Using Waste Oil to Heat a Greenhouse

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History

During the winter of 1990, Northwoods Nursery (Elk River, ID) purchased a wood-burning system to heat the current greenhouses. This system burned slabs of wood to heat water that was then pumped into the greenhouses.

The winter of 1990 was extremely harsh, requiring non-stop operation of the heating system. In order to keep seedlings in the greenhouse from freezing, the burner required stoking every 30 minutes for 24 hours per day, 7 days per week. If the system was allowed to go out, there was no method available to restart the burner, and all water pipes would freeze very quickly.

The point learned during that period was to research options before buying a heating system for greenhouses.

Current System

Due to the problems encountered with the wood-burning system, Northwoods Nursery converted from wood to a waste oil system. At that time, waste oil was a great alternative due to the cost, that is, free. Loggers were dumping waste oil on roads and in creeks, and would therefore make it available to the nursery as a disposal alternative. But change happens.

During the past year, waste oil has become a commodity. The nursery has started to use stove oil, used cooking oil, waste oil, or whatever anyone provides that will burn in the stove. In the current burner, the oil enters through an injector (similar to a jet engine), and shoots heat into a baffling system. Water is heated in a large aluminum tank and then pumped out to heat the greenhouses (figs. 1 and 2). The water needs to be treated to prevent corrosion.

All pipes carrying heated water are insulated with Styrofoam™, although a low cost alternative could be old Styroblock™ containers. All fittings are placed above ground for easy access and maintenance.

Cautions

Waste oil must be kept warm prior to use. The nursery currently keeps the oil in a tank in the burner room so that the oil will remain liquid.

Precautions must be taken with ash resulting from burning a combination of waste oil and oil from unknown sources. Because oil from diesel engines may contain heavy metals, ash from this type of waste oil cannot be used with food products or fertilizer applications.

Figure 1. Waste oil burner in use to heat greenhouses at the Northwoods Nursery.

Figure 2. Pumping system for hot water distribution to heat greenhouses.

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