

structures & equipment

By Beth Meneghini
and Andrew Wagner

Trends in Greenhouses: It All Comes Down to Energy

As growers battle high energy costs and a fizzling economy, innovation and automation are helping greenhouse operations through the tough times.

For almost a decade, greenhouse growers have been riding the wave of a good economy. Home gardeners and retailers alike were spending money, and lots of it, on all things green. To meet the increased demand for plant material and floral products, growers were retrofitting, expanding and just plain building to keep up with the demand. As a result, greenhouse manufacturers and equipment suppliers were taking more orders than ever before.

But over the past year, the economy has taken a bit of a turn. Consumers are spending less and retailers are cautious.

Add to the economic slowdown an energy crisis and heating bills five times what they were just one year ago, and what you have is an industry apprehensive about the future. For growers, the question is no longer how much should I expand but how will I stay in business.

GPN spoke with a number of structures and coverings manufacturers to get a sense of how growers are dealing with the energy crisis and the downturn in the economy.

DOUBLE TROUBLE

It seems growers are battling two foes this year: gas and electricity. In certain areas of the United States, namely California and parts of the West Coast, inadequate supplies of electricity have forced rolling blackouts or "brown outs" for weeks on end. Spring crops have suffered as a result, and growers are now bracing themselves for a hike in electricity prices.

An even more pressing problem is natural gas. Gas prices across the United States and Canada have soared, with energy costs increasing up to 500 percent.

"The cost of fuel has definitely impacted the industry," said Linda Barnett, vice president of sales for Stuppy Greenhouses, North Kansas

City, Mo. "Growers are very aware of the cost of fuel, and many have been simply forced out of the business because of the extreme prices."

Growers who have chosen to weather the storm are constantly looking for ways to keep energy costs low.

"We've heard stories of greenhouse growers turning off their heating system to save money. But does this really save money, or do you end up losing more due to the effects on the crops and, therefore, loss of sales?" said Arthur Kroon, general manager of Ridder USA, Carpinteria, Calif.

For many growers, the focus has been on retrofitting their greenhouses for better heat retention.

"Many systems growers thought of as too expensive to implement a few years ago are now being viewed as money well spent," said Bill Christopher, who heads up international distribution for Gintec. Canadian-based Gintec has sold a significant number of thermal greenhouse screens this year, both in the United States and Canada.

"Thermal screens help insulate houses in the colder months but can also keep houses cooler during summer," said Christopher. "The screens are a tremendous energy savings and are now seen by many growers as essential."

Other greenhouse manufacturers have witnessed this same increase in sales of thermal screens and curtains. "We have helped a number of growers install shade/thermal curtains in poly houses in order to cut energy consumption costs as much as they can," said Frank Jonkman, Sr., president of Bradford, Ontario-based Frank Jonkman and Sons Ltd.

The use of automated shade systems has also increased. This system allows growers to easily open or close shade curtains depending on weather conditions and sunshine.

Growers who can are also recovering or retrofitting their operations with double polycarbonate walls.

According to Erin Huggett, national sales manager for Green-Tek Inc., many growers are spending the extra money on double poly walls now because in the long run it will pay for itself and then some. "A well-insulated, well-sealed greenhouse is essential today," said Huggett. "Most growers know they must use at least a double wall to have an efficient greenhouse."

AN OVERALL OVERHAUL

While many structures and coverings manufacturers are witnessing increased use of equipment that will help reduce a grower's bottom line energy bill, other industry experts have seen growers get innovative in other ways.

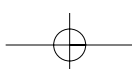
"We've seen growers put in curtains, benching systems, cooling pads, conveyor belts; anything that will help reduce costs," said John Pound, president of Pittsburg, Calif.-based AgraTech. "If a grower can save on labor or maintenance or operating costs, there will be that much more he can deflect into his energy bills."

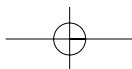
WHAT LIES AHEAD

While many growers and manufacturers alike have expressed their concerns about sales and profits this year, others are keeping a positive outlook.

"The general opinion may be that the market will be slower this year, but manufacturers are still quoting a lot of new jobs. Time will tell if greenhouse growers will postpone their decisions to buy or build due to high energy prices," said Kroon.

For those growers who are considering upgrading or even rebuilding, GPN has put together descriptions of some of the new and innovative products on the market. This is by no means an exhaustive list, but it should get you headed in the right direction. ▶





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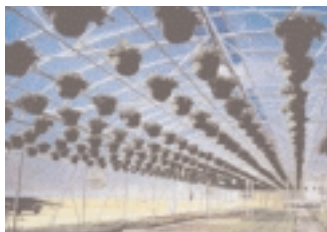
Tube motors from Advancing Alternatives

Torque sensing 33 NM and 60 NM motors can lock down the curtains under the Posi-Clasp Roll-Lock and shut off when the motor senses its full torque. The motors are then programmed to open from the fully locked position, allowing for expansion and contraction of the curtain material. Also offered are non-torque sensing sizes in 33, 60, 80 and 100 NM to suit a broad range of curtains. The non-torque sensing motors can be retrofitted to customers' existing curtains. All tube motor assemblies have four wheel roller guides, counterweight systems and steel-enclosed motor covers. Advancing Alternatives, Schuylkill Haven, Penn.



