WINDBREAKS REDUCE GREENHOUSE HEATING COSTS

John W. Bartok, Jr.
Extension Agricultural Engineer

The heat loss from a glass greenhouse in a 15 mph wind is double what it would be in still air. The effect is not as great in fiberglass and plastic houses because there are fewer cracks and joints through which heat can be lost. The wind can also affect crop production by creating a cold section on the windward side of the greenhouse and can reduce the effectiveness of CO_2 supplementation.

When building new greenhouses, selection of a site with shelter on the winter windward side is a good choice. This is especially important in areas of the country where moderate to high winter winds are common.

For existing greenhouses, not protected by existing trees or buildings, some shelter can be provided by erecting an artificial windbreak or planting a shelter belt of trees. Any barrier which obstructs the flow of wind creates a zone of shelter nearby, mainly on the leeward side. When the wind encounters a barrier, its uniform current is distrubed and the turbulent motion exerts a break on the forward velocity. A cushion of air backs up in front of the windbreak and the major part of the horizontal air stream is deflected over the top. The density of the barrier determines the distance downwind where the wind resumes its original speed.

To provide temporary shelter, use a fence. Commercial snow fence, one-inch think boards or woven polypropylene netting designed for this purpose will provide protection. A porosity of 50 to 60 percent is best.

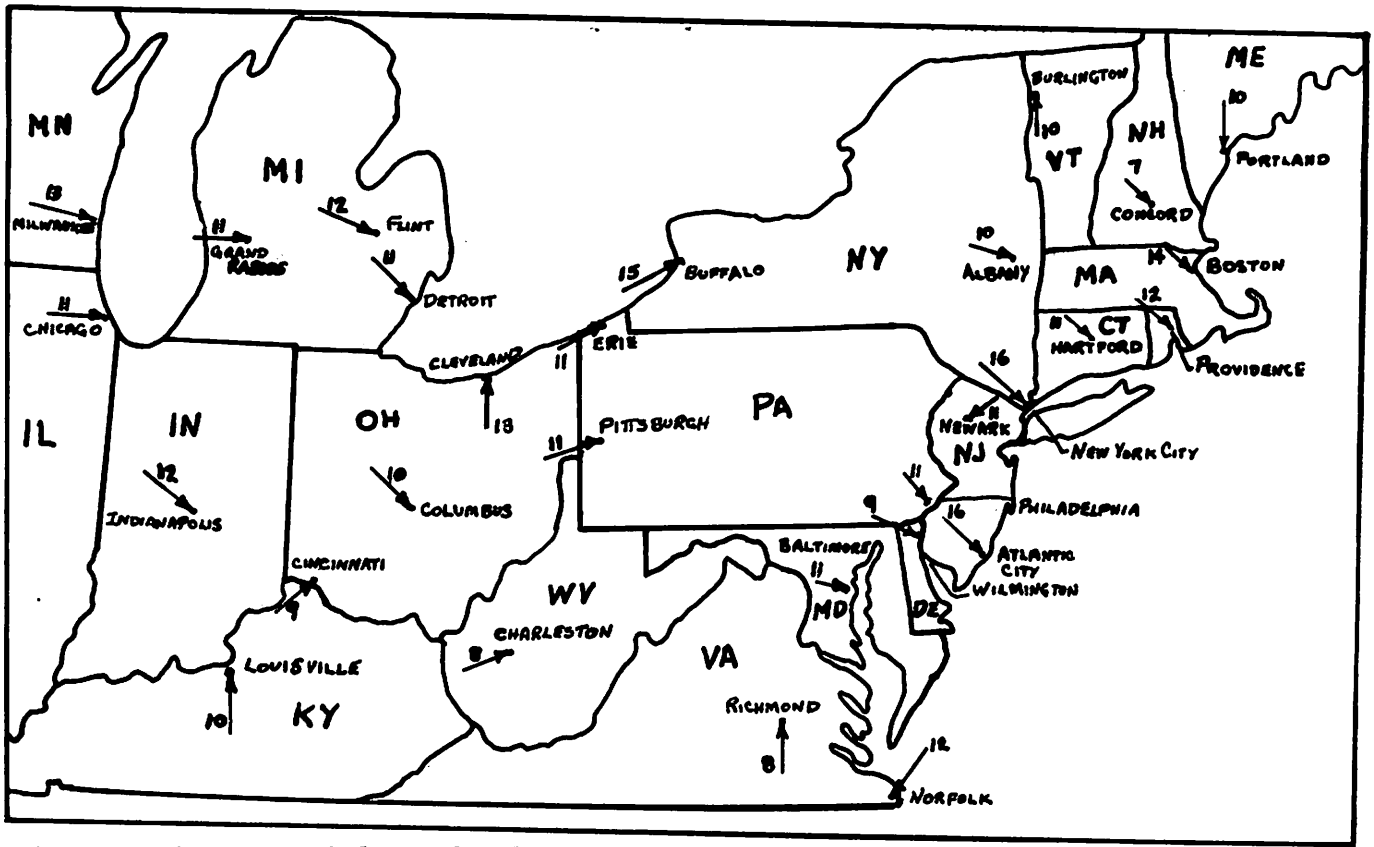

Figure 1--Average Wind Speed and Direction in January.

For the typical greenhouse with a ridge height of 11 to 14 feet, a fence height of 10 to 12 feet will give good wind reduction. For best protection the fence should be located 40 to 60 feet away from the greenhouse on the windward side. This location will reduce wind speed up to 300 feet downwind. Six inch top diameter posts spaced 10 feet apart and set four feet into the ground are needed to support the fence.

For more permanent protection, a shelter belt of trees should be planted. The species of trees to use will depend on the soil type and climate but generally a mixture of deciduous and conifers give better winter protection. The rate of growth of the trees and their tolerance to high winds should also be considered. White Pine, arborvitae, red maple and pin oak can be used in the east. The shelter belt should be made up of four or five rows of trees spaced to give maximum protection as they grow. A shelter belt 30 feet high affects wind speed for 100 yards in front of the trees and 300 years downwind. The greenhouses should be located within this 300 yard distance. The length of the windbreak or shelter belt should be 30 to 50 feet longer than the width of the greenhouse area to be protected. This allows the wind to pass over and by the greenhouses before its velocity returns to the initial speed.

With increasing fuel prices, consideration should be given to using this method to reduce heating costs.

References:

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