

Dear garden enthusiast:

Thank you for contacting Dow AgroSciences about damage to your garden plants. The following information will help you and Dow AgroSciences determine if one of our herbicides, aminopyralid, might be involved.

We want you to know that in the United States damage to garden plants from this herbicide have been extremely rare. However, Dow AgroSciences takes any possible incident seriously as part of our environmental and product stewardship responsibilities. In those rare cases where garden plants have been damaged by aminopyralid, the herbicide was introduced through animal manure that should not have been used as a garden fertilizer soil amendment.

Aminopyralid is approved for use on some food crops but can harm the growth of many garden vegetables such as tomatoes, beans and peas; therefore, it is not registered for use on home lawns and gardens. Any introduction into a garden is due to a failure to follow label directions.

HERE ARE SOME FACTS, IN ANSWER TO QUESTIONS YOU MAY HAVE.

What is aminopyralid?

Aminopyralid is a recently introduced herbicide developed by Dow AgroSciences to help control noxious, poisonous and invasive broadleaf weeds to maintain the productivity of our grasslands and rangelands, maintain safe conditions along our rights-of-way and help preserve our natural areas.

Aminopyralid was accepted for review by the U.S. Environmental Protection Agency (EPA) under its Reduced Risk Pesticide Initiative and met all guidelines for the registration of an herbicide in the United States. Under several brand names, aminopyralid is registered for use in agriculture and industrial vegetation management.

Agricultural uses include controlling weeds to improve wheat yields and livestock grazing on rangeland and pastures. In industrial vegetation management, the herbicide controls problem vegetation to improve visibility along roadsides, to reduce the risk of fires along railroad tracks, and to keep electric power flowing by preventing disruptions from vegetation growing beneath power lines. Aminopyralid is also used to control invasive weeds and some brush that threaten our native plant communities and wildlife habitat.

How could aminopyralid have gotten into the manure or compost I used?

The short answer is that it shouldn't have. Product labeling contains warnings and detailed instructions about the use of aminopyralid-containing herbicides. If these instructions are followed, aminopyralid residues should not reach your garden.

When grassland is sprayed with aminopyralid, the target weeds are killed but the grass is not affected. However, when this grass is eaten by livestock, either out in the field or as feed such as hay or silage, a small amount of aminopyralid may be found in the resulting manure.

Aminopyralid should pose no health risk to any animal that eats treated grass, but there may be enough active ingredient in the manure to damage the growth of plants that are sensitive to it, such as potatoes and legumes.

You can test your garden soil or the manure or compost you are considering adding to your garden (see bioassay instructions included with this message) for residues of auxinic herbicides, such as aminopyralid. If you believe you have manure containing aminopyralid, please [contact us](#).

Will all my plants be affected if the product is present in manure?

No. Only certain vegetables and ornamentals, including plants in the following list, are sensitive to aminopyralid residues:

- Potatoes
- Peas, beans and other legumes
- Carrots and other umbelliferae
- Tomatoes
- Lettuce, spinach and other compositae
- Dahlias
- Some species of roses

If you have planted any of these susceptible plants, but only some of them are affected and you used manure from the same source over your entire garden, it is unlikely that aminopyralid is to blame for the damaged crops.

If aminopyralid is unintentionally introduced through the application of manure or compost to garden soil, can I still eat produce from my garden?

There are many potential causes for the damage you may be seeing to your garden plants. It is important to know what is causing the effects you are experiencing before determining whether you can eat the any produce.

If aminopyralid has been introduced into your garden, and plants are showing symptoms of herbicide damage consistent with aminopyralid, but produce a harvestable yield, these inadvertent

aminopyralid residues are at a level low enough that you can eat the produce from the garden. Produce from the garden cannot, however, be sold.

Keep in mind, however, that there may still be contaminants in the manure used (e.g. bacteria such as *E. coli*) that you need to consider in making your determination of whether to eat the produce.

How can I help to make the soil that has been treated with affected manure or compost OK for planting sensitive plants?

Aminopyralid decomposes with the help of microorganisms found in soil. Residues in manure or compost break down if rototilled into the soil and turned over regularly.

For people with concerns regarding growing of vegetables in the future, we recommend the bioassay method for auxinic herbicides that is included below.

How long does it take for aminopyralid to break down?

Aminopyralid breaks down through the action of soil microorganisms over the growing season and in many cases dissipates by the following year. However, you can only be sure that the product has completely degraded to a level that won't injure susceptible plants by conducting the bioassay method.

Actions you can take

It is a good practice to ask providers about the sources of their manure or compost.

You can use the bioassay method included below to test your garden soil or the manure or compost you have on hand before adding it to your garden.

What is Dow AgroSciences doing to help prevent these types of situations?

As a manufacturer of crop protection products including herbicides, Dow AgroSciences worked closely with federal and state regulatory agencies to develop label directions that minimize possible harm to any non-target vegetation. We continue to work with university Extension specialists, distributors, regulatory officials and retailers to train applicators on the proper use of our products and on industry best management practices. Most states require that commercial applicators be licensed or certified to use herbicides and most also require annual training to ensure that current standards are understood.

