

## Davey's research examines safety question

Herbicides used properly will not damage ornamentals, turf, or non-target species. That is, according to the results of a multi-year joint research project conducted by Davey Tree and Sandoz Crop Protection Corp.

The study was designed because lawn care herbicides such as Trimec, dicamba, MCPP and 2,4-D are often blamed by homeowners for damage to ornamentals. Also, a lack of research information and pictorial guides exist showing the typical symptoms of lawn herbicide damage, says Dr. Bal Rao, Davey's manager of technical resources.

"One of the most common complaints from our lawn care clients is herbicide injury to ornamentals," says Rao.

In all, 210 plants were tested beginning in 1980 at the company's research farm in Shalersville, Ohio. Ornamental shrubs and trees—including arborvitae, Colorado blue spruce, rose, privet, juniper, taxus, rhododendron, sugar maple, pin oak and linden—were randomly planted in blocks.

### Questions to be answered

Key answers Rao sought included the potential for drift contamination from

these compounds, the rate at which they build-up, and lateral and downward movement in the soil.

The herbicide treatments and rates per 1,000 sq. ft. consisted of: 1) no herbicide, 2) Trimec at the recommended rate, 3) Trimec at twice the recommended rate, and 4) twice the recommended rate of the three individual compounds that comprise Trimec: 2,4-D, dicamba and MCPP. "There's always the potential for damage to ornamental broadleaves by these materials (Trimec, dicamba, MCPP and 2,4-D) if the spray material comes in contact with actively growing broad-leaf plants as a result of sloppy application—or if the material is applied on a windy day," says Rao.

The first applications were made in late April 1982 at Davey's standard rates and methods. No evidence of herbicide injury was found in any of the treatments until 1984, when injury symptoms were noted on only three species: linden, maple and taxus. The injury symptoms were observed in only those blocks treated at twice the recommended rate with dicamba. No other injuries were noted.

Rao says that the foliar damage

noted was not permanent, and the plants eventually recovered. "If these materials are used properly at recommended rates, they aren't harmful or detrimental, and one should expect no adverse effect on non-target species," says Rao.

### Containerized plants examined

The companies also completed a "dramatic drift study" where containerized plants—including rhododendron, juniper, ivy, grape and raspberry—were treated directly with dicamba, 2,4-D and Trimec.

Plants were distributed at random in test plots and treated directly with recommended rates of dicamba, 2,4-D and Trimec in August 1984. Subsequent visual observations for herbicide spray injury were made at one-week intervals until October.

Rao discovered that various species respond differently to the herbicides. Rao and a panel of experts later rated the containerized plants on a sensitivity scale from low to high.

The Davey Tree species sensitivity study discovered that juniper experienced only a slight yellowing of young leaves from contact with all three materials, while arborvitae and rhododendron suffered damage ranging from slight yellowing to cupping of new growth, depending on the material applied. However, neither species experienced terminal bud kill or complete defoliation from dicamba, 2,4-D or Trimec.

According to Rao, less than one percent of the complaints analyzed by the Davey lab are linked to herbicide damage, and these problems are most likely caused by inexperienced applicators. "The fact is that insects, diseases, mites, or even frost and heat can cause mimicking symptoms of herbicide damage which complicates diagnosis," says Rao. "It's very hard to diagnose herbicide damage. Planting and post-planting care, diseases, insects and environmental factors are all potential causes of damage. Many times I find that the problem may have started years ago with the homeowner. Over-application of materials is quite common, and many times the damage to ornamentals doesn't appear until the following season."



Bal Rao, Ph.D, is manager of Technical Resources for the Davey Tree Co., Kent, Ohio and a monthly contributor to *Landscape Management*.