

Good Things to Know about Worm Castings

This is an overview of benefits known about worm castings. The overview is generated from information disseminated by such major Universities as Ohio State, Cornell University and UC Davis. This information also comes from other institutions and companies such as the California Vermiculture, LLC and the Australia SIRO. Their research goal was to establish the value of worm castings. Their test results have shown improved flower size, bloom quantity, quality, and color. Fruit and vegetable tests results have shown yield improvements from 15% to 57% as well as improvements in taste and appearance.

The information you need to know and consider is presented below in a list format, which we believe is easier and quicker to reference and grasp. Some of the discoveries made will surprise you. Most people will be amazed by the following information if they have no prior exposure to the absolute beauty and completeness of the worm casting.

**Basic points to start:**

Worm Castings are the worm feces. *The castings are made up of live biological organisms. The organisms include fungi, actinomycetes[[1]](#footnote-1) , beneficial bacteria, pseudomonads[[2]](#footnote-2) , plant growth regulators, yeasts, molds, trace elements and the famous N-P-K ratings used by fertilizers, to reference the* ***N****itrogen,* ***P****hosphorus and* ***K*** *(which is the chemical symbol for Potassium) quantities promoted by the fertilizer industry (more on this below).*

Worm Castings are harmless to plants (in any dosage), pets or children. You cannot ‘burn’ a plant by over use of casting, even if not watered properly. Pets and children alike can play in castings without any more damage than normal dirt.

Castings have no odor themselves. There is a slight fresh dirt odor that comes from the dirt in which the castings were created, but in fact, castings do much to retard odor from other sources.

**Fascinating Facts To Know:**

**Safe To Use – Anywhere at Anytime:**

Castings are pathogen free and play a significant role in cleaning up the soil they are placed in. They are safe to use around pets and children both indoors and outdoors. There is no requirement for a license to spread castings, even if done by a professional company on your private land. You cannot over load plants, shrubs, grass or vegetables even if you plant them in 100% castings. Castings need water to activate but failure to water immediately will not burn plants as fertilizers are known to do. Use in home environments for a safe, no-odor, easy care soil enhancement that will reduce plant demand for water.

**Improved Plant Growth:** Extensive university plant growth research has shown improved plant size, bloom quantity, quality, and color for flowers. Fruit and vegetable tests have shown significant yield increases as well as improvements in taste and appearance. Ohio State University research showed that the optimum ratio of worm castings to native soil is 10-20 percent. In our own growing test plants grown in 100% earth castings seem to grow no better than those grown in the 20% range.

**N-P-K:** Worm castings test low on a normal soil report. The nitrogen level of Wormgold® tests at less than 1 percent. Phosphorous tests around 1 percent or lower. Potassium tests slightly higher than 1 percent. These levels appear to be low but all of the nutrients in a casting are in a form that is readily available for use by the plants. This low test is a critical point in today’s advertising promotions that higher and higher NPK ratings are needed to grow plants. That is true within chemical fertilizers only! Castings achieve the same or higher rates of growth without the high concentrations of NPK that is now known to be an environmental hazard to our waterways and soils. Castings provide a successful and balanced growth to all plants without overuse of any one nutrient.

**Fungus Control:**  Four major university research projects and testing have shown that the complete soil food biology found in worm castings will quickly control fungus problems on a long term basis. Fungus is an important part of healthy soil, but causes nitrogen lock-up and other problems when it gets out of control. Since fungus-eating protozoa and fungus-eating nematodes are found in the worm castings using worm castings as a part of the soil mix will control fusarium, rhyzoctonia, phytophthora, and sclerotinia fungi. They also provide improved plant growth with the release of excess nitrogen as the soil fungi are brought into balance. Within a few weeks plants suffering from fungus problems will show significant improvement that lasts. All ground fungus is quickly brought under control. Nitrogen is released in the fungus control process providing added plant growth. (This is published research information and can be given to buyers in a generic form).

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**Biological Decomposition:** The decomposition rate of many biological materials is dramatically increased with the addition of worm castings. Testing has shown the decomposition of prawn and crab shells is doubled when worm castings are added to the soil medium. These shells cannot become valuable in the soil until they are fully decomposed.

**Beneficial Nematodes:** Some nematodes are harmful and others are beneficial. The harmful nematodes are root eaters that can destroy plants and ‘switcher nematodes’ that eat fungus then switch to consuming roots. ‘Beneficial nematodes’ on the other hand are fungus eaters and aid in plant health. Research by Dr. Elaine Ingham at the Soil Foodweb, Inc. lab in Corvallis, Oregon, has shown that worm castings have only the beneficial fungus-eating nematodes.

