

ISU Formulation Allows Zero-Degree Spraying

The number of hours a day and days per season acceptable for dormant-season spraying with pesticides may be extended greatly, thanks to research done at Iowa State University, Ames.

How? By using methyl alcohol with water instead of water alone for preparing spray formulations, it is possible to have sprays that can be used at temperatures down to zero degrees Fahrenheit.

Dr. A. H. Epstein, extension plant pathologist at ISU, who is concerned with Dutch elm disease control, examined the exacting conditions required for spraying for the elm bark beetle which spreads the disease. Normally to spray, bark has to be dry, the wind can't exceed 5 mph and the temperature must be above freezing, simply because if it's colder, spraying equipment may be damaged or ruined by ice.

Some seasons this combination of conditions just doesn't occur in some localities. Being able to spray at temperatures below freezing would almost eliminate one of the limitations, Epstein noted.

Working with methoxychlor, Epstein observed that spray mixtures generally used in helicopter sprayers and mist blowers consist of either 12.5% or 16% insecticide in an emulsifier (xylene) mixed with water.

"A 12.5% spray emulsion could be prepared by mixing water and 25% spray concentrate on a 1-to-1 basis. This emulsion would freeze at or very slightly below freezing," he says.

However, by using methyl alcohol, the freezing point of the mixture can be lowered. Using 10, 20, 30, 40 and 50% alcohol concentrations, Epstein found he could lower the

freezing point to 28, 24, 16, 10 and 0 degrees Fahrenheit, respectively.

Examination of results of spraying glass slides and elm bark with the low-temperature sprays showed resulting residues were quite similar in evenness and concentration to those left by more conventional applications made in "normal" warmer temperatures.

"The spray droplets dried into spots that looked like dried varnish," the plant scientist says. Additionally, study of residues of the same sprays applied in March to trees outdoors showed that substantial amounts of methoxychlor remained on them 123 days later. Use of the low-temperature formulation did not appear to affect the residual qualities of the pesticide.

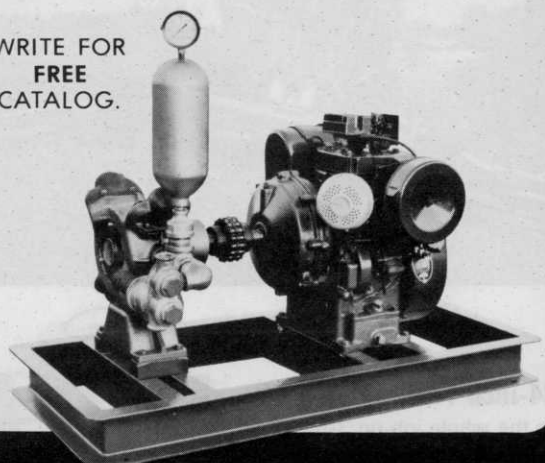
Presently, treating for control of elm bark beetles, and, in turn Dutch elm disease, is the main application of dormant-season sprays. However, Epstein says, additional work is being done and winter spraying of other plants could become practical for some pest control problems.

So, the possibility of adding an "anti-freeze" to pesticides may become important in the near future.

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