

Safe pesticide use

Chemical use has become common in many tree nurseries, just as in agriculture. Unfortunately, the safe use of chemicals is not equally common. This will not change until the people who use the chemicals demand that proper protection be taken. The person most responsible for your safety is you. Your family depends on you to take good care of yourself! A *good nursery practice* is to make safe chemical use part of your everyday routine. Teach others to use them correctly as well. Some people may laugh at you, or complain that safety is too much bother. They are wrong, you are right!

If you are using chemicals at your work, or if you are told to do so by your boss, then you must insist that you be provided with the proper protection. More than likely, it is the law in your country that your boss provides these materials, but the only one to enforce these laws is you. It is not acceptable to provide chemicals without providing gloves, protective glasses, soap, etc. for your protection as described below. Ask for safety information about the specific chemical that you are applying. Remember that natural chemicals are often just as toxic to people, animals and fish as synthetic ones.

You do not have to risk your health unnecessarily.

Classification of pesticides

Chemicals are commonly called pesticides because they fight organisms which harm plants. They are not all the same — they are not simply ‘medicine’. If you understand the differences between these groups of chemicals, you can use the most appropriate one for a specific plant problem. By knowing more about pesticides you can also ensure that you only buy the chemicals that you need, when you need them. Keep an inventory of the chemicals already in the nursery and buy chemicals only in the quantities you need. Try to exchange your surplus chemicals with other nurseries. This avoids problems with safe chemical disposal.

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**Teach others
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Chemicals are classified by their use:

- fungicides kill fungi
- insecticides kill insects
- herbicides kill weeds
- bactericides kill bacteria
- nematocides kill nematodes (soil-dwelling worms).

Some pesticides act only upon direct **contact** with the pathogen, usually one living on the outside of the plant. Therefore it is important to spray all parts of the plant including the underside of the leaves. Others act **systemically** — they are absorbed by the plant, and only after a plant part is ingested by the pathogen (usually one living inside the leaf, stem or root) does the pesticide take effect. Some act to kill a **broad spectrum** of pathogens (and often the

beneficial organisms), while others work against **specific agents**.

Some are **curative** (stop the damage once started) others are **pre-ventative** (stop the damage before it starts). Plant pathogens are very effective at damaging plants because they have a short life span and because they easily become resistant to the active ingredients in pesticides. Rotating between different types of active ingredients may be the most effective way to reduce pest problems.

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A good nursery practice is to take several samples of the affected seedling to the agrochemical dealer and ask for expert diagnosis of the problem. Tell the dealer what chemicals, if any, you have already tried. In many countries, like Mexico, by national law the store must have a trained parasitologist (person who studies plant diseases) at the store, or who visits the store on a regular (weekly)

basis, can accurately name the cause of the plant problem, and knows the most effective pesticide and the correct dose to apply.

In Latin America chemicals are rated and labelled based on their toxicity, or how much of the chemical it would take to kill a person.

Green label — lightly toxic
Blue label — very toxic

Yellow label — moderately toxic
Red label — extremely toxic



Post, read, and explain the pesticide labels at the nursery. Teach others how to use them correctly. Ask for help if you do not understand how to use them.

The effects of pesticides on people

Pesticides can enter our bodies in many ways:

- through the skin
- through the nose, when breathing
- through the eyes
- through the mouth, when eating, drinking, breathing, smoking or chewing gum.

The effects can be felt immediately, after one hour or sometimes much later. They include pain, coughing, vision problems, weakness, stomach problems, headaches, vomiting, trembling, diarrhoea, sweating, fever, coma, death.

Sometimes, it takes many years for the symptoms to occur. This long-term exposure is just as serious as an immediate poisoning. It may even be worse, because a person may not notice anything at the time, but only years later, when it is too late. This may also affect your unborn children. They may be sick or have deformities because of the pesticides stored in your body. It may or may not be difficult to prove this. However, isn't it better to know that you did everything you could to protect them?

Maybe you have experienced the bad effects of pesticides on your body. Most people know of someone who has become sick. These experiences are unnecessary and hazardous to your health and your family's. Once is already too much!

