

AgriEnergy Resources

Seed firm's initial trial: 6.1 bu. gain with Myco Seed Treat

Beck's Hybrids of Atlanta, IN, is well-known for some of the seed industry's most extensive, practical field research on their own plots and in cooperation with farmers.

In 2004, Beck's compared 13 soybean seed treatments, one of which contained AgriEnergy Resources' Myco Seed Treat along with Beck's own seed treatment, SureGro. In combination, the two SureGro and Myco Seed Treat replications averaged 6.9 bu. over the control, and 6.1 bu. over SureGro alone. Here's a summary of the first-year trial:

Seed treatment	Bu/Acre
Sure Gro + Myco Seed Treat	69.4
Sure Gro + Myconate	65.6
Sure Gro + Apex Pro	65.0
Sure Gro	63.6
Sure Gro + Seednique	63.3
Sure Gro	63.3
Untreated	62.5
Sure Gro + Cruiser	61.8
Sure Gro +T22	61.6
Sure Gro + Gaucho	61.2
Sure Gro + Optimize	60.9
Sure Gro + America's Best	59.7
Trilex + Allegience + Topsis	57.3
Average	62.7

The Beck's Hybrids website shows details on 2004 trials at: <http://www.beckshybrids.com> Under the "Research" tab, click on "Beck's PFR Plots" and look on pages 60-61, *Soybean Seed Treatment Study*. Scott Beck says they'll run further trials in 2005.

Applying 4 oz. of dry Myco Seed Treat per 100 lbs. of seed helps seedling roots take up water and nutrients all season.

The tendril-like hyphae of the mycorrhizal fungi become extensions of the root.

Our trials show \$1 of Myco Seed Treat on soybeans often returns more than \$6 in improved yields.

How to begin transforming your farm this season, with our help

AgriEnergy Resources consultant Ray Roettger tells farmer clients: "Learning the Renewable Farming system is like marrying a wonderful woman. It takes some adjustments at first. But the longer you're with her, the better it gets."

Many of our farmers have been with us well over a decade, and they're still gaining soil fertility, yield consistency, crop quality and cost savings.

If you're just getting started into the benefits of biologically enhanced farming, here are steps for a sound beginning this season.

1. **Send representative soil samples** to our AgriEnergy Resources soil lab for a comprehensive analysis as early as you can. We encourage the "complete" soil test, which includes a Morgan extract. It simulates the crop's ability to pick up available nutrients. Our analysis also includes key measurements of sulfur, sodium, conductivity and pH. The opening page of our website shows a link where you can get soil testing information. If you're not online, just contact us.

2. **We'll help you connect with the AgriEnergy Resources consultant** who knows your area best. Together, you can review your soil test results and select the most cost-effective approach for your first comparisons. Almost every farmer has a unique combination of soils, equipment and crops. It is the consultant's job to help you find the initial route to the best long-term system which fits you. Here are a few simple products and practices which fit the equipment of most producers:

✓ **Myco Seed Treat** is a blend of mycorrhizal fungi which live in a symbiotic relationship with crop roots. This is a product which anyone with a drill or planter can try. It's applied directly on the seed at planting. It's OMRI listed for organic crops.

✓ **SP-1** is an excellent beginning point for restoring your soil's biodiversity. It's a blend of beneficial bacteria, fungi, algae, enzymes and nutrients to support a bloom of soil microlife... your "littlest livestock." SP-1 can be sprayed with fertilizer on soil at 2 to 12 gal/ac as part of a spring herbicide treatment. You can also apply it as a foliar spray, through drip tape, or with transplants.

✓ **If you normally apply liquid starter and side-dress fertility**, these applications are an excellent opportunity to compare your usual products with AgriEnergy's — and to add a biological component to your system.

✓ **Foliar feeding crops** is another opportunity to improve crop health. We encourage petiole testing of growing crops as a guide to maximizing foliar effectiveness.

✓ **Residue** is highly recommended to increase the rate of decomposition and convert plant residue into nutrients for your crops. Residue can be applied in the spring, and it is essential when incorporating cover crops.

