



Welcome to Ground Work

Biosanitation

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“Biosanitation” is a term AgriEnergy Resources coined a few years ago to describe **the practice of actively managing soil microbiology to rapidly degrade pesticide and disease carryover.**

Herbicide carryover is a yield stealer. It can be dramatic like a stalled center pivot system where the water keeps flowing and the herbicide injection tank keeps pumping. But it is more frequently a subtle yield stealer that causes unseen damage to roots that in turn shaves off yield.

For example, in a Missouri study soybean yields dropped by 2 or 5 bushels where the previous corn crop had been treated with atrazine. The two bushel loss was on acidic ground; the five bushel loss was on soil with a pH of 6.5. This particular example is especially discouraging because most bean growers would like to lime an acid soil, but doing so would exacerbate the atrazine carryover problem. However there is something we can do to prevent atrazine, and many other herbicides, from carrying over and causing hidden yield loss. And, incidentally, doing so in conjunction with a calcium application is especially effective.

This picture is an example of a severe Sencor (metribuzin) carryover in spring barley due to an accidental doubling of that herbicide the previous year. **Residue™** was applied through a center pivot two weeks before this picture was taken and the difference is obvious. The stunted area did grow out of its damage but yielded 40 bushels less than the area treated with **Residue™**.



As Roundup Ready varieties have come to dominate the planted acreage of corn and soybeans in America, a lot of the old herbicide carryover problems have receded into the background. Yet professional agricultural magazines now openly discuss the increasing need, because of glyphosate resistant weeds, to include other herbicide chemistries for Roundup Ready crops. This partial return to other chemistries will bring back some of the herbicide damage, like bottle brushing in corn, that we used to see more often.

So too is there increasing concern about the problems of glyphosate (and its breakdown product AMPA) buildup in the soil. Though this is a very controversial subject it seems clear that there is real reason for concern. Glyphosate is a particularly tough chemical to completely break down, but is ultimately broken down by soil microbes. A well managed residue decomposition program, especially if it includes **Residue™**, is likely to do well in fields where glyphosate carryover is a concern.

Researchers who are familiar with the fate of glyphosate in the soil concur that a "firestorm" of residue degradation will do a better job cleaning glyphosate out of the soil than doing nothing. Through timeliness, good moisture, small residue particle size, good soil contact, ideally a green manure crop, and **Residue™** cultures, a microbial firestorm can be ignited in your fields to clean things up.

The other major use of Residue™ for biosanitation is within Integrated Pest Management (IPM) Systems. Particularly in those programs that address disease.

Sanitation, the physical removal of infected tissues, is a standard practice for growers who fight diseases such as Apple Scab, Pecan Blight, or Cherry Leaf Spot. Orchardists take great care each season to remove as much of the leaf litter in the fall, and prunings in the spring, as they possibly can. They seek to minimize the amount of inoculum on the orchard floors that threaten the next crop. Most definitely one should continue standard sanitation practices. But it is impossible to get every little scrap of fallen plant material picked up in an orchard. It is not impossible to inoculate every bit of what is on the orchard floor or in your fields with **Residue™**.

Not so common is to talk about sanitation in row crops. But with Goss's wilt marching across America, universities and consultants are once again talking about sanitation in row crops. Historically this was taken to mean one should get out there and moldboard plow the trash; and that works. But most growers employ reduced tillage systems and indeed AgriEnergy Resources thinks complete inversion of residues is rarely justified.

So what do we do for corn on corn where Goss's wilt or gray leaf spot is present on our residues and posing a threat to next year's crop? Rotate out? Ok, maybe in corn ground; but that's a hard choice when corn is more profitable than beans. We can have a fungicide plan ready to go, even prepay the chemical company a bunch of money. But there is more we can do. Engage in active and vigorous residue decomposition.

An ARS microbiologist stated that the fungal inoculum on fallen and dead tissues will not survive if the infected tissue is consumed by microorganisms. To create a microbial firestorm we can't just rely and wait on native organisms to get cranked up. They may not be out there in sufficient numbers (or out there at all) and we end up with a slow smoldering burn that gets some, but probably not all, of what we are targeting.

Rather we spray beneficial cellulose and lignin degrading organisms onto the residues and, preferably, get those residues into contact with the soil. Quick-starting and accelerating this cycle by even a couple weeks is quite important because there is typically a very short amount of time between harvest and freezing temperatures for this job to get done.

Biosanitation is a pro-active IPM practice to remove or reduce pesticide and disease carryovers that steal yield. AgriEnergy's Residue™ products are a way to take this practice to the field.