

Pesticides: Shelf Life and Storage Requirements

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One of the most frequent questions I am asked is how long is a pesticide good for or how long should I keep a pesticide? Pesticides used in the landscape are manufactured, formulated and packaged to specific standards. However, when stored improperly, they can break down in storage, especially under conditions of high temperature and humidity. Some pesticides can lose their active ingredients through chemical decomposition or volatilization. Dry formulations (i.e., wettable powder) can become caked and compacted; emulsifiable concentrates can lose their ability to form emulsions. Some pesticides become more toxic, flammable, or explosive as they break down.

Pesticide Shelf Life

Pesticide formulations that contain low concentrations of active ingredients generally lose effectiveness faster than more concentrated forms. Sometimes a liquid pesticide develops gas as it deteriorates, making opening and handling containers quite hazardous. In time, the gas pressure may cause the container to rupture or explode.

Certain pesticides have a characteristic odor. A strong odor in the storage area may indicate a leak, spill, or improperly sealed container. It may also be a clue that the pesticide is deteriorating because the smell of some chemicals intensifies as they break down. If none of these problems are found, chemical odors can be reduced by installing an exhaust

fan or lowering the temperature of the storage area.

Pesticide product characteristics that affect shelf life:

- The formulation (liquid concentrate, wettable powder, granules)
- The types of stabilizers and emulsifiers used
- The chemical nature and stability of the material
- The type of container and its closure

Pesticide Containers

Pesticide containers (including fiber and metal drums, pails, cans, bottles, bags, boxes, overpacks, and liner) have an important effect on storage and shelf life. If stored for long periods, these containers may eventually corrode, crack, break, tear, or fail to seal properly. Also, the label may become illegible.

If a damaged container is found, transfer its contents to a similar sturdy container that can be sealed. Be sure to transfer the label to the new container. Never put a pesticide in a food or drink container!!!

Pesticide Storage Area

Pesticides can have an extended shelf life if the storage area is cool, dry, and out of direct sunlight. Protection from temperature extremes is important because heat or cold can shorten pesticide shelf life.

At temperatures below freezing, some liquid formulations sep-

arate into their various components and lose their effectiveness. High temperatures cause many pesticides to volatilize or break down more rapidly. Extreme heat may also cause glass bottles to break or explode.

Small amounts of pesticides should be stored in a locked cupboard or storage cabinet out of the reach of children. Pesticide exposure is still a major cause of poisoning in your children. Larger amounts of pesticides should be secured in a locked room or shed that is well lighted and ventilated, constructed of fire-resistant materials, contain a sprinkler system, and have firefighting equipment on hand. A lot of stored chemicals should be filed with the local fire department.

The storage area should be in an area where flooding is not likely and is downwind and downhill from sensitive areas such as homes, play areas, and ponds. Site runoff and drainage should be considered as well so that surface or underground water supplies are not contaminated. Keep storage facilities away from human or livestock habitation to avoid contamination in the event of fire. Weatherproof signs stating **Danger Pesticide Keep Out!** should be attached to the door and/or windows.

Pesticides that are packaged in paper or cardboard containers should be stored on shelves to keep them away from water or dampness on the floor. To prevent cross contamination, separate volatile herbicides and other pesticides. Keep all corrosive chemicals

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PESTICIDES**HERBICIDES**

Bensulide (Betasan, Bensumec)

Granules are stable. Emulsifiable liquids may crystalize below 42°F, but crystals redissolve if stored or warmed at high temperatures.

DCPA (Dacthal)

Store in a dry place. Wettable powders are stable for at least two years under proper storage conditions.

Dichlobenil (Casoron, Barrier, Dyclomec)

Granules are stable for at least two years if tightly sealed and stored in a cool, dry place.

Glyphosate (Roundup)

Store above 10°F to keep from freezing, which results in crystals that settle to the bottom of the container. Do not store, mix, or apply in galvanized steel or unlined steel containers.

Simazine (Princep)

Wettable powders and granules are stable for at least two years under normal conditions. It is nonflammable.

Trifluralin (Treflan, Preem)

If stored for long periods below 40°F, emulsifiable concentrate formulations may give poor weed control. Its flash point is 119°F, so do not store near a heat source. It is stable for at least two years with cool, dry storage.

INSECTICIDES

Carbaryl (Sevin)

Repeated freezing/thawing cycles may decrease effectiveness of flowable formulations. Wettable powders are quite stable under normal storage conditions.

Diazinon

Use 4E within six months of opening the container. Do not store near a heat source. Keep lids tightly closed; keep granular materials and dusts dry.

Dimethoate (Cygon, De-Fend)

Liquid formulations should be stored above freezing temperatures. It is flammable, so keep away from heat and open flame. Its flash point range is 73°F to 100°F.

Malathion (Cythion)

Wettable powders are stable for at least two years when stored properly. Do not store liquid formulations below 0°F. Keep away from heat sources.

MITICIDES

Dicofol (Kelthane)

Wettable powders are stable under normal storage conditions.

FUNGICIDES

Captan

It is stable for at least two years under normal storage conditions. Protect it from extreme heat.

FUMIGANTS

Metam-sodium (Vapam)

Do not store below 0°F. It crystalizes at lower temperatures. Warm or store at higher temperatures and mix to redissolve crystals and assure uniformity before use.

Pesticides...

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in their proper containers to prevent leaks. Even the simple step of tightly closing lids and bungs on a container can help extend the shelf life of pesticides.

You should build a drainage system to collect any runoff water contaminated with pesticides. Pesticides that may be present in tank rinsing, spills, seepage from storage, and heavy runoff from fire-fighting or floods must be controlled. Dikes, collecting pools, and washing slabs with sumps provide a proper drainage system. All the collected runoff water should be treated as a surplus pesticide and disposed of properly or reused in pesticide application.

An adequate supply of detergent or soap, hand cleanser, and water is essential in the storage area. Water also serves as quick first aid in a poisoning emergency. A shower should be available as

first aid for pesticide spilled on the skin. An emergency shower that will release a large amount of water at once is preferred so that any pesticide is immediately flushed off the body in case of an accident. An eyewash station should be nearby as well.

Absorptive clay, activated charcoal, vermiculite, pet litter, sawdust, or specialized pesticide-absorbent material should be readily available at the storage site to soak up spills and leaks. Hydrated lime and sodium hypochlorite (Clorox or other bleach) should also be on hand, as they may be used to neutralize many pesticides in an emergency. Other essential items include a shovel, broom, dustpan, leakproof container to hold spilled pesticide, and the proper type of fire extinguisher.

Table 1 contains a list of some of the more common pesticides and their specific storage and stability requirements.

Buying Suggestions

One way to minimize loss, cost, and disposal problems associated with pesticide costs is to avoid mixing more pesticides than you will use in a reasonable period of time. Be sure to date the container and keep a current inventory of supplies. Avoid stockpiling; buy what you need, but not to excess.

Even with careful planning, it is sometimes necessary to carry pesticide stocks over from one year to the next. Check dates of purchase at the beginning of each season and use the older materials first. To keep the label on a container intact and legible, cover it with transparent tape or lacquer.

Given proper storage, some pesticides may remain active for a number of years. By following the above guidelines, you can maximize their shelf life and your investment. ■

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