3. **Select a representative field or two for comparison trials.** We encourage field tests like those used by Practical Farmers of Iowa, so you have an accurate analysis of changes in soils, crop quality, yields and other factors. Yield monitors and GPS maps are great tools for such tests.

Such on-farm research offers one of the highest-return uses of your time, even during the rush seasons of spring planting and fall harvest.

We're eager to help you get started!

Biologically sound farming, local marketing offer hope

Here's how Fred Kirschenmann, Director of the Leopold Center at Iowa State University, envisions the future for Midwest crop producers 25 to 50 years from now — *if conventional monoculture and chemicals continue to dominate production systems:*

- Fossil fuel costs devour an even greater share of gross income as extraction efficiency falls.
- Environmental degradation of soil and water is even more severe than it is now.
- Yields become inconsistent, from a narrower crop genetic base grown on dying soils under greater climate extremes.
- A generally bankrupt farm economy spends more than 95% of its income on production costs — and survives on taxpayer subsidies.

Already, the addiction to fossil fuels, chemicals and conventional fertility is generating a real net farm income lower than it was in 1929.

"To compensate for that, 62% of Iowa farms send someone to work off the farm," notes Kirschenmann. Others try to rent or buy more acres per operator, squeezing net profit and intensifying financial risk.

Most economies of scale have already been realized: Direct corn production costs are nearly the same for a 4,000-acre farmer as the one with 400 acres. Meanwhile, each bushel of increased yield with conventional farming typically requires more fertilizer and chemicals.

Thus farmers' primary path to survival — fighting to become the lowest-cost producer — has about run its course with conventional hydrocarbon energy sources.

Meanwhile, economic power across the food and fiber industry has shifted from farmers to marketers and suppliers. That's reflected in shares of total economic activity within each industry sector:

Share of total economic activity		
Sector	1910-90	Today
Marketers	44%	67%
Input suppliers	12%	24%
Farmers	44%	9%

Farmers can enjoy a much better future, Kirschenmann told our winter seminar participants. But it's a future available to farmers who replace much of their dependence on fossil energy with *biological* synergism between soil organisms, crops and livestock.



Fred Kirschenmann

Kirschenmann describes one example: Japanese farmer Takao Furuno was faced with the same kind of challenges we are — high costs for land, fertilizer and chemicals, slow gains on crop yields and low prices for commodities such as rice, his main crop. Furuno studied past rice-raising techniques along with current science,

and over 15 years of trials, developed his six acres into a biologically efficient farm. About 100 local families each pay him an average \$25 per week for deliveries of rice, duck meat, duck eggs, fish, vegetables and figs. The basic system:

After transplanting rice, he releases about 100 ducklings per acre into the rice paddies. The ducklings devour weeds, insects and golden snails — all of which used to be problems requiring chemicals. The ducks provide fertilizer with their droppings, and aerate the water with paddling. This stimulus increases rice health and vigor. Rice yields average twice that of neighboring conventional farmers.

Furuno also raises fish in the paddy as a third crop, and fig trees on the dikes. Both of these crops are possible because the fields no longer have toxic levels of herbicides and pesticides. As rice begins to set heads, he harvests fish and moves the ducks into finishing facilities.

Challenges Kirschenmann: On your farm, what is the U.S. Midwest equivalent of Takao Furuno's high-management, high-marketing and biologically effective system?

At AgriEnergy Resources, we see enrichment of the soil's microbial

diversity as an important element of a biologically-driven production system.

And we're keen on learning more about how cover crops can displace purchased fertilizer, herbicides and pesticides.

Kirschenmann also points out that mycorrhizal fungi play a crucial role in transporting nutrients.

"But in fields where chemicals and monocropping occur, these fungi have been destroyed," he says. "We aren't looking at what God's creation has already given us."

As opposed to survival through mega-farming, an alternative concept is "to produce a variety of products within a limited space to achieve maximum overall productivity," says Kirschenmann. "This consists of allowing all components to influence each other positively in a symbiotic relationship."

