals.

There's no easy method for calculating the carbon footprint of your business and especially for each crop produced. The best thing is to make smart, conscientious choices to try to reduce fuel consumption for each plant.

3. Conserve water.

To manage water sustainably, monitor and record the amount of water used onsite. This can be done



An inexpensive method of increasing greenhouse energy efficiency is sealing cracks in glazing and insulating heating pipes.



North-facing greenhouse walls that receive a minimal amount of light can be insulated to reduce heat loss.

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by installing a flow meter in the irrigation line.

Another good way to conserve water is to use an irrigation system that applies water directly to the growing substrate. Drip irrigation, ebb-and-flow benches, flood-floor systems and trough irrigation are all more sustainable than handwatering because water is applied directly to the substrate. You can further increase irrigation efficiency by quantitatively measuring plant or soil water status to decide when to water plants.

You can also improve the quality of water leaving your property by recycling water. Recycling can be built into your production system by using subirrigation. Precautions should be taken to reduce the risk of spreading plant pathogens through reused water if a recycling system is installed.

Another option for reducing the amount of fertilizers and chemicals leaving a greenhouse is to not over-irrigate plants. Using cyclic irrigation or moisture-sensor automated irrigation reduces or eliminates leaching.

A change in irrigation practices may also require a change in fertilization practices. Using subirrigation or a system that reduces or eliminates leaching will require a reduction in the fertilizer rate delivered to the substrate.

4. Practice good insect and disease management.

Adopting sustainable insect and disease control doesn't necessarily mean eliminating traditional pesticides. Integrated pest management is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices such as weekly scouting and using sticky cards to monitor pest populations. IPM programs use current, comprehensive information on pest life cycles and their interaction with the environment. This information, in combination with available pest-control methods, is used to manage pest damage by the most economical



Installing energy curtains can improve greenhouse energy efficiency and lower the overall carbon footprint of each plant.

means, and with the least possible hazard to people, property and the environment.

Biological controls also lend themselves to high-traffic retail areas that make it difficult to spray or where even short restricted-entry interval periods are unacceptable.

5. Watch containers, packaging and waste management.

More of the materials thrown in greenhouse trash bins are recyclable. A key effort in sustainable waste management is to try to reduce the number of plastic pots discarded in landfills.

Biodegradable or sustainable alternatives include paper, fiber, rice hulls, peat, straw, coir or processed cow manure pots. Not all containers biodegrade quickly, and some may actually degrade too quickly, especially for crops that have prolonged production cycles. Before switching over all production from plastic to biodegradable containers, try them on a small portion of your crop. This will help ensure that the containers work well with the crops under your specific conditions.

Try to reduce the amount of plastic or nonbiodegradable shipping materials. Another way to reduce the amount of garbage leaving

your property is to compost leftover substrate and plant waste. If you operate a garden center, consider allowing customers to bring back containers for recycling and garden waste for composting. Some retailers have also been successful selling processed compost back to customers to use in their own yards.

Recycling discarded plastics from greenhouse coverings and containers is another way to improve waste management sustainability. More states are implementing plastic recycling programs that may include agricultural plastics.

6. Choose the best plants.

One often overlooked aspect of sustainability is plant selection. When choosing which plants to grow, consider where the finished plants will be used. Choose plants

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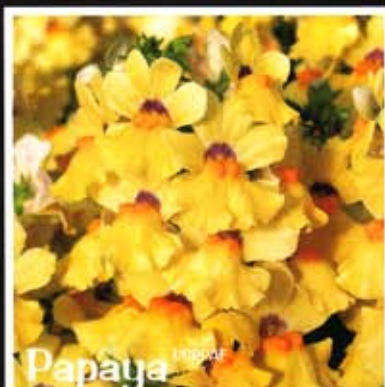
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that need minimal inputs after planting.

7. Find renewable substrates.

Potted plant producers should try to find long-term, renewable replacements for peat moss where possible.

Coir has similar physical properties compared to peat. Ground rice hulls may also be used to replace peat. Researchers at the University of Padova in Italy and the University of Arkansas recently reported that ground and screened rice hulls to a particle size of 1-2 millimeters have physical properties similar to peat. Ground rice hulls have a lower water-holding capacity than peat.

8. Create community and social sustainability.

Sustainable growing operations also promote the community within and around the greenhouse. Employees should be assured that the greenhouse is a safe working environment. In addition, the community beyond the greenhouse can be supported by hiring qualified local citizens and purchasing local materials when possible.

Rather than discard unsold plant material, it can be donated for plantings in local parks, adopt-a-spot, road medians, schools and community centers. This reduces the amount of waste that enters the landfill, makes your business a steward of the community and increases the quality of life for its citizens.

Where to start

Having evaluated your operation, now you can decide which areas to address and which to change first. Some changes may be implemented quickly with minimal financial investment. Next, address those issues that may become legally required in the future.

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