



Welcome to Ground Work

*Previously we have stated that Biological Farming is managing soil air, water, and residue with biology. AgriEnergy Resources' **Residue™** is live microbes that will break down mature crop residues. Proper residue management is at the heart of Biological Farming.*

Good residue management is an effective way to improve soil biology, by increasing the total numbers and diversity of beneficial soil organisms necessary for building organic matter and growing vigorous crops. Good residue management is the management of crop residues in a manner so that they decompose quickly enough to build soil humus levels and so that crop residues become advantageous for the next crop.

The key concepts of good residue management include:

- inoculate the crop residue with **Residue™**
- provide an environment and food sources for the organisms to thrive
- manage carbon to nitrogen ratios
- put the residue in contact with the soil

Inoculate. **Residue™** is used to inoculate residues with live microbes and provide food sources to jump start their attack on the tons of residue many crops leave behind. The residue left behind is the soil's most valuable asset if handled properly. Rapid results with **Residue™** follow some kind of

incorporation into a well aerated soil containing proper amounts of calcium. Further acceleration of residue to humus can be obtained by sizing the residue with cutters or choppers. Based on your soil type, topography (highly erodible or not) and your climate (warm or cool) we can customize the speed of microbial decomposition that fits your farm.

Food sources. **Residue™ Plus Liquid** provides nutrients to start your microbes. To initiate rapid growth of carbon digesters we provide nitrogen, sugars and traces. This gives some immediate nutrition to start the humus conversion process.

Carbon to nitrogen ratios. Mature crop residues such as cornstalks and wheat straw have particularly wide C:N ratios. Cornstalks can be 50 parts carbon to 1 part nitrogen. This ratio will be narrowed to 12:1 by microbes to form humus. Microbes being 60% protein require significant nitrogen. If time is short to degrade the residue, such as a late harvest, then additional nitrogen with a **Residue™** program is important.

Tillage. **Residue™** being a live microbial package requires the residue to be in contact with the soil. Standing residue will not degrade into organic matter and humus. We need the residue at least touching the soil. Proper tillage on your farm depends on your soil type (sand, silt or clay), your topography (flat or rolling), and your climate (warm or cool). On sandy soil in the South, proper tillage might be rolling or dragging to knock residue down to the soil. On clay in the North, it might be a mini-moldboard plow. Proper tillage is the practice that grows the most microbes per acre on your farm.

Benefits of **Residue™**

One of the advantages of a successful residue management program is having less residue to till and plant into for the following crop. This means that less tillage is necessary to prepare a seedbed. In many cases it has meant that farmers can use a field cultivator rather than a disc. Having less residue to contend with means better spacing and placement of the seed and better seed-to-soil contact, both of which promote a more uniform stand. Less residue also allows the soil to warm up faster which means quicker emergence.

A common observation is improved soil tilth where **Residue™** was used. One of the byproducts of microbial respiration is the production of polysaccharides, a biological glue that forms and holds water stable soil aggregates together. The result is a "coffee grounds" soil tilth that allows better water and air infiltration. This improved soil tilth creates a superior seedbed to plant into allowing better seed-to-soil contact under a variety of planting conditions. This improved soil tilth means there is better gas

exchange in the soil, allowing oxygen to go into the soil and carbon dioxide, methane and other gases to exit the soil.

Another common comment from long time Biological Farmers is that better soil tilth means fewer trips to obtain a seedbed and less horsepower is required for tillage. It is common to pull tillage tools a gear or two faster than on neighboring fields that have not been farmed biologically.

Typical yield increases from **Residue™** have been 12 bushels per acre for corn and 5 bushels per acre for soybeans. Other benefits will be discussed in upcoming articles. This can be a very profitable part of your total crop management program.

Residue™ is available liquid or dry. **Residue™** is available for organic production.

Contact us! info@agrienergy.net. (815) 872-1190.