A pesticide mishap

A man had to spray fungicide in his nursery. He thought he was well protected because he was wearing gloves. Later in the day, he was thirsty and wanted a drink. The lid of his coke bottle was very tight, so he used his shirt to open the bottle. He forgot that pesticides often stay on your clothing. The shirt had been contaminated with the fungicide and by drinking from the bottle the man poisoned himself. Within one hour he became very sick — and he was taken to a hospital. **The man is okay now, but no one knows what the long-term effects of this poisoning will be.**

Precautions with pesticides

Most people do not take the right precautions because it is too hot, uncomfortable, or they do not have the right equipment handy. However, one hour of discomfort is better than years of sickness. Keep extra clothes, gloves, boots, and soap handy at the nursery. If you do not have them, more than likely you can wait one day to apply the chemicals when you have the correct safety materials.

- Wear a long-sleeved shirt and full length pants.
- Wear rubber gloves.
- Wear a nylon or plastic apron over your clothes.
- Wear rubber boots.
- Your pants should go on the outside of the boots.
- Your sleeves should be on the inside of the gloves.
- Wear a hat.
- Wear a mask, preferably with a filter; if not available, use a bandanna.
- Wear protective glasses.

Keep extra clothes, gloves, boots, and soap handy at the nursery.

Precautions when mixing chemicals

The most dangerous time to work with pesticides is during the mixing process. The poison in a powder or liquid form is very concentrated and very dangerous. Therefore, always mix the chemicals and water outside (not in a closed storage area), but sheltered from the wind so that it does not blow away or onto your body.

If possible, use different sprayers for the different pesticides. For example, use one only for herbicides, one only for fungicides, and one only for insecticides. If you do not have several sprayers, ensure that your equipment is meticulously clean after each use because left over herbicide will kill your seedlings when you spray them with an insecticide or fungicide a while later. Check the sprayer with clean water before filling with the chemicals to make sure it is working well, and that it does not leak. Have everything handy before you start to mix: some scissors to open bags or bottles, measuring cup, clean water and a stick for stirring.

Read the label, or ask someone else to explain it to you. Make easy-to-follow instructions and post them on the doors of the storage shed, so that the right amount is used every time. Do not use more pesticide in the mixture than the amount recommended on the



Always wear protective clothing when applying pesticides. The man in the top figure is properly prepared, the man in the bottom figure is not protected; he is risking his health.

label. Making the pesticide too strong will not make it work better. Also, never use less than what is recommended on the label. Using pesticide solutions which are too weak allows some of the insects or fungi to survive. The next generation will be resistant to the pesticide and will be very difficult to control in the future.

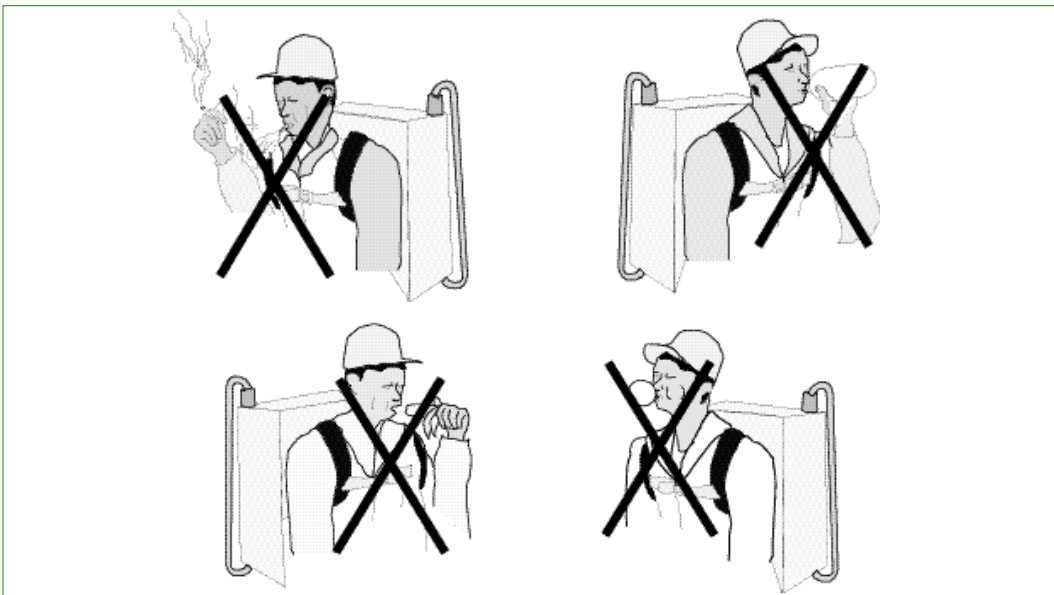
Mix only what you will use that day. If you do not use it all, but think you might use it within a few days, clearly label a container with the name and concentration of the chemical inside it. ***Never leave pesticides without proper labelling in the storeroom.***

