Safety and Fungicide Use Restrictions

A pesticide label will provide most of the needed safety information for both the applicator and others while spraying field crops. A synopsis of some of the dangers and restrictions for some common fungicides is provided below.

Personal protective equipment

Fungicides labeled for use on field crops have minimal requirements for personal protective equipment, with a few exceptions:

- long-sleeved shirt and pants,
- shoes plus socks, and
- chemical-resistant gloves.

Some fungicides require coveralls over regular work clothing, and some fungicides only require waterproof gloves. Also, many of the available fungicides require protective eyewear.

Other personal protective equipment requirements may include chemical-resistant footwear, chemical-resistant headgear for overhead exposure, and a chemical-resistant apron when cleaning, mixing, or loading (e.g., Headline®). A few fungicides may require the use of a respirator. The details about the specific type of respirator will be listed on the label.

Worker Protection Standard (WPS)

The WPS is a federal regulation designed to protect agricultural workers and handlers. It covers pesticides that are used in the production of agricultural plants on farms, forests, nurseries, and in greenhouses. If the pesticide being used has an "Agricultural Use Requirement" statement in the "Directions for Use" section of the label, the applicator must comply with the

WPS. The most recent information about the Standard may be obtained by checking the September 2005 updated WPS *How to Comply* manual. A helpful website that has information about the WPS is **http://www.epa.gov/agriculture/twor.html**.

Restricted-Entry Interval (REI)

All agricultural pesticides labeled after April 1994 are required to have a REI stated on the label. REIs for fungicides, like other pesticides, are established to reduce pesticide exposure and are based on the product toxicity. REIs typically range from 12 to 24 hours for most fungicides available for field crops. In general, workers may not enter a treated area during an REI. Early entry that will result in contact with surfaces treated with pesticides is permitted in only three work situations:

- Short-term tasks that last less than 1 hour and do not involve hand labor.
- Emergency tasks that take place because of an agricultural emergency.
- Specific tasks approved by EPA through a formal exception process, which includes additional pesticide training for the worker.

Preharvest Interval (PHI)

A PHI is the minimum amount of time that must pass between the last pesticide application and the harvesting of the crop, or the grazing or cutting of the crop for livestock feed. Typically, PHIs for fungicides applied to field crops range between 21 and 30 days depending on the crop and applied fungicide. Chlorothalonil products have 42-day PHIs. Some fungicides have restrictions based on growth stages instead of a specific number of days (e.g., fungicides cannot be applied later than soybean growth stage R5). If a crop is harvested before the PHI has passed, there may be excessive pesticide residues on that crop. Fungicide labels should be carefully reviewed for specific use limitations.

D. S. Mueller

Soybean rust.

Other restrictions and precautions

Additional restrictions or precautions are specific to individual fungicide labels. Labels should be read carefully before application to get specific information for the product being used. Some examples of specific restrictions or precautions include

- Restrictions against using treated crop for livestock bedding or feeding.
- Restrictions on use of fungicide near waterways.
- Plant back restrictions for certain crops.
- Precautions about use on certain varieties of a crop.

Safety and Seed Treatments

Seed treatment products also need care in handling—if not highly poisonous, many are at least irritating to the eyes and nose. Treated seed usually is identified by the dye used with the chemical. Treated seed should not be fed to livestock or used for human food. Pesticide containers should be disposed of properly in a landfill or buried in an area where there is no surface drainage to nearby waterways. If seed treatment cannot be done outdoors, it should be done in a well-ventilated room. Commercial seed treaters should have an adequate air exhaust system for treatment rooms. Workers exposed to seed treatment chemicals for long periods should have an approved chemical mask and the filter should be changed frequently.

For more detailed information on pesticide safety and restrictions, fungicide labels and material safety data sheets (MSDSs) should be carefully read. Many fungicide labels and MSDSs can be found online at manufacturer websites as well as the Crop Data Management Systems (**http://www.cdms.net**) and Greenbook (**http://www.greenbook.net**) websites.

Also, information can be found at local extension offices or at the following websites:

- American Association of Pesticide Safety Educators (AAPSE): **http://aapse.ext.vt.edu/**
- What is a pesticide? (U.S. EPA): **http://www.epa.gov/pesticides/about/**
- EXTOXNET—Extension Toxicology Network: **http://extoxnet.orst.edu/**
- National Pesticide Information Center (NPIC): **http://npic.orst.edu/**

C. A. Bradley

Soybean seeds treated with a fungicide and blue dye.