

AgriEnergy Resources



A new report from the country on SP-1

Randy Hughes, a crop and livestock producer in Antelope County, northeast NE, illustrates an AgriEnergy Resources principle that biologicals work best in soils with reasonable *chemical* balance — especially adequate calcium.

Hughes says, "In spring 1988, I began working with Agri Service Associates, a consulting firm then headed by Everett Dennis. I still have an early handwritten note from him advising me, 'First, buy lime!' When Everett died and his son Marc continued the firm, I remained a client."

As Hughes brought his soils into chemical and biological balance, his whole-farm corn average climbed from 120 bu. per acre in 1989 to 210 bushels.

In the past few seasons, Hughes has tested some of AgriEnergy's biological products. "In side-by-side trials two years ago, SP-1 gave us yield increases ranging from 8 to 14 bu. per acre. In 2005, the increase was 7 to 9 bu. per acre.

AgriEnergy's Bio-Aid biological product also looks promising; we're still evaluating 2005 yield data."

Hughes says that for many years he has applied hog manure where soil tests show a need.

"Higher yields — mostly from greater soil biological activity stimulated by the manure — continue on those fields for several years after the application."

Hughes adds: "One benefit of good biological activity is yield *consistency* within fields and between fields across the farm."

On his farm, the range of corn yield variations within fields has narrowed to around 30 bu. per acre, about half the variation he experienced in earlier years.

This spring, put these difference makers in your lineup!

4-21-4 — Our 4-21-4 fertilizer is a premium quality starter. It is unique because it contains extracts of compost, minerals and other carbons. 4-21-4 is low in salt and high in orthophosphates. That means it is gentle and available to young plants. It is the best starter choice for conventional and renewable farming systems.

Organic Ten — Now that Organic Ten (10-0-0) and its companion Organic Five (5-0-0) are available, you no longer have to settle for anemic crops. Your organic crops can get off to a fast start and finish strong.

Trace Pak — Trace Pak is all about nitrogen use efficiency. When soil applied, this micronutrient blend feeds the soil microbial life, which in turn feeds the crop. When used as a foliar, the traces jump-start several plant functions, including N-fixing and photosynthesis. You'll get your crop off to the races with traces!

Dramm Liquid Fish — Here's a great way to nourish and promote biological life in the soil. Dramm liquid fish fuels soil microorganisms to fix nitrogen from the air and cycle soil nutrients. In foliar applications, Dramm fish provides the vitamins, minerals, enzymes and amino acids required for increased plant health, grain quality and yield. Add Dramm fish to your starter, broadcast, foliar or side-dress. Lots of flexibility and options!

BioAid — AgriEnergy's BioAid is a dry product that coats dry fertilizers. It is very high in microbial activity and diversity, and includes bacteria, fungi, actinomycetes and algae. Now you have an option if liquids cannot be used.

Activator — This is our leading product for managing high salt levels in cropped soils. Activator is followed by periodic applications of SP-1 to maintain and reinforce the microbes which are holding sodium and chloride out of harm's way. Your crops will no longer halt because of the salt.

This dairyman uses MST on all his seed: Scott Stoller, an organic dairyman near Sterling, Ohio, reports: "I've been impressed with AgriEnergy's Myco Seed Treat; MST. I can see right to the row where it was and wasn't used. Two years ago I ran out of MST-treated seed corn, and refilled with untreated seed in a hurry. I could see a difference right to the line. Even the following year when I planted soybeans, I could see that same line in the field."

Stoller adds: "Any seed that hits my ground has MST on it. I buy a 10-lb. bucket of it in spring and use it for alfalfa, oats, wheat, barley, corn, soybeans — even garden seed. After I saw what it does, I don't even consider the cost."

Stoller's pursuit of biologically living soils is paying off in crops which generate good production and a healthy cow herd. He ships milk to Organic Valley Farms, a farmer-owned cooperative.

