

# Alarmed About Armadillos?

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Armadillos are rather unusual looking animals that belong to a family of mammals found primarily in Central and South America. The earliest fossil ancestor of our North American armadillo is from the Paleocene; it was as large as a rhinoceros. Our present-day armadillo, *Dasypus novemcinctus*, is much smaller; adults normally weigh from eight to 17 pounds. The species ranges from Texas eastward throughout the South; its range is expanding rapidly northward into Missouri and eastward into South Carolina. However, cold weather will limit the further expansion of the northern boundary of the armadillo's range.

## Description

Armadillos have a shield-like shell that is covered with horny scales. Joints in the shell are flexible, which enables the animal to bend and twist. Only the ears and belly of the armadillo are without bony armor. These peculiar animals have 28 to 32 peg-like teeth in simple rows well back in the mouth. There are no front teeth. Armadillos have poor eyesight and hearing, but a keen sense of smell. Both male and female are about the same size, look alike, and have similar habits.

## Reproduction

Although armadillos may breed in late July, the five-month gestation period is somewhat delayed which results in the young being born in February or March. Only one litter is produced each year, and it always includes four identical young of the same sex. The young look like the adults except that they are smaller and their armor coat remains soft and leathery for some time, becoming harder with age.

## Typical Habitat

Armadillos inhabit dense shady cover, such as brush, woodland or pine forests. They frequently rest in a deep burrow during the day and become much more active during the night, early morning, or late evening. Burrows which are located under brushpiles, stumps, rockpiles, or dense brush, are usually seven to eight inches in diameter and up to 15 feet long. Armadillos usually have several burrows and depend upon their ability to escape danger by running to the nearest burrow. Despite their awkward appearance, armadillos are agile runners and good swimmers — and even have the ability to walk underwater across small streams.

## Feeding Habits

These animals feed primarily on insects and invertebrates,

including ants, grubs, and earthworms. Armadillos usually root or dig in ground litter in search of food, but will occasionally eat berries and mushrooms. Reports of armadillo damage to birds' nests on the ground are rare.

## Damage Caused

As a result of foraging activities, armadillos dig numerous burrows and holes in lawns, flowerbeds, gardens and pastures. The burrowing in pastures poses a potential hazard to cattle. Armadillo damage, which is both costly and unsightly, has caused increasing concern for homeowners, farmers, and ranchers. Armadillos are, to some degree, beneficial because they eat insects and larvae. But to most people, these animals are a nuisance to private properties. There are a number of ways of controlling damage by armadillos.

## Methods of Control

If armadillos are causing damage to yards, flowerbeds, or shrubbery, it may be necessary to initiate preventive measures or to control local individuals or populations to reduce the damage. Preventive and control methods suggested include:

1. chemical treatment of soils to reduce the local food supply,
2. use of repellents,
3. erection of barriers (e.g. fences),
4. use of live traps for capture and relocation
5. fumigation of burrows, and
6. shooting of offending individuals.

Since the use of chemicals such as chlordane and heptachlor, and the use of steel traps has been legally restricted, control measures must be modified accordingly. A chemical which discourages armadillos from digging in lawns and gardens by killing insects is diazinon (available in granular form with either 5% or 10% active ingredient). Diazinon, used at a rate of 40 pounds of 10% granules or 80 pounds of 5% granules per acre on lawns and around gardens, usually provides considerable relief from the digging activity of armadillos. For best results, these granules should be applied just prior to a rain, or the treated area should be thoroughly watered soon after treatment. All children and pets should be kept off the treated area until it has completely dried. It takes about two weeks following treatment for granular diazinon to become effective. In using this chemical, be sure to follow all precautions and restrictions on the label.

It has been suggested, but not thoroughly tested, that moth  
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balls sprinkled in the yard or garden are effective as a repellent for armadillos. Also, where the damage is localized, small fences (10-12 inches high) may be used to keep the animals out.

Armadillos can be trapped in live traps (such as available from Havahart, P. O. Box 551, Ossining, NY 10502) or in homemade box type traps. Animals caught in these traps can be released unharmed into another area several miles away. Traps should be located near the entrance of armadillo dens or burrows and baited with spoiled or overripe fruit (e.g., apples, pears, etc.). If other species of animals get into these live traps, they can be released unharmed.

