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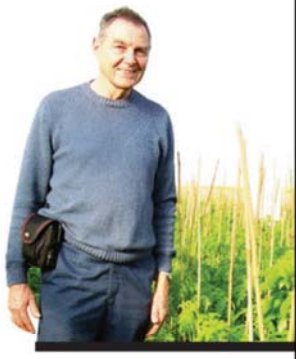

Save your crops with a backup generator

2011 was a banner year for electric power interruptions. The hurricanes, tornadoes, earthquakes and snowstorms affected many parts of the country. Deferred power line maintenance by the electric companies and fewer linemen added to the time it took to restore the system. Restoration time as long as 10 days occurred in some areas.

How did this affect your business? What changes are needed to cope with future interruptions? It's surprising the number of growers that don't have a backup power unit.

A reliable generator is necessary for a greenhouse business to keep essential equipment operating when the utility power is interrupted. Interruptions of more than a few minutes during a cold winter night or hot summer day will allow the temperature to exceed the acceptable limits. Heating equipment, fans, vent motors and control systems need to be kept running. Lighting, water pumps and other essential equipment are also needed.

Engine-driven units can be powered by gasoline, LP gas or diesel fuel.

Best selection

There are many models of generators available. They can be classified as engine driven or tractor driven. Engine-driven units are self-contained with the engine integral with the generator. These can be portable in sizes up to about 15 kilowatts (kw) or pad mounted above that size. Smaller portable units are usually hand carried and larger ones mounted on wheels.

Engine-driven units can be powered by gasoline, LP gas or diesel fuel. LP gas units tend to burn cleaner and require less maintenance. Diesel units cost more but have a longer life. When selecting a unit consider the type of fuel that is normally available on the farm. Water-cooled engines are usually supplied with generators higher than15 kw.

Tractor-powered generators have a lower initial cost because they don't require an integral power source. A tractor large enough to power the unit should be available at all times. Generally it requires 2½ horsepower of engine capacity for each 1,000 watts of generator capacity. The unit is connected to the tractor through the power take-off or by V-belts. Accurate control of tractor speed with a tachometer is essential to maintain the 1,800 or 3,600 rpm needed.

Proper voltage is essential for safe operation of electrical equipment. It must be matched to the greenhouse equipment. Most large generators are available with multiple voltages. Common voltages are 120/240. Some units will provide both single and three-phase power. Most generators manufactured today utilize solid state diodes to eliminate brushes on the commutator.

Generators are usually rated for continuous duty and load. Heavy-duty units will take considerable intermittent overload that helps in starting larger motors.

Location

A location for the generator near the electric distribution panel is best. Portable units can be stored indoors and then moved outside when the backup power is needed. Some protection from the elements is desirable. Quick connect wiring of adequate size should be provided.

Permanently mounted units are generally located in a building for weather protection. Adequate ventilation is needed for engine heat removal. The exhaust must be vented outside and the pipe kept at least 6 inches from combustible material. A muf-

ABOVE: Generators are usually rated for continuous duty and load. Heavy-duty units will take considerable intermittent overload that helps in starting larger motors. LEFT: Except for a small standby generator that you can use to plug in a few lights or small motor, all units should be connected to the electrical distribution box by a transfer switch.

fler will keep exhaust noise at an acceptable level.

Power needs

A standby generator can be sized to power all the equipment on the farm or just essential equipment. Full load systems are expensive.

Two lists of the essential electrical equipment should be made; one for equipment operated during the summer and one for the winter. Summer equipment would include all the fans and vent motors. Winter equipment would include furnaces and boilers. The lists should contain the size, type, horsepower and phase of all motors. It usually takes four to six times as much power to start a motor as it does to run it. Check those motors which must be operated during a power interruption. Also list the nameplate wattage of all equipment and the wattage of all lights. A 5,000-watt generator will usually operate all the essential equipment for three or four hoophouses. A 25-kw unit is commonly installed for a one-acre, gutter-connected house.

Discuss your needs with the electric supplier's representative as well as a couple of standby generator suppliers. Most companies have a computer program that will help to determine the size of unit that is needed. Before purchasing a unit, have your electrician work up a wiring plan to connect the unit to your present electric service and distribution system.

Meet safety codes

Except for a small standby generator that you can use to plug in a few lights or small motor, all units should be connected to the electrical distribution box by a transfer switch. This transfers or changes the source of electricity being used from the power company wires to the standby unit. It protects power company employees from feedback that could endanger their safety. The transfer switch is usually located next to the distribution box for ease of wiring.

A system transfer switch has the same ampere rating as the distribution box switch and allows the operation of any circuit up to the output capacity of the generator. There are also lower rated transfer switches that limit the operation to a few important circuits. These are less expensive but require more wiring. Installation must be in accordance with the National Electrical Code.

Although a standby electrical system can be made completely automatic, these are not very common in most greenhouse operations. They are considerably more expensive and require an engine-starting control and automatic-load-transfer control. Unless the equipment controlled has to be operated continuously, a manual system and telephone dialer alarm usually works well. An automatic system has to be sized to start all the motors that may be in operation at one time or have time delay relays installed.

Operating, maintenance procedures

An operating procedure should be developed for use during an emergency. Before starting the generator, shut off all electrical equipment. Place the transfer switch in the position to operate the generator. After the unit is started check the voltage. Then place the essential equipment into operation starting with the largest motor first.

If you already have a system in place, have you started it recently? A strict maintenance schedule should be followed so that the generator will always be ready to operate. Exercise the equipment at least once a month under load and keep a record of the testing dates. Store extra gasoline or diesel fuel in a safe place. Train someone else to operate the unit in the event of a power interruption in your absence. Be sure that power interruption and high-low temperature alarms are in good operating condition.

A standby generator is a good insurance policy for times when the utility power is interrupted. It can save your crops and keep the greenhouses heated or cooled. GM

HAVE A QUESTION? You can write John at jbartok@rcn.com.