Mardel Robinson has returned to AgriEnergy Resources after an 8-1/2 year "sabbatical!" She was a staff member in 1988, when the first products were shipped. She left in 1997 to follow her husband to Nebraska, where he had a new job opportunity. Now the Robinsons have decided they want to return to Illinois, and we are happy to welcome Mardel back to our staff! She will again be helping with communications and special events, along with new projects.



Hatfield: Enhancing soil biology yields many benefits

In the 1950s, a national U.S. farm magazine published a series of features under the title: *Is manure worth hauling?*

The author's argument was that commercial NPK fertilizer was so cheap and effective that manure was obsolete. It's just a disposal problem.

Fifty years later, Dr. Jerry Hatfield — one of the world's leading soil scientists — is answering that old question this way:

"Manure is one of the greatest resources we have. It's under-valued. It's how we built our agricultural systems."

Dr. Jerry Hatfield directs USDA's National Soil Tilth Laboratory based at Iowa State University. His argument is that *biological recycling of crop residues, including animal manures and cover crops*, is the top priority for renewing soil life and productivity after years of cropland degradation.

"We have lost our appreciation for soil biology, conservation and good soil management. We must rediscover it. If we want consistent production, changing the soil is the first thing," Hatfield told growers at our February Renewable Farming Seminar in Illinois.

Hatfield bases his conclusions on solid research data and close cooperation with leading farmers.

He noted these benefits from soils enriched by sound conservation and a rich array of biological life:

1. Higher and more consistent crop production, especially through extremes in weather, is virtually assured with biologically alive soils.

In fields with conventional NPK fertility and tillage, Hatfield says "Many fields of corn vary from 100 to 250 bu. within the field. Farms with high conservation and residue management have *half* as much variation within the field. We have a field in western Iowa with a long-term, ideal biological and residue system. Corn yield variation within this field is only about 20 bushels."

Hatfield adds that the U.S. is likely entering an era of higher weather variability, where the soil's ability to



Dr. Jerry L. Hatfield, Director, USDA National Soil Tilth Laboratory, based at Iowa State University, Ames, Iowa

absorb moisture and release it to crop roots will be more critical.

Sophisticated research equipment for measuring soil respiration rates has revealed how carbon dioxide emissions from soil biological life can amplify yields. "About 40% of the corn plant represents CO₂ from respiration of soil organisms," said Hatfield. "We used to think this contribution was near zero. The more biological activity in the soil, the bigger the contribution of CO₂ to the crop canopy. This is especially measurable at night when there is no CO₂ uptake by the crop."

Soil biological life also improves soil aggregates and reduces soil crusting after a rain. A soil crust only 1/32 of an inch thick sharply reduces gas exchange between the soil and atmosphere. Result: The soil goes anaerobic, allowing underground pathogens to multiply.

The cure for compaction and soil crusting is not more tillage, says Hatfield: "It's *increasing soil biology* to increase aggregate stability."

Another yield enhancer: Soil with rich biological life converts available soil moisture to bushels more efficiently. An inch of soil moisture in a biologically rich soil can generate 10 bu. per acre, versus about 8 bu. per acre or less in the same soil type with less microbial and fungal life, reported Hatfield.

2. Environmental benefits result from live soils — such as reduced runoff of sediment and nutrients.

Cropland in central Iowa's Raccoon River Basin loses as much as 30 lbs. of nitrogen per acre. High nitrate levels in this river forced the municipal water system in Des Moines to build the world's largest nitrate removal plant and operate it five months of the year.

Nitrate problems showed up in this watershed only after the acreage of small grains, hay and pasture fell below 10% of total cropland. Hatfield said, "We've lost sight of what different cropping systems do in changing the water balance."

He noted that a cover crop can store 30 lbs. of nitrogen. Hatfield encouraged producers to restore small grains and forage legumes in rotations, reduce tillage, and bring back livestock so we can "capture manure and preserve its value."

He added, "We should spend more time on precision application of manure, rather than precision application of commercial fertilizer."

Long-term buildup of soil organic matter including humus — the final and most stable product of soil biology — needs more research, Hatfield observed.

"Nobody knows how much difference there is between types of conservation systems when it comes to sequestering carbon."

