Turning the Brown Gold to Yellow Gold
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Compost is a typical nutrient amendment used in small-scale agriculture, while large scale, mono-crop agriculture often is dependent on synthetic N-P-K fertilizers. Dan Hunsicker, a non-organic corn grower in Berks County, Pennsylvania, grows continuous corn in a no-till system without organic amendments or cover crops.

While attending Rodale Institute's annual on-farm field day in Kutztown, Pennsylvania, Dan learned about the benefits of amending soil with high-quality compost produced aerobically throughout the composting process, and how well it could improve soil health and plant yield. In the past few years, Dan realized that his corn yield is not as high as he anticipated. Therefore, he wanted to investigate whether the use of **compost** or "**brown gold**" produced at Rodale Institute, would re-energize his soil to increase corn yield.

In 2013, Rodale Institute scientists and Dan received a Northeast SARE Partnership grant to demonstrate the impact of using high-quality compost with and without compost extract on soil physical and chemical properties as well as corn grain yield. As a farmer collaborator on the project, Dan allowed Rodale's research team to use his land for the research study, and provided his equipment and time.

Compost extract prepared at Rodale Institute and provided to Dan for application at corn planting

Fertilizer tanks filled with compost extract and injected in soil at corn planting

Dan prepared the land and three weeks before planting, researchers applied high-quality compost, prepared at Rodale Institute, at the rate of 1 ton per acre on plots designated for compost treatment. For treatments with compost extract, Dan retro-fitted his planter for compost extract application at planting. These plots also received two applications of compost extract (one- and two-months after planting) using backpack sprayer.

Application of compost extract: one- and two months after corn

Dan was personally involved in the entire project and eagerly awaited the results from the soil and plant samples collected by the research team as well as yield data. Soil was sampled throughout the season and analyzed for physical and

chemical properties. At harvest, plant and grain samples were obtained by sampling the whole plants and corn ears from 20-foot long strips in two adjacent middle corn rows. Dan harvested the remaining plants for grain.

Hand and combine harvesting of corn.

After only one cropping season, soil bulk density in the combined compost and compost extract treatment was 87 lb/ft^3 (1.39 g/m^3) compared to 90.5 lb/ft^3 (1.45 g/m^3) in the treatment without organic amendments (Dan's standard practice). In addition, the percentage of soil organic matter in the combined organic treatment was 3.41% while in Dan's standard practice, it was 3.07%. Lowering soil bulk density reduces compaction and increasing soil organic matter potentially enhances soil biological activity, chemical reactions, and soil physical structure which are all indicators of soil health.

While there was no significant increase in plant biomass between treatments, the compost treatment increased corn grain yield by 10 bu per acre. Dan refers to **corn** as the "**yellow gold**". He sells his corn to the pet industry which requires higher quality corn for a premium price ($5.50 a bushel on average). This equates to an additional $45.00 per acre in revenue or $165,000 annually for Dan's 3,000 acre operation.

Dan was very pleased with the results of the field trial, and predicted that if he continued to use high-quality compost with extract year after year in his no-till corn system, he can enrich his soil with organic matter, improve soil structure and increase his corn yields without a doubt. With time, he potentially could reduce using petroleum-derived fertilizers and turn to organic amendments for feeding his soil microorganisms and plants. Dan is also interested in modifying his sprayer to apply frequent applications of compost extract during the growing season to boost corn production. Dan is now on the path of turning **"brown gold"** into **"yellow gold"** for more **"green"** by adding organic amendments to his no-till system.

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