Inflatable roof by Agra Tech

The roll-a-roof is a 100 percent frame-supported, retractable roof. This simple system avoids cables, straps, eyelets and special fabric in favor of a frame-supported system and standard polyethylene film. The roll-a-roof double-polyethylene skin is inflatable and offers 40 percent more insulation than glass. Roll-a-roof seals tightly at the ridge with ends that are weather-sealed to reduce air seepage. The rolling beam, drivetube and roof leading edge spread weight evenly over the frame. A limited number of moving parts results in fewer breakdowns. This roof works with most quonsets, curve-bow gutter houses, cold frames and shade structures. Agra Tech, Pittsburg, Calif.



Educator's greenhouse from Atlas

The "Educator" is designed especially for the high school and college level horticulture classes. The "Educator" is 28 feet wide and comes in various lengths. It includes temperature control, benching, irrigation, a 4-foot-wide sliding door, hanging basket rails and 8 mm polycarbonate structured sheet covering that resists hail and student abuse. Atlas Greenhouse Systems, Alapaha, Ga.



Education series from Carolina Greenhouses

The new Education Series from Carolina Greenhouses boasts a 22-foot x 48-foot A-frame with state of the art equipment. Three-inch column posts, W trusses and 8 mm twin walls on the top, sides and ends are also standard features. Greenhouses in the series also feature a unitized roll seal cooling system, fans and a heating system. Carolina Greenhouses Inc., Kinston, N.C.



Sheet from Co-Ex

Macrolux Multiwall polycarbonate sheet is virtually unbreakable, with an impact strength 200 times greater than glass and 10 times greater than acrylic. It features energy savings of up to 60 percent over traditional glazings, with light transmission up to 83 percent. The sheets are available in 4-foot and 6-foot widths and in lengths up to 39 feet. Co-Ex panels offer a condensation control feature that reduces surface tension and allows water to spread into a thin sheet rather than form droplets. Macrolux polycarbonate sheets also come with a "non-prorated" 10-year warranty against yellowing. Co-Ex Corporation, Wallingford, Conn.



Retractable roof from Cravo

Cravo provides two types of retractable roof houses. "Flat roof" greenhouses provide cold protection in winter and shade in the summer. A variety of water-porous coverings can provide shading, cooling, cold protection and/or blackout. A-frame greenhouses have watertight roofs, providing the same control as a conventional greenhouse through rain, wind, snow and heating. Additional control — not possible with a conventional poly greenhouse — over light levels, ventilation and humidity can be achieved by retracting the roof. The most important benefit of a "Retract-a-roof" greenhouse is that it allows plants to be grown in their natural environment. Cravo Equipment, Brantford, Ontario.



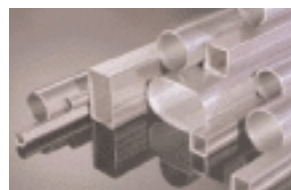
Acrylic sheet from Cyro

Cyro announces Acrylite SDP impact modified, double-skinned acrylic sheet. Acrylite impact modified provides all the acrylic benefits such as high light transmission and weatherability, while additionally offering hail resistance. It actually has 10 times the impact strength of acrylic. Never yellowing, Acrylite impact modified, double-skinned sheet eliminates the need for changing growing techniques due to aging. It provides stable growing conditions due to consistent light transmission. Long lasting, it comes with a 10-year limited warranty and is available in 8 mm or 16 mm. Cyro Canada Inc., Mississauga, Ontario.



Steel tubing from Delhi-Solac

Delhi-Solac Inc. manufactures pre-galvanized and galvalume coated steel tubing to meet the needs of an ever-expanding customer base. Delhi-Solac brands, Delhi Double Life and Delhi Pre-Galv are now available with acrylic lacquer coating for a cleaner, more user-friendly product. The lacquer coating provides a lustrous smooth finish, which resists peeling and chipping. All tubing is



produced to A.S.T.M. specifications in standard round, square and rectangular shapes up to 27 feet long. Delhi-Solac Inc., Delhi, Ontario.

Shade system from Gintec

Gintec's retractable thermal screen systems allow growers to obtain climate control all year. Winter heating bills can be reduced by as much as 50 percent when screens are closed at night. During the summer months screens can be deployed over the crop, returning temperatures back to an optimum growing range. These systems can either be cable driven or push-pulled by steel tubing. Either system is operated by electric drive units with reversing control and built-in limit switches. They can be operated manually or by computer. Gintec Shade Technologies, Windham Centre, Ontario.