One fact he *has* seen: "If you want to build organic matter quicker, add some small grains and forages into your crop rotation."

"Humus is one of the last stages of the biological reactions in the field," said Hatfield. "This is what ultimately stabilizes a soil against the forces which work against it."

Summed up Hatfield: "We need to understand how to manage soil, as opposed to just putting on more stuff. Many cycles are involved — the water cycle, mineralization of nutrients, respiration, and biological cycles. *One of the most fascinating pieces of the universe we have yet to explore is the microbiology in the top foot of soil around the globe.*"

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We're enhancing our website with several new, free services!

Here's a summary of what you'll find at www.agrienergy.net today:

1. Join an online discussion board. You can share your experiences, and benefit from the experience of other leading growers. Our web visitors are just discovering this benefit and we expect the pace of postings to grow substantially.

2. You can sign up to receive the AgriEnergy Resources newsletter online, in PDF format. It's delivered faster that way, and you can store newsletters in a separate file on your computer so back issues are always easy to find. You can download the most recent newsletter in PDF format from the website, and we're developing other innovations in electronic communication to keep you up-to-date on Renewable Farming.

3. Our Soil Lab provides online forms you can download, print, and send in with your soil samples. Also, you'll see detailed information on testing fees, how we analyze soils,

and how to make the most profitable use of the results. (We can e-mail your results in PDF or Excel format.)

4. We're expanding our on-line descriptions of product information. Many have downloadable product information sheets.

5. Members of our staff give presentations and maintain display booths at a wide array of state and national farm shows, where you can visit us. Our site offers a constantly updated list of show dates and locations, including our own seminars.

6. We've added a wide array of educational information on Renewable Farming. This is aimed at growers who are learning the principles of building a living, fertile soil. We'll use this area of the site to continue publishing new research data as it becomes available.

7. The site offers a special section for organic growers.

Demand for our organic products is climbing rapidly with growth of organic food

and feed markets. AgriEnergy Resources values our personal relationships with clients very highly. If you've never met us, you can begin to get acquainted by visiting the "people" section of our site, which shows our staff.

Also under development is a series of integrated links with our regional dealers, some of whom have their own websites.

E-mail webmaster J. P. Aley with your ideas for website improvements!

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Career agronomist confirms: Calcium is "king of nutrients" for living soils

Few agronomists know soils as well as Richard E. Goff, a Certified Professional Agronomist with Midwest Laboratories of Omaha.

The central theme of his fertility presentation at our recent Renewable Farming Seminar was the need for *available calcium*. He favors gypsum as a bio-friendly source of calcium. He gave this example:

"One of my clients uses biologicals to break down stalk residue. He also applies high-quality gypsum from a Cargill processing plant at Blair, Nebraska. His cornstalks decompose quickly. Such fields are so biologically active that light snows melt above them, and in one forkful of soil you can find enough earthworms to go fishing."

On soils like that, you can plant a week earlier than the neighbors — a major advantage, said Goff.

In sugar beet areas, another good calcium source is lime waste from sugar beet processing. It has some

sugar in it. "Apply that to corn ground as needed with biologicals like Residue, and the stalks virtually disappear," Goff told participants.

One major reason to decompose stalk residue: Restore the availability of calcium locked in crop stem and leaf cells.

On most soil types, Goff advised against using dolomitic lime because its magnesium content intensifies problems with tight soils. Ask for lime sifted through at least a 100-mesh screen so more of it is available soon after application.

Soybeans in particular depend heavily on available calcium. One study showed that as calcium content in soybean plants rose, the number of disease infections declined.

"We always bought our seed potatoes from growers on high-calcium land because that seed grew the healthiest plants," Goff recalled. "To get a chipping contract in Wisconsin,

a grower must agree to apply a specified amount of high-quality calcium."

Calcium helps build strong cell walls which resist disease, and favors biological life which enhances plant uptake of all nutrients. It also helps flocculate soil colloids into larger aggregates, which helps water filter through the soil.

"Research shows that rainfall infiltration increases after application of gypsum," said Goff. "If we manage so the biological system can do its job, this system will do an excellent job of balancing soil elements for the best plant health."