Kirschenmann points out that Furuno's loyal customers are crucial to his farm's "value chain."

It's the farmer-marketers who can best provide unique value which consumers want, he says. Example: SYSCO, the food-service giant with \$30 billion in 2004 sales, is re-orienting its marketing to connect environmentally dedicated farmers to consumers. SYSCO studied why today's consumers value types of food. The summary of their data:

Food attributes rated "extremely important" by consumers (Scale of 1 to 100)	
Taste	77
Quality	62
Nutrition	56
Price	46
Supports local farmer	36
Locally grown	29
Environmentally friendly	25
State grown	25
Small local company	23
All natural	20
Local brand	15
Organic	7

Richard J. Schnieders, SYSCO's chairman and CEO, says that one of the firm's high priorities is keeping unique farmers in business to create "a product so good you remember, and want it again. Our clients want to feel good about their food. They want to have a closer connection to the farmer who produces it."

\$5 corn, 200-bu. yields, 20% annual market growth

Those are *actual numbers* describing today's dynamic marketplace for organically grown food and feed.

Lynn Clarkson, president of Clarkson Grain of Cerro Gordo, IL, told participants at our Winter 2005 Seminar that organic No. 2 corn is trading at \$4.50 to \$5.50 per bu.; sometimes buyers are paying \$6.

Organic soybeans are bringing \$14 per bu. — sometimes up to \$20 if the beans have a certain appearance or flavor profile for special markets.

The Chinese are shipping organic soybeans to our U.S. West Coast market for about \$13 per bushel.

"This is a signal the organic feed market wants more," Clarkson told our group. "If demand continues to increase as I think it will, corn prices will likely increase over the next five years while soy prices will likely decrease, with both remaining very profitable for organic farmers."

The market for organically grown feed grains and soybeans has soared since 1999, when USDA established label standards for organic meats.

"One Texas organic grower I know regularly raises 200-bu. corn, 50-bu. soybeans and 80-bu. wheat," says Clarkson. That irrigated farm has access to a convenient source of livestock manure.

More typically, he says, "Farmers who have access only to green manures raise 120-bu. corn on land that would produce 150 bu. with commercial fertilizers."

Clarkson cited an Iowa State University review of 157 replicated yield trials showing that organic production usually achieves 91% to 93% of conventional yields.

"So the world could go organic and nobody would starve," says Clarkson, dispelling a myth perpetu-

ated by "conventional" farmers and their suppliers.

Clarkson Grain contracts with producers in 20 states and markets their crops around the world. Typically, they say their total organic crop production costs are the same or lower than conventional production. Higher labor and management costs

offset lower chemical and fertilizer costs. But in effect the producer is paying *himself* more for those inputs, such as labor for cultivating.

Clarkson says the U.S. now is the world's largest national market for organic foods. Organic sales have averaged 20% annual growth since 1990, with lots of room for future expansion. This year, organic retail food sales will top \$20 billion, which is still only 2% of the American food market. Two-thirds of American food buyers buy some kind of organic foods sometime during the year. Twenty-seven

percent are regulars who are increasing their share of organic purchases.

Major food chains are the biggest outlet for organic food products, so expansion depends mainly on consumer demand rather than a new delivery infrastructure. Here's how various outlets divide up the U.S. organic food by market shares:

Mass-market grocery chain	37%
Natural food independent grocery ..	28%
Natural food grocery chain	19%
Mass merchandisers	4%
Farmer's market	4%
Food buying club	3%
Food service	2%
Export	2%
Other	1%

Organic sales through institutional food services such as schools are slated for "tremendous growth" the next few years, says Clarkson.

"Currently, ten people — the top buyers of the major food chains —

make the final decisions for 80% of the food on store shelves," Clarkson says. Although that sounds ominous, it could also spell opportunity. As consumers increasingly buy tasty, highly nutritious foods including organic and "natural" products, big retailers will respond quickly to meet that demand.