Fumigating burrows with toxic gases is another technique to reduce armadillo damage. This technique, however, is suggested only as a last resort due to the secondary poisoning hazard for other animals (gopher tortoises, lizards, snakes), which frequently seek shelter in burrows. The fumigation technique to control armadillos is usually chosen only if the burrow or den is located a short distance from the site of the damage. The armadillo is most likely to be using its den during midday and therefore this is the best time to use a fumigant or gas.

One fumigant that is easy to use, quite safe and effective is carbon disulfide. Carbon disulfide usually can be obtained at local farm-supply stores or possibly, the local drug store. This substance is best utilized by soaking a wad (softball-sized) of cotton or rags with carbon disulfide, and then placing the cotton or rags as far down the burrow as possible. Cover the den immediately with sod or heavy soil. Toxic fumes from this material will kill the armadillo (and sometimes, other animals) if it is inside the burrow. CAUTION: Do not use carbon disulfide near an open flame as it is a highly flammable material.

Carbon monoxide gas from internal combustion engines also can be used as a fumigant by attaching a hose to the exhaust, extending the other end of the hose as far into the burrow as possible, and closing off the entrance around the hole with compacted soil. Exhaust fumes should be expelled into the burrow for at least 20 minutes to kill the armadillo. This technique is not highly recommended since it also may result in a secondary poisoning hazard to other animals using the burrow.

Poison baits are not recommended; they are poorly accepted because of the armadillo's feeding habits and present another secondary poisoning hazard to other animals. One other method is frequently employed to control offending armadillos — and that is spotting them at night and shooting them. Make sure shooting is legal and safe in your area. The shot should be directed toward the animal's head, as these animals are difficult to kill otherwise. Remember that armadillo meat is edible if properly prepared and there is no bag limit or season on them.

If one of the above control methods is ineffective at discouraging or eliminating the offending armadillo(s), a combination of these will likely be more effective.

## Scientist Defends Use of 2,4-D

*The following is from a letter sent to the chairman of the Santa Cruz County board of supervisors about a hearing it held last October 30 on the possibility of banning use of 2,4-D. The board of supervisors voted to place a moratorium on the herbicide's use by the department of public works until additional information and testimony could be considered. Two more hearings were held, again with the same results. At the most recent hearing (December 11) the moratorium was continued until June at which time the county agricultural commissioner, county director of the extension service, and the department of public works have been asked to make recommendations on replacement herbicides and the "use of IPM in weed control." The writer is Dr. Kenneth Thimann who enjoys a worldwide reputation as a biologist, plant physiologist and bio-chemist. He is the possessor of a list of academic achievements and honors that is far too long to present here. The important thing insofar as this letter is concerned is that he is one of the world's true experts on the subject. — Editor*

My name is Kenneth Thimann and I am professor emeritus of biology at the University of California-Santa Cruz. My speciality is plant biology and in particular the plant growth regulation substances (of which 2,4-D is one). I have written some 250 scientific papers and five books on this and related topics. I do not work for any firm that makes or sells 2,4-D (or indeed any other pesticide) and my sole interest in this matter concerns the truth.

2,4-D is the most generally useful of all herbicides. Its discovery arose from the work on natural plant hormones, to which it is related and not from the Army, as was claimed on Tuesday. This, by the way, was only one of some dozens of falsehoods to which I listened that evening. 2,4-D is the most generally useful herbicide because of three valuable properties: it is harmless to man, it is rapidly destroyed by bacteria in the soil (and to non-toxic breakdown products), and lastly it has the special ability to kill broadleaved plants (technically dicotyledons) without harming the narrow-leaved group (monocotyledons), a group that includes the grasses, wheat, barley, corn, rice, etc.

Thus it is most useful for killing weeds in corn or wheat; its use in Britain in the immediate post-war years is credited with causing a 30% increase in overall wheat yields. It has been in regular use throughout Europe and North America since about 1948; i.e. for 31 years, and in that time the only damage to humans ascribed to it, as far as I know, was to a few who deliberately drank it for suicidal purposes. Even then it has been hard to absorb a fatal dose.

It stands to reason, therefore, that the tiny amount one might take in from the spatter of a sprayer, etc., could not possibly exert a harmful effect. The man who claimed that, while working for the parks department he had sprayed some 2,4-D and the following day he "and all his team" had

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