One example: Earthworm castings have an ideal calcium-magnesium ratio and pH for plant nutrition. The castings increase availability of other plant nutrients as well.



Richard Goff



AgriEnergy Resources

This letter is brought to you by your AgriEnergy Resources consultant

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Chamber of Commerce honors Renewable Farming pioneer Lynn Petersen as “Agriculturist of the Year”

The Shelby County, IA Chamber of Commerce recently named Lynn Petersen of Elk Horn as outstanding “Agriculturist of the Year.”

In our winter 2004 newsletter, we reported that Lynn was one of only five Shelby County farmers chosen for a \$25 per acre annual payment under the new Conservation Security Program (CSP).

The Chamber’s presentation noted that Lynn’s farm was a perfect fit for the CSP program “Because of his wide variety of Renewable Farming practices and his great concern for conservation.”

Lynn has been using AgriEnergy products and principles since 1989.



His soil’s biological life has built up so noticeably that aerial photos show darker soils in his fields, compared to identical soil types in conventionally farmed fields nearby. Lynn achieved this with biological products and compost.

He composted organic wastes

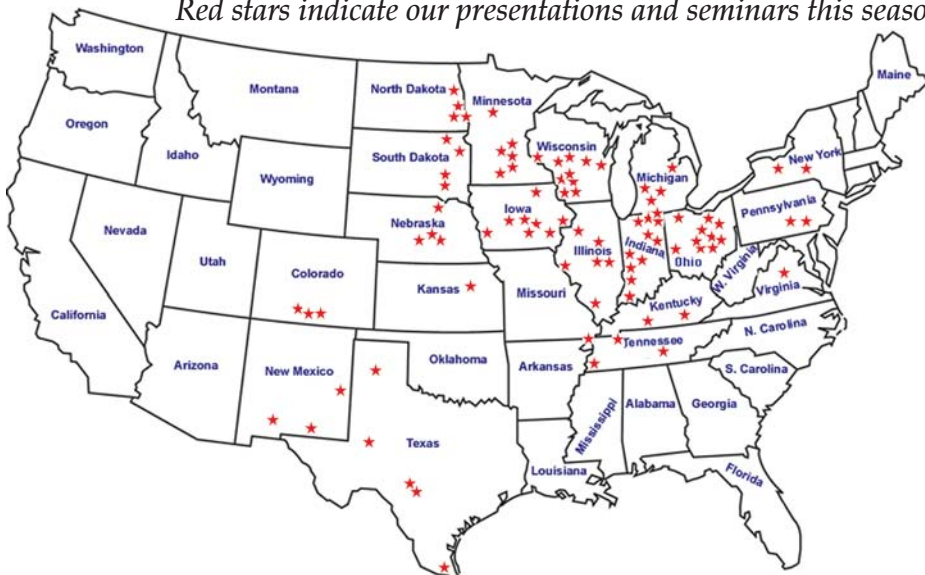
from the city of Elk Horn. This turned into a soil builder plus an extra moneymaker: He began selling compost locally.

Lynn harvests yields typical of the higher-quality soils in his western Iowa area. But his purchased nitrogen use and other input costs are lower than typical farms around him. He split-applies nitrogen on corn only as indicated by late-spring soil tests.

By digesting crop-residue carbon with Residue, SP-1 and other biologicals, Lynn has gained excellent yield consistency over the years despite western Iowa’s wide variations in annual rainfall.

We’re making every possible effort to meet you in your own neighborhood!

Red stars indicate our presentations and seminars this season



AgriEnergy Resources staff members have made presentations at more than 60 farmer conventions, shows and seminars around the country this winter.

This includes a major address to participants at the ACRES USA conference in Indianapolis, plus our own Renewable Farming Seminar in February.

We estimate that this season we’ve directly presented AgriEnergy’s people, principles and products to more than 2,000 farmers. Also, our displays have been seen by thousands more at trade shows.

Let us know of any opportunities to bring the AgriEnergy Resources message to an event near you!