Where can you get additional information?

You can receive additional information about aminopyralid herbicide from Dow AgroSciences by calling 1-800-992-5994, use option 4; or send an email to info@dow.com.

Dow AgroSciences may ask you for permission to visit your garden to help determine whether residues of the herbicide are present and how they might have been introduced. Information such

as the source of the manure or compost you used will help us find out how it may have been introduced and take action to prevent this from happening again.

BIOASSAY FOR AUXINIC HERBICIDES IN SOIL, MANURE OR COMPOST

This methodology is designed to test samples of soil, manure or compost for presence of auxinic herbicides that may be detrimental to sensitive crops that may be planted in that soil or planted where the manure or compost is used as a soil amendment.

In addition to any questions you may have about the possibility of herbicides in your manure or compost, gardeners should also be aware of the general precautions relating to the use of manure in gardens. The following is guidance provided by the University of Minnesota Cooperative Extension <http://www.extension.umn.edu/distribution/horticulture/M1192.html> when using fresh manure as a soil amendment.

“Fresh manure is high in soluble forms of N, which can lead to salt build-up and leaching losses if overapplied. Fresh manure may contain high amounts of viable weed seeds, which can lead to weed problems. In addition, various pathogens such as *E. coli* may be present in fresh manure and can cause illness to individuals eating fresh produce unless proper precautions are taken. Apply and incorporate raw manure in fields where crops are intended for human consumption at least three months before the crop will be harvested. Allow four months between application and harvest of root and leaf crops that come in contact with the soil. Do not surface apply raw manure under orchard trees where fallen fruit will be harvested.”

Note: The following bioassay is designed to test only for auxinic herbicide residues and not other substances.

Materials needed

- 4- or 5-inch flowerpots
- Plastic saucers
- Noncontaminated soil (loam texture) or potting mix
- Plastic bags
- Labels for pots
- Disposable gloves
- Crop seed — garden pea seeds or beans (variety not specified) or the intended garden plants
- Photographs of plants showing herbicide damage

Method to be followed

1. Insect larvae found in fresh manure, compost or soil may feed on planted crop seeds or seedlings, so try to remove larvae from samples to be tested.
2. Manure or compost samples should be placed in a clean bucket and mixed with an equal volume of loam soil or potting mix that does not contain herbicides.
3. Use clean plastic bags to mix each manure or compost sample with soil or potting mix to avoid cross-contamination.
4. If testing garden soil, collect soil samples from several representative spots throughout the garden and then combine and thoroughly mix the samples.
5. Fill 4 pots with the soil to be tested or the manure or compost potting medium mixture, tapping the bottom of the pots several times on solid surface (countertop) to settle mix.
6. Label pots.
7. Each pot should be placed in a separate tray or on a saucer to eliminate cross-contamination when pots are watered.
8. Additional pots containing only soil or potting mix not contaminated with herbicide with no manure or compost should be prepared to serve as a noncontaminated control.
9. Position pots in random order on the bench.
10. Space pots far enough apart to avoid splashing media from one pot to the next during watering.
11. Once pots are prepared and in place, they should be watered and left to stand for 24 hours before test crop is planted.
12. Plant 4 seeds in each pot by pushing seeds into the mix so they are just under the surface. To avoid potential transferring any residues between pots, change gloves between planting seeds in separate pots or wash hands thoroughly between planting in the different pots.
13. Water each pot carefully to avoid splashing and washing pot contents onto bench.
14. Keep pot contents uniformly moist, but not excessively wet.
15. Minimize water leaching into tray or saucer. If excess water drains into tray or saucer, allow it to be re-absorbed back into the pot.
16. If possible, maintain consistent growing conditions with 12 hours light and supplement with fluorescent grow lights as needed.
17. Temperature in the area where plants are growing should not drop below 50 F at night.

Plant Injury Assessments

- Compare plants grown in pots that contain soil or the manure or compost potting medium mixture suspected of containing herbicide with plants grown in potting mix or soil that is not contaminated with herbicides.
- Observe the planted crop for symptoms of herbicidal activity, such as poor stand (effect on seed germination), chlorosis (yellowing), necrosis (dead leaves or shoots), or cupped or curled leaves (refer to soybean photographs as examples of these symptoms).
- If herbicidal symptoms do not occur, the test crop can be grown.

- If there is apparent herbicidal activity, do not plant the intended crop. If there is evidence of an auxinic herbicide injury then another option is to plant a grass crop in the garden.
- Plants should be assessed at emergence and then at least at weekly intervals until they have 3 true leaves or more.

If your garden soil bioassay shows signs of plant damage, mixing the soil, such as by rototilling, can help accelerate herbicide breakdown by increasing the activity of the soil microbes that naturally break it down. (Note that plant damage can indicate the presence of several other herbicides.) If herbicide-damaged plants have been growing in the garden, spread them out evenly in the garden before mixing the soil.

Soybeans – No Herbicide Injury Symptoms



Soybeans – Auxinic Herbicide Injury Symptoms