The food industry is closely watching a whole new "natural food" buying phenomenon in America. It's led by chains such as Whole Foods Market, Wild Oats and Trader Joe's. Whole Foods has just opened a massive 80,000-square-foot store in Austin, Texas.

In a Whole Foods store, Clarkson notes that "the food looks great, aisles are wider, it's a great shopping experience. Prices are higher, but customers aren't buying on price. They are buying quality food, produced by environmentally sensitive farmers.

"You demonstrate affluence when you buy a car. Why not demonstrate it when buying your groceries?"

What does it take to cash in on this affluent "quality foods" market, which is often expressed via organic production? Here's what wholesale and retail organic food buyers want from producers, says Clarkson:

1. Consistently reliable and high-quality supply, via *contract* production which sets prices in advance.
2. Timely shipment to reduce inventory carrying costs.
3. Varied sources to reduce risks of weather impacts on production.
4. Market distinction -- a unique reason to say "mine is better."

Clarkson emphasizes that producers need to make contracts so the producer and the eventual user both operate on a sustainable basis. Contract markets won't overwhelm the system with a surge of price-depressing crops, he says. The food processors and retailers are looking for "long-term, consistent relationships" with producers, he adds.

Farmers need to understand those needs, then provide the needed on-farm storage and consistent crop quality for their own long-term profitability with contract production.



Lynn Clarkson

Demand for highly nourishing food raised by environmentally sound producers is climbing rapidly — an indicator that organic and Renewable Farming systems can earn a growing future.



AgriEnergy Resources

This letter is brought to you by your
AgriEnergy Resources consultant

PRSR.T. STD.
U.S. POSTAGE
PAID
Creative Services

Home office —

21417 1950 E St.,

Princeton, IL 61356

Phone — 815-872-1190

Fax — 815-872-1928

E-mail — info@agrienergy.net

Website — www.agrienergy.net

These biologically active soils warmed up faster!

The aerial photo at right shows how snow has melted off the biologically active fields on the Harward farm near Springville, Utah. The photo was taken in mid-January 2004.

Tillage and soil types are essentially the same on the dark, melted fields and the neighbors' fields, which are still snow-covered. The agronomic difference is that the warmer fields are *more biologically active* following nine years of enhancing soil biological life.

"The photo says it all," observes Jud Harward. Jud and his son Jake raise several cash crops, especially sweet corn for sale at retail stands.

Increased activity of beneficial microbes and fungi in soil also converts crop residue into available nutrients faster, improves soil tilth, raises water holding capacity and raises yield potential.

80% of the soils we test are low on zinc and boron

That's one reason why soil lab manager Gary Campbell encourages a detailed analysis of trace elements in soil tests. "We know we can often get yield increases from very small amounts of needed trace elements," says Gary. We typically recommend chelated trace elements, which are 5 to 10 times as effective per unit as



A light snow has melted off the Harwards' fields, which have warmer soils because of biological activity.

Conventionally farmed neighbors' fields on all sides — with the same tillage and soil types — remain cold and snow-covered longer.

non-chelated products. We also prefer banding zinc and boron in the spring, versus broadcast application.

Why areas of a field high in NPK often have low yields

Bill Naffziger, owner of the farm management firm NBI Services, LLC, told our winter seminar how grid sampling and yield mapping often reveal an anomaly: Soils showing high levels of nutrients with conventional ammonium acetate soil tests often are amongst the lowest-yielding parts of the field.

Yields across a nearly level field vary up to 40%, and the top yields often come from soils that are low in basic nutrients on a conventional test. That's because "High yields

extract more nutrients," says Bill.

So... what makes those nutrients more *available to the crop* in high-yielding soils? Physical differences like drainage, soil structure and density layers play a major role — and those factors have an impact on biological vitality of the soil. A two-acre patch high in NPK may remain waterlogged and biologically sluggish for weeks during critical parts of the growing season. Pattern tiling often has a major positive influence on yields by changing soil physics.

But even on well-drained fields, you can improve the soil's physical and chemical characteristics by enhancing its biological activity with some AgriEnergy Resources products like SP-1 and Residue.