Polycarbonate from Green-Tek

The 8 mm, Wide Flute, hi-clarity twinwall-structured sheet allows good visibility for sidewalls and endwalls and still provides a 200-pound impact resistance for roof panels. It has an advanced UV co-extruded top surface with a 10-year warranty against yellowing. In addition, it has the same advanced in-line application of condensation control. The Wide Flute double wall polycarbonate is good for those looking for the clarity of glass, with the strength, durability and condensation control of polycarbonate. Green-Tek Inc., Edgerton, Wis.



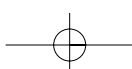
Sawtooth greenhouse from Hired Hand Green

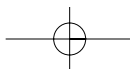
With Hired Hand Green's flat sawtooth design, growers can utilize maximum ventilation with 7-foot sawtooth vent openings, retractable shade systems and roll-up sidewalls. Hired Hand Green offers a variety of building widths and glazing options. Because of their extensive product line, Hired Hand Green has the ability and expertise to design the best system for your greenhouses, heating and ventilation needs. Hired Hand Green, Cullman, Ala.



Greenhouse from Janco

The Atlantic Series of Janco greenhouse structures is designed and engineered to meet the needs of commercial growers. It is available in standard and open-roof types, and with natural or mechanical ventilation. Components, including heating and cooling systems, are customized to meet growers' individual needs. A complete range of coverings, from poly to rigid, to acrylics to glass, is available, depending on grower requirements such as light transmission and other natural factors including snow load and wind variables. Janco Greenhouses, Laurel, Md. ▀





structures

Greenhouse film from Klerks

Since chemical growth regulators cannot be legally used in the United States for vegetable propagation or transplant growing, Klerks offers Kool Lite greenhouse film as an alternative. By reducing the far-red (700 nm and up) section of the light spectrum while maintaining a higher near-red (620-700 nm) and the lower blue (440-490 nm), plants receive the signal to maintain compact growth. This is effective for most plants, not just vegetables. The ability to utilize light to control growth has been known for years, but Klerks has developed a covering to do the job. Klerks Plastics Product Manufacturing, Richburg, S.C.



Power drives from Lock Drives USA

Lock EWA Series Power Drives operate everything from open roof structures, vents, shade systems and screening to roll up or down walls. Unique limit switches and accessories like Venlo gear racks and telescopic couplings make it easy to handle everything from large ranges to institutional greenhouses and garden centers. Lock Drives USA, Asheville, N.C.



Sawtooth greenhouse from Ludy's

Ludy Greenhouses recently designed and constructed their EZ-Up sawtooth greenhouse for St. Rose Nursery. The greenhouse is naturally ventilated. Ludy's EZ-Up Series of greenhouses feature a unique single bolt connection, which reduces man-hours for construction, operation and maintenance, yet costs up to 20 percent less than Ludy's popular Series II. Ludy Greenhouses, Richmond, Ind.



Greenhouse from Nexus

The Nexus Zephyr utilizes a fixed roof with the efficiency of natural ventilation. In the Zephyr, hot air escapes at the highest point in the greenhouse, not at the lower gutter area as in a wing design. Top ridge vents allow for dehumidification and ventilation even when snow is in the gutters. The Zephyr can be very cost-effective with the use of the



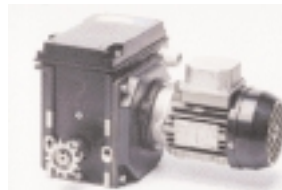
optional Nexus "Nervent" (reinforced cloth drop curtain vent), which allows for a variety of opening options. Nexus Greenhouse Systems, Deerfield Beach, Fla.

Greenhouse from Poly-Tex

The new Super-Mart greenhouse from Poly-Tex Inc. now comes standard with pre-assembled, heavy-duty welded trusses for added strength and quick installation. Full height bi-fold doors for the sidewall of the Super-Mart allow for complete ventilation and easy customer access. Twelve-foot to 14-foot gutter heights, glass storefronts, custom trim and complete display fixtures are all available options. Poly-Tex, Castle Rock, Minn.

Motor from Ridder

Ridder's RW245 geared motor is a compact model with self-breaking worm wheel transmission. It includes a built-in limit switch system with working and safety switches. It has a double-sided output shaft with 12-teeth chain wheels for chain couplings. It is provided with powder coating and includes fastening bolts and safety rings. Its color is graphite grey. Ridder USA, Carpinteria, Calif.



Greenhouse from Rimol

The Northpoint series of freestanding greenhouses are grower-designed structures able to withstand severe weather conditions due to the trusses that are on every set of bows. This feature doubles the strength of every bow and allows the added feature of installing additional purlin pipe for hanging baskets. These greenhouses are available in widths of 22 feet, 26 feet and 30 feet. Rimol Greenhouse Systems Inc., Hooksett, N.H.