**Soil Softening:** Soils can become hardened with the reduction of beneficial soil biology. This limits fertility. Adding worm castings provides the biology needed to return the soil to a softened state. Within a few weeks, the hard soil is workable, allowing ease of plant growth.

**Insect Repellency:**  Testing has shown that several microorganisms found in worm castings stimulate the organisms in plants that work as repellants for a large array of insects. The repellants increase to a level where the insects find the plant nectar distasteful. The insects then leave. The effectiveness has been seen for aphids, white fly, and other bugs that feed on the plant juices. Plants tested included but are not limited to: begonias, various citrus, hibiscus, various house plants, morning glory, roses, solanum, and zylosma. The numbers of individuals who have had successful applications of castings to control insects now exceed 1,500. This research is on-going. A patent application to use castings as a base for insect repellent is in process as well as a bio-pesticide registration.

A key element for insect repellency is the level of chitinase-producing organisms. Chitinase is an enzyme that will dissolve chitin. The exoskeleton of bugs is made of chitin [so obviously they don't want to hang out where their skeletons will get dissolved!]. Bugs have various detection mechanisms to determine the level of chitinase in plants and soil. Once the chitinase level is high enough, they will leave the area. Worm castings test with a very high level of chitinase-producing organisms.

Also, some elements in worm castings are able to activate the chitinase-producing organisms found inside plants. Once triggered, these organisms multiply to a level that can be detected by the insects. The repellency effectiveness has been tested and confirmed for white fly, aphids, spider mites and various other bugs. Twenty various plants have been tested showing effectiveness.

The rate of repellency is in direct relation to the size of the plant. Spider mites will leave houseplants in about 2 weeks, aphids leave roses in about 6 weeks, and white flies will leave full sized hibiscus in about 3 months. Fire ants and common ants can detect the natural repellency organisms when they walk over worm castings. They find the worm castings highly objectionable. An immediate negative reaction can be seen by ants when worm castings are applied. The ants leave areas covered with a 1-inch layer, but will begin to walk across the layer after a few weeks. Apparently some change happens to the top layer. Red fire ants will leave their nests within 24 hours of a single application.

**Odor Elimination:**  Testing has shown that worm castings are very quickly effective at odor elimination. Mix 10% - 20% worm castings with composted dairy manure, horse manure, chicken manure, or compost and all objectionable odors are eliminated within eight hours. You can now use these effective organic fertilizers without offending odors. Worm castings have been tested for odor absorption against activated charcoal and were found to be more efficient and economical *(1/2 the cost)* as activated charcoal.

 **Worm Casting is not compost:** Worm castings are not actually compost; certainly not in the normal sense. The vermiculture process is **not a ‘hot’ process** like normal composting. Rather it is done at cooler temperature levels since it is done by digestion within the worm. This allows for a wide range of beneficial microorganisms to survive the process and become helpful to the overall benefit of the casting. In fact, the digestion process in the worm adds to the casting a complete list of biological organisms that includes up to 10,000 different species – no small feat!! They each do their part in making the life of the plant healthier, easier to access and use needed nutrients from the soil and the casting itself. Worm castings can help facilitate composting both in time and in odor control, but they are not within themselves compost.

Some of the sources for this paper are:

www.organicrosecare.org/articles/worm\_castings.php

www.hiddenvalleynaturearts.com/acatalog/wormcast.htm

and our own experience.

 Without Worms, It’s just Dirt!

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|  Increases drought resistance | Reduce irrigation cost up to 50% | No ground water contamination |
| Improves soil structure by having shaped particles that improve aeration | Allows plants to quickly and easily absorb all essential nutrients and trace minerals | Improve crumb structure of soil for a better movement of air and water to the plants. |
| Castings actually contain a perfect mix of nutritional needs | Castings build soil biology and enhance it greatly over the years  | Outside Apply as a top dress of ½ inch to 1 inch layer on all plants. |
| Naturally Odor Free! In fact, castings can reduce odor when applied to other substances. | You can’t make castings hurt you, your children or your pets. Use worry free! | Potted plants? Use castings at the rate of 20% by volume of the potting soil. |
| Stores for years in a moderate temperature and humidity. Use bags that allow it to breathe – there are living organisms in your worm castings. (**But** why store what can be helping you grow?) | For row crops in garden, simply side dress the rows. |

1. actinomycetal ac'ti•no•my•ce'tal (-mī-sēt'l) or ac'ti•no•my•ce'tous Any of various filamentous or rod-shaped, often pathogenic microorganisms of the order Actinomycetales that are found in soil and resemble bacteria and fungi. [↑](#footnote-ref-1)
2. Pseudomonads Any of various gram-negative, rod-shaped, mostly aerobic flagellated bacteria of the phylum Pseudomonad, commonly found in soil, water, and decaying matter and including some plant and animal pathogens. [↑](#footnote-ref-2)