Relay Intercrop Mustard and Soy Bean

John Yockey reviews Pacific Gold Mustard and Soy Bean.

Mustard ready for harvest.

Exactrix owner, John Yockey of Aurora, Nebraska is a pioneer in Relay Intercrop. You can learn more about John Yockey at www.exactrix.com/yockey.htm.

Dark Northern Spring Wheat....high protein, high quality wheat with a much better market price than HRWW.

In year 2004, pictures included, John raised DNSW (Dark Northern Spring Wheat) in a double-crop relay with Roundup Ready (RR) soybeans. The DNSW was seeded into 2003 corn residue in March of 2004. The DNSW yields were in the 100 plus bushel range using rod row samples to estimate yield. However, Fusarium Head Blight (FHB) in the DNSW greatly reduced the final yield and quality. The DNSW variety was Express. Yields dropped to 60 to 70 bushel range at harvest due to FHB or head scab and the final cleanout to remove the infested kernels further reduced the overall yield. The soybean yields were more than acceptable in the double crop relay with DNSW. The soybeans were planted into the DNSW Express about May 15 to 25 of 2004. Corn is the host to FHB. During 2005 the DNSW was not a good crop due to field flooding.

Mustard reviewed in the relay Intercrop technique.

John also raised 40 acres of fumigant mustard, Pacific Gold, an Oriental mustard variety from Genesee Idaho, in a double crop relay with RR soybeans. The remaining 40 acres of the 80 acre ridge till center pivot was in RR soybeans with no intercrop technique.

As a quick review..... fumigant mustard is primarily grown for export and shipped to the Pacific Rim markets. The Pacific Gold mustard was bred specifically at the University of Idaho for the Oriental market to be exported as a high quality seed. Oriental cooking requires mustard oil to produce the definitive hot and tasty “twang” of prepared food dishes.

The U of I variety is very high in glucocyanlate. The chemistry forms Thiocyanlate in soil which acts as a soil fumigant. In fact the soil chemistry and reaction is very similar to Methyl Bromide, a well known commercial soil fumigant that is being phased out because of the ozone layer problem. Oil of Mustard is registered with the EPA as an insecticide, fungicide, nematicide and may also function as a herbicide.

Soy Bean challenged by mustard

Soy Bean challenged by Spring wheat.

John had two primary goals in the relay intercrop technique using mustard. Profit potential was great.

Goal 1 was to raise a high quality seed crop for export using center pivots to boost yields and allow the RR soybeans to be seeded in the relay. High quality Oriental Mustard seed can reach lofty prices...20 cents to 35 cents per pound in the past. The market is very thin since it has primarily export potential and there are not a lot of acres or producers.

Goal 2 was to increase the following 2005 corn yields with the fumigation aspect of Pacific Gold Oriental Mustard.

Goal 1 was not achieved. The mustard yields were in the range of 2,300 pound per acre. Highest irrigated yields are in the 3,000 per acre range on narrow rows in Alberta. The quality of the mustard seed was poor due to the high humidity at pod fill. So the export market was ruled out when John submitted the seed for a quality review at Genesee, Idaho. However, Mustard is an excellent bio-fuel when properly crushed and processed. In fact mustard is considered a superior Bio-Diesel...primarily due to the excellent lubricity and the combustion quality produces very low emissions as compared to soybean based, Bio-Diesel.

You may not know this....Yellowstone National Park diesel vehicles run on U of I processed mustard oil.

Goal 1 may actually be exceeded over time. Allowing for some fine tuning John is planning on crushing the oil and saving the meal. The oil may be more valuable as a fumigant than as a bio-diesel. The meal is where the real money is at. The meal can be used as an organic based soil fumigant for gardens...In fact slugs can be controlled with mustard meal from the Ida Gold insecticide variety. So you may be able to buy fumigant mustard meal for your garden in Nebraska....all John needs is a small bagging line set up.....a few marketing skills....and gardeners can begin to see real results with organic fumigant mustard in their gardens, bluegrass lawns, trees and shrubs. The Pacific Gold meal has high fumigant qualities... meeting the needs of gardeners as a safe organic tool to improve gardens and lawns. The fumigant meal should retail for about $5.00 to $10.00 per pound in small 5 pound bags. 20 and 50 pound bags at $2.00 per pound.

John has 95,000 pounds of Pacific Gold stored in old crib elevator...insects are not a problem....so the seed will keep. If you want to clean up a grain bin... filled it with mustard. There will no insects and mustard will fumigate the bin.

John may be able to break into a new emerging market for the oil and for the meal. Forty acres of mustard might bring another $150,000 of gross income....given a little time. It could be a great sideline project for his two sons, Tom and Dan. John is a pretty smart producer with great people skills. Still water runs deep.....and John may have a venture that would match his busy crop production schedule.

Goal 2 was achieved. The final report is now in on the 2005 commercial corn crop following fumigant mustard, Pacific Gold in the RR soybean relay. The fumigant mustard worked as preached by the University of Idaho breeder, Jack Brown. In large 40 acre test plots laid out with Auto Farm Guidance John discovered that the corn yields were 10 bushels higher as he compared to his standard soybean rotation, corn. He cut the two, 40 acre fields as one and every time the combine crossed into the mustard ground the yields jumped 10 bushels per acre. This is not a real scientific study but enough to convince John that something is going on with fumigant Pacific Gold mustard in the rotation. Also yields were the highest yet achieved on this pivot.