Precautions when spraying pesticides

Spray early in the morning before the strong winds, or late in the afternoon when the wind has died down. Never apply pesticides on windy days. Do not spray when it is raining.

Never eat, drink or smoke when you are spraying. Make sure other people are not near the area where you are spraying, especially children. Do not let anybody touch the plants until the leaves have dried completely.

If chemicals were used to disinfect the substrate, wear gloves when filling it into containers. If no gloves are available, then let the soil sit at least five days with some, but not too much, water so that the chemicals can start to break down.



Pesticides commonly enter through the mouth if you smoke, drink or chew gum.



Proper pesticide disposal in a deep hole, far from a water source. Cover it well with soil.

Pesticide disposal

A *good nursery practice* is to discard leftover chemicals. Try to exchange chemicals with other nurseries to limit disposal problems. Expired chemicals should be discarded because they are no longer effective. First, ask in the chemical store where you bought the pesticides if they will take back unused portions or expired chemicals. It may be the law that they accept these chemicals.

Burning chemicals or their containers is not safe disposal. Never reuse chemical containers. Frequently, the only way to dispose of chemicals is to dig a hole and put the chemicals and their full or empty containers in it. The hole should be at least 3 m deep; it must be far away — at least 800 m from where people live and at least 1 km from any water sources. It should always be on the slope **below** the well, pond or river. You may have to leave the nursery to find an ideal spot, but you must make sure nobody will dig up the hole to plant food crops for the next 10 years, if possible! ***It is your responsibility to dispose of pesticides in a responsible manner, avoiding harm to people, especially children.***

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Cleaning up

After applying chemicals you must immediately clean yourself with soap and lots of water. Do not work all day and then wash only when you get home. The nursery should provide soap and water for washing. If there is no soap, bring it from home, and bring clean clothes unless you live close by so that you can go home to wash and change clothes.

- Clean your safety equipment each time. Dirty clothes and gloves do not protect you!
- Clean the sprayer with soap and lots of water at least 3 times. Always clean the sprayer after use, regardless of how late it is. Do not leave it until you need it again.
- Dry all equipment thoroughly in a windy place and store in a safe place.
- Wash your whole body with soap.
- Wash your hair and clean under your finger and toe nails.
- Do not mix the clothes you wore while working with pesticides with other clothes for washing. Wash these clothes separately.

Summary of safe pesticide use

The safe use of pesticides is YOUR responsibility, and so is your health. By adhering to a few simple rules, the dangers of using chemicals can be greatly reduced. Safety clothes should always be used.

Good nursery practices

- make safety part of your normal work routine, and make your safety your responsibility
- insist that you be provided with safety materials
- prepare and plan ahead of time — you can always delay application if necessary
- read instructions and ask for help if necessary
- mix chemicals in a well-ventilated area
- wear long sleeves, pants, gloves and a mask when applying pesticides
- keep extra clothes in the nursery and change clothes immediately after spraying
- wash immediately, keep soap handy
- dispose of leftover chemicals in a responsible manner

Poor but unfortunately common nursery practices

- joking about safety
- risking your health
- accepting chemicals without safety equipment
- rushing, and forgetting your safety equipment
- mixing the chemicals in too high or too low concentrations
- working in a closed room
- eating, smoking, chewing gum or drinking while applying pesticides
- continuing to work in the same clothes after spraying