Product Safety Assessment

**Glyphosate**


Select a Topic:

**Names**
- CAS No. 1071-83-6
- GLYPHOSATE™
- N-(phosphonomethyl)glycine
- DURANGO™
- ACCORD™
- VANTAGE™
- PANZER™

**Product Overview**

- Glyphosate is a nonselective, foliar-applied systemic herbicide which controls a wide variety of annual, biennial and perennial grasses, sedges, broadleaf weeds and woody plants. Globally, it is currently registered and marketed by many different companies including Dow AgroSciences LLC, a wholly owned subsidiary of The Dow Chemical Company. For further details, see Product Description.
- Glyphosate is a white to off-white solid. For further details, see Product Description.
- Glyphosate has many uses, including: a burndown herbicide for no-till crop production, broad spectrum weed control in glyphosate-tolerant crops, general vegetation control in non-crop and industrial areas and range, pasture improvement/renovation, and as a herbicide on a wide variety of fruit, nut and vegetable crops. For further details, see the country-specific Product Label, Product Uses or Contact Us.
- Those working in manufacturing, packaging, or distribution operations could be exposed to glyphosate. Applicators may be exposed to glyphosate during field application. Workers using glyphosate-based products must wear proper protective equipment and follow label instructions carefully. For further details, see the country-specific Product Label, Product Uses or Contact Us.
- Contact with glyphosate is essentially non-irritating to skin. Very low toxicity if swallowed. May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns, to the eye, may occur. For further details, see Health Information or the Safety Data Sheet.
- Glyphosate is practically non-toxic to birds on an acute basis, and slightly toxic on a dietary basis. It is slightly toxic to aquatic organisms on an acute basis. For further details, see Product Label.
- Glyphosate is stable under recommended storage conditions. Exposure to elevated temperatures can cause products to decompose. Consult the Product Label for specific use and storage information.

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**Manufacture of Product**

- **Capacity** – Dow AgroSciences, a wholly owned subsidiary of The Dow Chemical Company, manufactures glyphosate products at facilities in the United States of America and other countries.
- **Process** – Glyphosate is produced using proprietary processes and materials. The chemical structure is shown below:

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HO\ |\ N\ |\ P\ |\ OH
\ /\   \ /\   /\   \
O    \   O    \   O
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**Product Description**

- Glyphosate is the common name for N-(phosphonomethyl) glycine, the active ingredient in several herbicides registered to Dow AgroSciences LLC. It is formulated and sold under several trade names, such as Durango®, Accord®, Vantage™, and Panzer™.
- Glyphosate inhibits EPSP (5-enolpyruvoylshikimate-3-phosphate) synthase, a plant enzyme involved with production of aromatic amino acids. Plant death results because of the deregulation of plant carbon metabolism.

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**Product Uses and Regulatory Information**

Glyphosate products are registered for use on a global basis. Glyphosate is registered in many countries in the following geographical areas: Europe/Middle East/Africa, Latin America, North America and Pacific Region, for weed control in agricultural crops and non-agricultural sites and is registered for use on a variety of fruit, vegetables, and field crops as well as for aquatic and terrestrial uses.

Glyphosate has been comprehensively evaluated under regulatory frameworks used for registration and approval of herbicide products in several countries, including the United States. These legal frameworks require both laboratory and field testing to determine the potential for use to result in human health or environmental impacts.

Regulations exist that govern the manufacture, sale and distribution, transportation, use, and/or disposal of Glyphosate products. In addition to federal regulation, additional regulations may apply which vary by state or locality. Information may be found by consulting the relevant Product Label, Safety Data Sheet, or Contact Us.
Exposure Potential

Glyphosate is used in the production of commercial herbicides. Based on uses for Glyphosate, the public could be exposed through:

- **Workplace exposure** – Exposure could occur in a facility that manufactures or formulates Glyphosate. Those working with Glyphosate in manufacturing operations could be exposed during maintenance, sampling, testing or other procedures. Each manufacturing and formulation facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit exposure. Agricultural workers could be exposed while applying this product in the field. Wearing proper protective equipment and following label instructions will reduce the potential for exposure. See [Health Information](#) and [Product Label](#).