This is a major breakthrough for corn producers in the very short, yield robbing rotation, of soybeans and corn. The short rotation is limiting yields and the Relay Intercrop technique using fumigant Pacific Gold Mustard may have long term benefits that may not be fully understood for another five years.

What are the management issues using Pacific Gold mustard in the Relay Intercrop Technique?

1. The seeding tool and seed delivery must be precise....the modified Deere 1590 or 750 drill was used with great success. Do not consider air cart seed delivery since the metering is not as good with the high cost seed. Gravity drop or individual air port metering is best. Fluted feeds, Valmar or Gandy seed delivery is great. Make sure you No-till seed the crop as early as possible.

2. You need a dual placement, No-till Exactrix Tool Bar to properly fertilize the crop...mustard needs lots of sulfur and has nutrient needs not seen in typical corn production techniques. TAPPS is great fertilizer package for mustard using single disc openers on 15 inch band centers....Go to www.exactrix.com/yockey.htm.

3. The weed control is trick....especially at Grand Island.

4. Do not try to raise the seed for export....producing high seed quality is way too risky as compared to drier climates.

5. Soybeans in the relay need more light since the mustard is very competitive and will hurt the soybean yields. Certain soybean varieties may perform better.

6. Mustard must be harvested earlier in the Relay.....there is no Roundup Harvest label for mustard if you plan to export the seed or meet food grade quality standards. Mustard is not a determinant crop like wheat. The harvest label is used in the relay if wheat is selected for the relay. But there is an answer to this problem.

The management issues are solvable.

1. The drills are available and can be modified to do Relay Intercrop.

2. The nutrient application tool bars are available from Exactrix.

3. The weed control and the maturity can be controlled with Roundup late in the mustard propagation season.

4. Do not raise the mustard as a food grade crop....raise it for the oil as bio-diesel...raise it for the meal..... and raise mustard to improve the following corn yields.

5. Arrange the row spacing more open to allow more light into the soybeans. Mustard might be best seeded with a 24 inch area open for the soybeans and allowing two, six inch spaced mustard rows...the spacing would be 24 inches wide for the bean planting area with a six inch area reserved for two mustard rows....24/6 on 30 inch ridge till rows.

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6. Since food grade mustard is ruled out, producers can use Roundup to ripen the crop early and control weeds. Since this is an industrial crop producers need not be concerned about food grade issues...but make sure it is always segregated which is probably not a problem at Aurora/Grand Island, NE. Also the soybeans will see light sooner if the mustard is killed in late June or early July. If the weather turns to the wet side the Roundup must be applied.

What are the possibilities of Relay Intercrop?

Dr. Jim Schepers USDA-ARS, Lincoln says that the corn is the problem.....the best economics if you want to raise RI wheat is the wheat soybean combination and drop corn entirely....plus most states have a Folicur label for wheat and above all soybeans may need a fungicide early for rust. So you can get a double punch out of Folicur if you time it right. Nebraska is the only wheat producing state that does not have a Folicur label.

The best economics for producers that want to raise wheat in the rotation requires that corn be dropped for now. FHB is not good news with no major breakthrough coming to control FHB head scab.

Producers should be able to raise 100 plus bushel winter wheat and DNSW followed by 50 to 60 bushel beans....this is the best choice for now....and a lower level of risk.

Producers can certainly try other crops in the Relay....RR alfalfa may have a great start in mustard, HRWW or even DNSW. Maybe millet should follow mustard and just double crop. Some smart producer is going to figure this out.....a potential gross return of $700 to $800 per acre can not be denied.

King Corn, move over....there are better choices.

Corn producers take note..... of the potato producers in Washington, Idaho and Oregon....fumigant mustard has shortened the potato rotation from 4 years to 2 years using mustard as a cover crop following soft white winter wheat and hard red spring wheat....fumigant mustard controls nematodes.....this may be a critical factor with soybean cyst nematode. Use mustard as tool to raise better crops and better net returns...it has potential.

Fumigant Mustard will provide many years of value to improve nematode infested soils that will not respond to other management choices in the corn soybean rotation.

You can study fumigant mustard at the University of Idaho and Washington State University dedicated htm's by using your favorite search engine.

Mustard Seed source, Genesee Union Warehouse, Genesee, Idaho, Kyle Renton.
DNSW seed source, Express variety, WPB, Bozeman, Cenex Seed Plant, Moses Lake Washington, Grant Torrey
Mustard Breeder Experts, Jack Brown, University of Idaho.
Oil and Crushing Experts, University of Idaho, Ag Engineering Lab, Charlie Peterson and Washington State University coordinator Dennis Roe.
Marketing and cleaning of mustard seed, DNSW and HRWW, General Grain, Dennis Haugen, Hannaford, ND.
Leading Researcher in RI, Dr. Jim Schepers, USDA-ARS, Lincoln.
Baron of Great Plains Hot Mustard, John Yockey, Aurora, Nebraska
Student of Mustard and General Information Source, Guy Swanson, Spokane.