

# Worm Castings Act as ‘Super Humus’

Don and Glenda Spiker, Wheeler, Illinois

## Use of Worm Casting Extract in Ag Production

Coordinator: Don Spiker

Location: Wheeler, Illinois

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Don and Glenda Spiker found ways to reduce the use of synthetic fertilizers and fungicides by applying liquid casting extract from worms. He compared three application systems.

Most people associate manure with the smelly confines of a hog barn. Few people picture earthworms. Yet worms provide what some argue is one of the most effective, natural, and environmentally friendly fertilizers to be found.

The business is called vermiculture, and its popularity is growing—for good reason. Don and Glenda Spiker apply a liquid “casting extract” (castings are earthworm manure) through the irrigation system at golf courses in combination with foliar feeding. And they have shown that the product has “tremendous potential” to reduce the use of both synthetic fertilizers and fungicides.

“We reduced the cost of maintenance over \$40,000 a year on an 18-hole course,” Don Spiker notes.

With this success behind him, Spiker wanted to see if worm-casting extract could also be used to reduce costs in row crop production while decreasing dependency on synthetic fertilizers and pesticides. Therefore, he received a SARE grant in 2004 to do just that on 20 acres of soybeans and 20 acres of grain sorghum. On the grain sorghum land, he compared three application systems (see figures 1, 2, and 3).

As these figures indicate, the extract strips without additional side-dressed nitrogen had slightly lower yields than the other two application systems; but it had the greatest net return per acre. The strips with no extract had the lowest net return per acre.

According to Spiker, however, the extract did not show any advantage when used on the soybean land. Also, the tests to see if



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the worm-casting extract increased microbial diversity in the soil were inconclusive. Nevertheless, he believes the extract has the potential to increase microbial populations, which should make more of the fertilizer that is already in the soil available to the plant.

Meanwhile, the soil tests confirmed what Spiker had noted in two previous years. Almost all of the tests showed higher nitrogen levels on the grain sorghum land where the extract was applied.

“You cannot make conclusions on one year of tests, but it does warrant more study,” he says.

As Spiker puts it, the casting extract may not be a miracle cure for the row crop farmer, but it has “the possibility of being able to reduce the amount of fertilizers being applied to the land.”

The Spikers began their venture into vermiculture in December of 1998 after deciding to sell the stock from their 150-sow, farrow-to-finish hog operation when the hog market crashed. Then in late 2003, Spiker began working with Larry Martin of Vermitechnology Unlimited to develop a worm-casting extractor, which turns the castings into a liquid that can be sprayed on the crops.

They give their worms a ground feed mixture, and as this material passes through the worm, it is altered both chemically and physically, Spiker says. The result is a “super humus” product that contains rich proportions of water-soluble nutrients and a high concentration of beneficial bacteria and microbes, he says. The football-shaped particles also improve aeration and allow for excellent drainage so roots don’t become waterlogged or develop root rot.

Don and Glenda Spiker live on their 230-acre family farm (Don’s father purchased the first 80 acres in 1940) and today market worm castings to golf courses, vegetable and flower greenhouses, retail customers, and organic farms across the United States. They also sell worms in the bait and composting market and manufacture worm-casting extractors.

When you use this odorless, non-burning product in greater concentrations than usually found in nature, Spiker says, “The results are truly spectacular.”

By Leanne Lucas

Figure 1. Extract Strips

100 gallons of worm-casting extract.....	\$3.70 per acre
40 pounds per acre, 28% nitrogen pre-plant .....	\$16.00 per acre
Total cost of nitrogen sources per acre .....	\$19.70 per acre
Yield per acre.....	130 bushels
Price per bushel.....	\$2.33
<b>Gross per acre.....</b>	<b>\$302.90</b>
<b>Net per acre.....</b>	<b>\$283.20</b>

Figure 2. Extract/Sidedressed Strips

100 gallons of worm-casting extract.....	\$3.70 per acre
40 pounds per acre, 28% nitrogen pre-plant .....	\$16.00 per acre
40 pounds per acre, 28% nitrogen side-dressed.....	\$16.00 per acre
Total cost of nitrogen sources per acre .....	\$35.70 per acre
Yield per acre.....	133 bushels
Price per bushel.....	\$2.33
<b>Gross per acre.....</b>	<b>\$309.89</b>
<b>Net per acre.....</b>	<b>\$274.19</b>

Figure 3. No Extract Strips

40 pounds per acre, 28% nitrogen pre-plant .....	\$16.00 per acre
80 pounds per acre, 28% nitrogen side-dressed.....	\$32.00 per acre
Total cost of nitrogen sources per acre .....	\$48.00 per acre
Yield per acre.....	134 bushels
Price per bushel.....	\$2.33
<b>Gross per acre.....</b>	<b>\$312.22</b>
<b>Net per acre.....</b>	<b>\$264.22</b>