Master Gardeners of Ontario Facebook Group

Why We Don't Recommend Cayenne Pepper (Capsaicin)

Home gardeners sometimes recommend sprinkling cayenne pepper on soil to deter animal pests, e.g., squirrels eating tulip bulbs. There are a number of concerns regarding this practice. First, let's take a look at products which contain cayenne/capsaicin.

Commercial Products Which Contain Capsaicin

Capsaicin is the compound that gives chili peppers their heat. Capsaicin is used in various forms. Registered products typically display helpful information to the public. **What's in the product? How and where the product can be used safely? First aid information: What should I do if it gets in my eyes, mouth, lungs or on my skin?**

- **Cayenne pepper**: Culinary product made from ground up chili peppers to give foods a hot or spicy taste.
- **Pepper spray** - personal deterrent spray used for self-defence or managing combative individuals.
- **Animal repellents** containing capsaicinoids and similar functioning piperine (oil of black pepper) are registered to repel vertebrate pests such as rabbits, squirrels, deer, voles, raccoons, cats, dogs, and skunks. These repellents "stick" to the sprayed surface and will not get into the eyes of animals or pets.
- **Products to Inhibit Invertebrates:** Capsaicin is also used to inhibit certain invertebrates (e.g., insects, spiders, millipedes). As with most chemical options, it should be chosen only when the damage done exceeds thresholds of concern and when other less harmful options have been fully explored. In gardens, most insects are beneficial and just eat other insects. Spiders and millipedes perform important ecosystem functions and should not be killed.
- **Treated Birdseed:** Capsaicin is added to bird seed to deter animals such as squirrels from eating the seeds. Birds are not harmed by capsaicin. They cannot taste capsaicin and will not be repelled by it. There are warnings on the product to avoid contact with eyes, nose and skin.

Concerns About Using Cayenne Pepper in Gardens

Animal Cruelty Issues

Cayenne pepper can get into the eyes and nasal passages of animals who dig into the soil where the cayenne is sprinkled. Similar to a pepper spray, the cayenne will cause extreme burning pain in both eyes and nose.

> "Capsaicin produces its repellent effect when it contacts either eye or respiratory tract mucus membranes. Signs of acute exposure include coughing, inability to vocalize, and temporary blindness." **Capsaicin Technical Fact Sheet**

> "When applied topically, capsaicin produces an immediate inflammatory reaction in mucous membranes. In the eye, it produces blepharospasm probably caused by irritation of corneal nerves, extreme burning pain, lacrimation, conjunctival edema, and hyperemia. In animal studies, it has also been shown to produce miosis and aqueous flare… In the nasal mucosa, capsaicin produces burning pain, sneezing, and a dose dependent serous discharge…. In dogs, direct administration of extratracheal capsaicin aerosol has been shown to produce apnea, bradycardia, and hypotension." **Personal Defense Sprays: Effects and Management of Ocular and Systemic Exposure**
> https://core.ac.uk/download/pdf/212801372.pdf

Non-Target Impacts of Capsaicin

Because cayenne pepper is not meant for use in the garden, there are numerous non-target impacts that gardeners may be unaware of:

- Capsaicin is **toxic to bees** and other beneficial insects.
- Capsaicin will **inhibit or kill** spiders, millipedes and other insects, most of which are beneficial in the garden.
- In **animals**, capsaicin causes coughing, temporary blindness, and prevents the vocal cords from working for a short time.
- **Pets** may be harmed by capsaicin if they walk on surfaces sprinkled with cayenne pepper or dig in the affected soil.
- Capsaicin is toxic to some bacteria. Bacteria are essential soil organisms.
- Cayenne pepper should not be used near ponds as it may be toxic to aquatic life.

> "In insects and mites, it [capsaicin] appears to damage membranes in cells and disrupt the nervous system. Capsaicin is toxic to bees and other beneficial insects. According to Gervais, J. A. ; Luukinen, B.; Buhl, K.; Stone, D. 2008. ***Capsaicin General Fact Sheet***; National Pesticide Information Center, Oregon State University Extension Services. http://npic.orst.edu/factsheets/capgen.html.
>
> "The **capsaicin** lethal dose for Apis mellifera **bees** is greater than 100 µg per individual." (Flesar, J., Havlik, J., Kloucek, P., Rada, V., Titera, D., Bednar, M., and Kokoska, L. (2010). In vitro growth-inhibitory effect of plant-derived extracts and compounds against Paenibacillus larvae and their acute oral toxicity to adult honey bees. Veterinary Microbiology, 145: 129-133. doi.org/10.1016/j.vetmic.2010.03.018.)

What Can Gardeners Do?

There are other options for gardeners to protect tulip bulbs and other garden plants.

Physical barriers: Squirrels seem to be attracted to the recently disturbed soil when you plant tulip bulbs. Place a barrier over the planting holes immediately after planting: chicken wire, inverted strawberry baskets, wooden planks or clay saucers are all very effective.

Clay saucers placed over bulbs will deter squirrels. Saucers can be removed in the spring before bulbs emerge.

Plant Deeper: Plant your bulbs deeper. Squirrels will only dig so deep before giving up

Repellents: Commercially made products have capsaicin as an ingredient, but are formulated so that animals won't get the product in their eyes. Repellents can be used on other plants preyed on by animals. Read directions carefully as all are not recommended for food plants.

- There are two kinds of repellents: **contact** and **area**.
    - **Area repellents** are applied **near the plants** and repel by **smell** alone.
    - **Contact repellents** are applied **directly on the plants** and repel by **taste**.
    - **Contact repellents** have an extremely bitter and unpleasant taste. They should not be used on food, edible plants, or directly on the fruits or nuts of trees. Do not use them on sugar maple trees if the sap is being used to make syrup, since the taste of the maple syrup may be affected.
- **Repellents** need to be kept fresh for maximum effectiveness.
- There are several brands of animal repellents to choose from that are helpful in deterring deer, rabbits & other animals. Some of the commercially available repellents are:
    - **Bonide Rabbit-Deer RepellentTM** - It produces a very bad taste. Can be sprayed or brushed onto plants.
    - **HinderTM** - A soap-based product that repels by odour. It needs to be reapplied after heavy rain.
    - **Ro-PelTM** - This has both odour and taste repellent properties. Spray it on both sides of the leaves of landscape plants.
    - **PlantskyddTM** – This is effective for up to six months for controlling deer, rabbits, voles and other small animals and does not to be reapplied after watering or rain.
    - **BobbexTM** - Deer and rabbit repellent and will also deter small animals. Can be used as a bulb-dip to prevent underground damage after planting.
- **Pelleted Hen manure** has been found effective sprinkled on the soil where bulbs are planted.

References

- Capsaicin Technical Fact Sheet
  http://npic.orst.edu/factsheets/archive/Capsaicintech.html#uses

- ***Capsaicin General Fact Sheet***; National Pesticide Information Center, Oregon State University Extension Services. http://npic.orst.edu/factsheets/capgen.html.

- GREEN WITH ENVY: Stop squirrels from stealing your bulbs https://www.toronto.com/opinion-story/69589-green-with-envy-stop-squirrels-from-stealing-your-bulbs/
- EPA R.E.D. Facts for Capsaicin:
  https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-070701_1-Jun-92.pdf
- Capsaicin and Related Capsaicinoids (based on the Science Evaluation of this consultation document and Evaluation Report ERC2012-03, Capsaicin: Technical Fact Sheer: National Pesticide Information Center http://npic.orst.edu/factsheets/archive/Capsaicintech.html