



The Basics of Weed Science

Weed: A plant growing out of place.

So you think you have a weed? Do you know what plant it actually is? The first step in weed management is identifying the “weed.” You can check out books at the library, search on the Web, www.rice.rutgers.edu/weeds/index-thumbnaill.asp or www.psu.missouri.edu/fishe/default.htm or take a healthy looking specimen to your local extension office.

Once you identify the plant, you can find out the plant’s life cycle, and then figure out the best option for control.

Many weeds can be controlled with inexpensive cultural methods — digging, pulling, mowing, crop rotation, and good grassland management. Well-managed land and healthy, desirable crops and grass make it more difficult for weeds to compete.

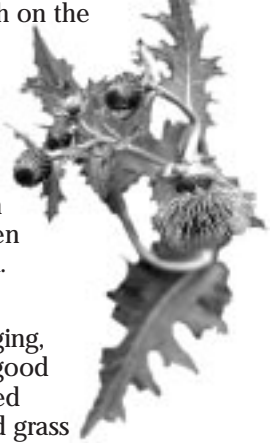
A few weeds, such as musk thistle, can be managed with biological methods, primarily beneficial insects. Scientists and researchers are continually working on improving this method.

A third option to consider is the use of chemical herbicides. Proper weed identification is the place to start when thinking of herbicides. Next, select a herbicide that will specifically kill that weed. The herbicide label will list all the weeds it controls. Advice on herbicide selection can be found at the local extension office, Noxious Weed Department, or chemical dealers.



The Basics of Herbicides

The number one rule involved in herbicide use: is Read the label. The label lists crops or places where the herbicide use is legal, what plants/weeds it will control, environmental precautions, personal safety precautions, proper rate and mixing directions, and weather conditions for safe application.



Herbicides are made up of various chemicals that have individual and unique properties. Herbicides can be purchased as wettable powders, granules, and liquids. Some herbicides work by contact and are absorbed through the leaves and stems, while others are soil-applied and are absorbed through the roots or by seedlings.

Some herbicides will kill just about any growing plant — these are called nonselective herbicides. Others are more specific and may affect mostly broadleaf plants, or mostly grass-type plants. The K-State *Herbicide Mode of Action* bulletin C-715 has more information on how herbicides affect plants.

The label on a herbicide container offers a wealth of helpful information. Take time to read it before handling the product.



Safe and Effective Herbicide Application

The label is again the place to start when discussing herbicide application. It includes mixing instructions, application rates, surfactant requirements, and other use information.

Drift is always a concern when herbicides are applied with a sprayer. Drift can result in the waste of product, reduce the effectiveness of application, damage non-target crops, and hurt wildlife or contaminate water supplies.

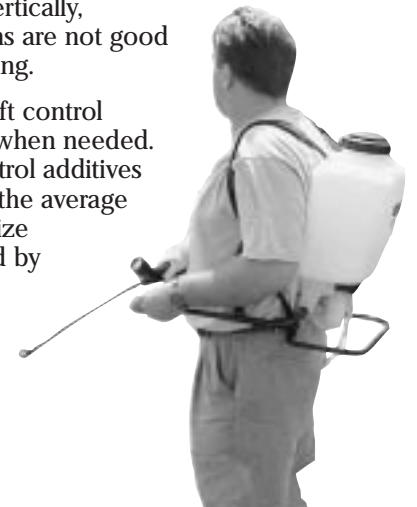
There are two basic types of drift.

Vapor drift is when herbicide molecules volatilize (evaporate into the air) and move downwind with the airflow. This form of drift is related to the product, not to the type of application method.

Particle drift is the movement of spray particles, or droplets, formed during application. Several key factors determine if a spray droplet hits its target or drifts downwind: droplet size, equipment and method of application, and wind speed and other climatic conditions.

Here are eight ways to reduce drift.

- 1) Select a nozzle that produces coarse droplets. Use droplets that are as coarse as practical to provide necessary coverage. Examples are turbo flood or turbo flat-fan.
- 2) Use the lower end of the pressure range on your sprayer. Higher pressures generate many more small droplets. Under most conditions, do not exceed 20 psi. pressure.
- 3) Lower sprayer boom height. Wind speed increases with height. Keeping the sprayer nozzles closer to the target lowers chances of off-target drift.
- 4) Increase nozzle size. Larger capacity nozzles reduce drift. If you use nozzles that put out 10 to 15 gallons per acre, increase size to nozzles that put out 15 to 20.
- 5) Spray when wind speeds are less than 10 m.p.h. More spray moves off target as wind speed increases.
- 6) Spray when wind is moving away from sensitive crops.
- 7) Do not spray when the air is very calm. Calm air, or an inversion, reduces air mixing, which means spray can move slowly downwind. Inversions generally occur in early morning or near bodies of water. You can recognize an inversion by observing a column of smoke. If the smoke does not dissipate, or if it moves downwind without mixing vertically, conditions are not good for spraying.
- 8) Use a drift control additive when needed. Drift control additives increase the average droplet size produced by nozzles.





Avoiding Damage to Sensitive Crops

Many fruits, vegetables, field crops, and even trees and shrubs are sensitive to herbicides. Herbicides such as 2,4-D, trichlopyr, dicamba, and picloram may drift in particle or vapor forms that injure sensitive plants a mile or more from the application site.

When herbicides are applied under windy conditions, temperature inversions, high temperatures, low humidity, or in close proximity to sensitive crops, there is potential for damage.

A grape vineyard that is mature and in full production can represent an investment of \$50,000 per acre. One incident of spray drift can destroy the vineyard.

The herbicide label includes all the safety precautions an applicator should follow when using that herbicide.



Herbicide applicators are legally responsible to use all chemicals according to the label and can be held liable for off-target damage.

Suggestions for preventing sensitive crop injury include:

- Visit with your neighbors and learn the locations of sensitive crops. The Kansas Department of Agricultural Pesticide Program sponsors a Web site where growers of sensitive crops can list locations. Applicators are encouraged to check the list before making herbicide applications: www.accesskansas.org/kda/Pest&Fert/sensitivecrops.htm.
- Avoid the use of ester formulations of phenoxy herbicides in any area near sensitive crops. Examples are 2,4-D and Banvel.
- Follow label directions closely.
- Use proper equipment and clean the equipment thoroughly after use.
- Follow label directions for herbicide container disposal.

- Watch weather conditions before and during herbicide application. Do not apply herbicides in windy conditions or when wind direction is toward sensitive plants.
- Spray in the fall if possible. Many broadleaf pasture weeds, such as thistle, will translocate the herbicide into the root system much better in the fall than in the spring. And, many sensitive crops are not actively growing in the fall.



Cooperating Agencies and Where to Go for More Information

Kansas Department of Agriculture Pesticide Program

109 SW 9th St
Topeka, KS 66612-1280
785-296-3786
Sensitive Crop Location Web site:
www.accesskansas.org/kda/Pest&Fert/sensitivecrops.htm

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2004 Throckmorton Hall
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Kansas Fruit Growers
www.kansasfruitgrowers.com

Kansas Vegetable Growers
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The Rookie's Guide to Responsible & Sensible Herbicide Use

- When, Why, How
- Application Tips
- Herbicide Behavior
- Avoiding Non-Target Damage
- Being a Good Neighbor