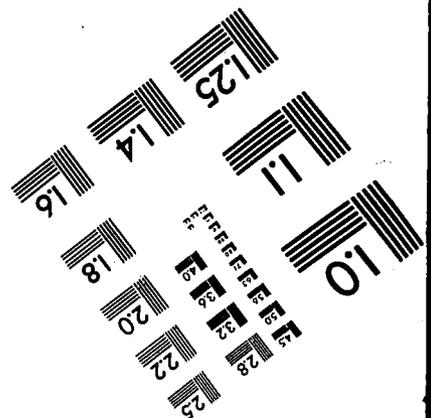
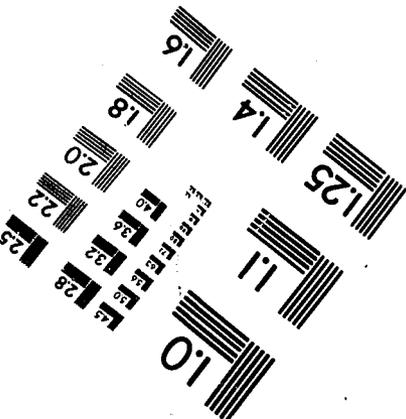
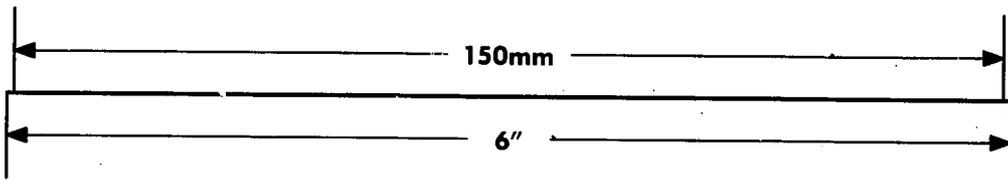
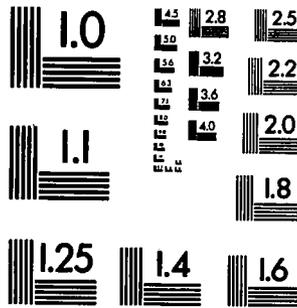
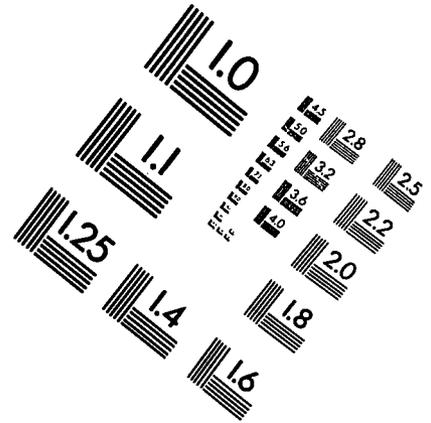
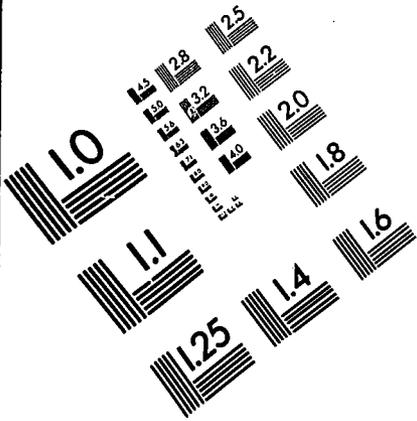


# IMAGE EVALUATION TEST TARGET (MT-3)



**APPLIED IMAGE, Inc**  
 1653 East Main Street  
 Rochester, NY 14609 USA  
 Phone: 716/482-0300  
 Fax: 716/288-5989

© 1993, Applied Image, Inc., All Rights Reserved

J305

# Herbicide Safety Gets Shorted in the Field

Herbicide safety has received its share of attention during the past few years. But is the message getting through to farmers and applicators?

The National Institute for Occupational Safety and Health (NIOSH) recently studied 27 well-trained commercial applicators using alachlor. The herbicide, a known animal carcinogen, is also suspected of causing cancer in humans.

What they found was not good. Although all 27 applicators specialize in applying herbicides and fertilizers to cropland and have plenty of training, some use poor work practices and inadequate protective clothing, NIOSH found.

In addition, the NIOSH observers measured air exposures by collecting samples in the applicators' breathing zones and skin exposures by attaching patches to their clothing.

Finally, to estimate the amount of

alachlor their bodies absorbed, the agency representatives collected urine samples from the applicators.

Applicators with the highest air and skin exposures also had the greatest amount of herbicide in their urine.

In other words, steps taken to reduce air and skin exposures also would have reduced the amount of herbicide absorbed into the body.

NIOSH observers found that the thighs and the hands of the applicators had the greatest exposures. Thighs were exposed during mixing and loading operations, when workers were splashed with the application mixture and when they leaned against contaminated equipment. Workers also wiped contaminated hands on their pants legs.

Hands were exposed during mixing and loading operations and when the applicators worked on equipment.

Because of improper use, gloves were not as effective as they could have been.

Although 24 out of the 27 workers in the study wore gloves when handling herbicides and doing maintenance, 40% of the gloves were highly contaminated on the inside.

Because some maintenance is difficult to perform while wearing gloves, the applicators often removed them.

Then, when finished, they would put their gloves back on without washing their hands. These practices constantly contaminated glove insides.

Most applicators used the same pair of gloves for several successive days without cleaning or replacing them. They continued to wear gloves that had obvious cracks and holes. Of the 24 workers who wore gloves, 9 wore cotton-lined pairs, designed for working with anhydrous ammonia. The cotton lining absorbs herbicide.

The gloves did provide some protection, however. Contamination on the outside of the gloves was always higher than on the inside.

Although clothing obviously protects the skin, patches under shirts showed that herbicide did penetrate. Studies have shown that nonwoven fabrics and woven fabrics of heavy-cut twill provide the best protection.

Some workers were conscientious about applying herbicides, but others were more careless.

Some of the workers were observed eating and smoking with contaminated hands. And on two occasions, applicators were drenched with herbicides, but they continued working for several hours.

**By WAYNE T. SANDERSON**  
*Editor's note—Sanderson is a research industrial hygienist with NIOSH in Cincinnati, Ohio.*



Gloves, goggles, and other gear are important in the safe handling of herbicides. But a NIOSH study revealed what can happen when they are improperly used.

PHOTO: JOE LINK

## Basic Safety Tips for Handling Herbicides

- Wear chemical-resistant aprons and gloves during loading, mixing, and maintenance operations. Skin and clothing are likely to be contaminated from spilling or splashing of herbicide mixtures. Also, be sure to wear an apron while leaning against contaminated surfaces. It should be long enough to protect the thighs.
- Gloves should be resistant to herbicide permeation. Butyl or nitrile rubber gloves give better protection than do disposable vinyl or latex gloves. Cloth or cotton-lined gloves should not be worn.
- Avoid contaminating the insides of the gloves. If you must remove your gloves to perform maintenance operations, be sure to wash your hands before putting the gloves back on. Wash the outside of the gloves frequently with soap and water. Damaged gloves should be replaced.
- Wash your hands frequently, especially after mixing, loading, and maintenance operations. Soap and water should be carried to the field. Applicators should never smoke cigarettes or eat with contaminated hands.
- Wear long pants, long-sleeved shirts, and caps when applying herbicides. Clothing should be thoroughly laundered before reuse. If clothing is accidentally soaked with pesticide, the applicator should shower and change as soon as possible.
- Continually evaluate your work practices and review label requirements so that you can handle your herbicides safely.

**END**

**11-05-96**