Greenhouses from Structures Unlimited

Structures Unlimited gutter-connected or free-standing greenhouses are cost-effective choices. They feature a simple, strong design that withstands high winds and adverse weather. Utilizing one center purlin, the semi-gothic arch shape offers maximum headroom even close to the sides of

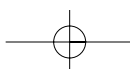


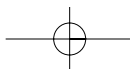
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the house. Slightly peaked roof reduces the potential problem of condensate dripping. Structures Unlimited, Sarasota, Fla.

Open-air greenhouse from Stuppy

Stuppy has developed an answer to the open-air greenhouse, the RBG II. The RBG II reduces growers' up-front capital expenditures, as it can initially be covered with air-inflated double poly and later be converted to Dynaglas UVII dual-coated 8 mm twinwall polycarbonate. The RBG II offers ease of operation and lower equipment costs by eliminating fan usage. The RBG II has a stationary 6-foot bay at each end to cover and protect equipment located at endwalls. Models are offered in code or non-code versions and are available in 24-foot and 36-foot widths. Stuppy Greenhouse Manufacturing, North Kansas City, Mo.



Screen from Svensson

Svensson designed the PLS series to protect crops against wind, frost and strong rain. The durable screen works by reflecting the radiant heat back onto the crop. When the plants stay warm, they resist dew formation. Screen can be installed permanently or movable. Made of porous material to allow water to travel through when installed flat, or to repel the majority when on a slope. PLS also has the benefit



of offering shade from 20 to 99 percent by means of reflection. PLS is designed to last from 8 to 15 years depending on its use. Svensson, Charlotte, N.C.

Operable roof greenhouse from Van Wingerden

The MX-II operable roof greenhouse from Van Wingerden provides a variety of weather conditions. The roof closes entirely for normal greenhouse operation. Opened slightly, it permits ventilation while protecting from rain and snow. The roof can be incrementally opened to remove condensation and to completely control ventilation. With staged opening, ventilation can be increased without the use of fans. When fully open, light and natural outdoor conditions are maximized, hardening crops without moving them outside. This multi-purpose greenhouse is manufactured to accept shade, hanging basket, irrigation, lighting, crop support and heating systems. Van Wingerden Greenhouse Company, Horse Shoe, N.C.



A-frame from X.S. Smith

Traditional A-frames get a new look with the Sunshine 42-foot welded truss rafter configuration. Sunshine combines aluminum gutter technology and a unique roofline into a wide range of A-frame structures. The Sunshine has the ability to integrate equipment systems, such as roof and side vents for natural ventilation, and screening systems for light



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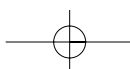
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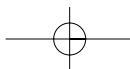


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and temperature control. Engineered for multiple levels of control, the Sunshine greenhouse is X.S. Smith's most adaptable greenhouse. Simple truss construction reduces structural clutter and optimizes growing space and light transmission. It can be covered with polyethylene, polycarbonate or acrylic panels. X.S. Smith Inc., Red Bank, N.J.

Shade system from Wadsworth

Wadsworth's PowerPull is a push-pull shade system perfect for outdoor shading and display of Christmas trees (prevents drying). Garden center owners like its ability to protect crops from the heat while keeping the customers' environment comfortable. The quiet and dependable PowerPull has minimum



friction. Its simple design is quick and easy to install. With rack and pinion

drive, there are no cables to re-tension. The system's drive unit is centrally positioned for maximum efficiency and minimal strain on the structure. Wadsworth Control Systems, Arvada, Colo.

Greenhouse from Westbrook

The Skyline was originally designed in 1995, and has since evolved into the Skyline II. It is a "year round" greenhouse that has the option of a tempered glass or polycarbonate roof. It offers complete ventilation and sunlight. Skyline's design is aesthetically unique, making it appealing for a retail outlet. Westbrook Greenhouse Systems, Grimsby, Ontario.



What Can You Do?

Here are a few questions every grower should ask to make sure their greenhouse is running as efficiently as possible. (Questions courtesy of Arthur Kroon, Ridder USA.)

The key to energy savings is making sure your greenhouses are well maintained.

- Are your ridge vents all the way closed, or do you have to reset the limit switches a little? A cracked vent works as a chimney and the heat escapes fast.

- Is your roofing material in good shape or should you repair/replace the material? What about the walls of your greenhouse, are they in need of repair?

- What is the condition of the heating system itself? Do you have a boiler system that is 95 percent efficient? Do you have heaters that are 99 percent efficient? These products are available and, again, the pay back time is low. Lower than ever.

For more things you can do to offset high energy bills, turn to pg. 36.

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