- **Consumer exposure to products containing Glyphosate** - The Environmental Protection Agency (EPA) concluded in 2013 that, when Glyphosate is used as directed on the label, there is a reasonable certainty that no harm will result to the general population or to infants and children from aggregate exposure to Glyphosate residues. See [Health Information](#).

- **Environmental releases** – For spills, please consult the country-specific [Safety Data Sheet](#) or [Product Label](#) for more information about protective equipment and procedures. See [Environmental, Health](#) and [Physical Hazard Information](#).

- **In case of fire** – Consult the country-specific [Product Label](#) and [Safety Data Sheet](#) for specific firefighting measures. Follow emergency procedures carefully. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).

**Emergency response information** – In the case of an emergency such as poisoning, product spillage, or fire associated with a Dow AgroSciences product, please use the phone number listed on the Safety Data Sheet for the appropriate country.

In some countries, the Emergency Response number is also provided on the label on the package.

For more information, see the [Product Label](#) or [Safety Data Sheet](#).

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Health Information

**Laboratory testing** – Glyphosate has been evaluated by comprehensive regulatory guidelines and registered and approved for sale and use in the United States and other countries. These guidelines require laboratory testing for potential acute, short-term (sub-acute and sub-chronic) and long-term (chronic) health effects. These tests help scientists determine how chemicals might affect humans, domestic animals, or wildlife in cases of overexposure. The amount of pesticide to which people and pets may be exposed is very low compared to those used in laboratory testing.

Health information for formulated glyphosate products is summarized on country-specific [Safety Data Sheets](#). It is important to note that potential health risks associated with individual products may vary based upon their formulation or intended use. Formulated products may contain solvents, minor components or other additives. These SDSs are a preferred source for specific health information as product formulations may differ. For further details, also consult the country-specific [Product Label](#).

**Eye contact** – May cause severe eye irritation, with corneal injury, which may result in permanent impairment of vision, even blindness. Chemical burns, to the eye, may occur.

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**Skin contact** – Essentially non-irritating to skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts.

**Inhalation** – Excessive exposure may cause irritation to upper respiratory tract (nose and throat).
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**Ingestion** – Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

**Repeated exposure** – Glyphosate demonstrated low oral subacute and subchronic toxicity in animal studies. Significant adverse effects are not anticipated.

**Developmental, reproductive and genetic information** – Glyphosate does not have the potential to cause developmental or reproductive or genetic toxicity. Glyphosate has been toxic to the fetus in laboratory animals at doses toxic to the mother. In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

**Carcinogenicity** – Glyphosate did not cause cancer in laboratory animals. Weight of evidence evaluation of human epidemiology studies supports no association between glyphosate exposure and cancer.

For more information, see the Product Label or Safety Data Sheet.

**Environmental Information**

Glyphosate exhibits low volatility from soil and plant surfaces. Studies have demonstrated that glyphosate adsorbs strongly to soil and is considered immobile to leaching. Glyphosate is readily degraded by soil microbes, and exhibits moderate persistence in aerobic soils. Glyphosate is stable to hydrolysis and subject to a moderate rate of photolytic breakdown in sunlight in aquatic systems. Available data indicate that glyphosate is not likely to bioaccumulate in the tissues of non-target organisms.

Glyphosate is slightly toxic to fish and other aquatic organisms on an acute basis. Material is practically non-toxic to birds on an acute basis and slightly toxic on a dietary basis. Toxicity tests show glyphosate is practically non-toxic to honeybees.

For more information, see the Product Label or Safety Data Sheet.

**Physical Hazard Information**

Glyphosate is stable under recommended storage conditions. Exposure to elevated temperatures can cause product to decompose.

Consult the Product Label for specific use and storage information. Some products may be combustible because of the solvents used.

For more information, see the Product Label or Safety Data Sheet.
### Additional Information - includes links to the SDS, Contact Us, Labels, etc.

- Contact Us ([http://www.dowagro.com/company/contact/index.htm](http://www.dowagro.com/company/contact/index.htm))

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### References


For more business information about Glyphosate, visit the Dow AgroSciences website at [http://www.dowagro.com/](http://www.dowagro.com/).

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**NOTICES:**

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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