



MEDINA AGRICULTURE PRODUCTS CO., INC.

FARMING PRODUCT GUIDE

Farming

Biological activity is the life of the soil. Microorganisms are like an army of workers in the soil, feeding the plant, protecting it from disease and maintaining the health and structure of the soil. The ability of soil to support and sustain plant life is in direct proportion to the abundance and vigor of microorganisms.

Over 150 years ago, Justus Von Liebig, known as the architect of chemical fertilizers, discovered that plant productivity increased when chemical compounds of nitrogen, phosphate and potassium were added to the soil. The original intent of chemical fertilizers was only to supplement the soil's basic organic matter.

Since the advent of high-output farming in the 1950s, the importance of organic matter and soil health has been overlooked by many agriculturists. As a result, millions of acres of farm land are dangerously low in organic matter and microbial activity. Farmers are discovering that no matter how much chemical fertilizer is applied, the soil is not capable of increased production. The reason is simple: the biological life in the soil has become exhausted by intense production, over-application of chemicals and by compaction.

Medina products address the need for increased biological activity. In replicated tests conducted by A&L Agricultural Labs, Omaha, Nebraska, Medina increased biological activity by over 2000% in just two weeks.

Microbial "food makers" must digest the nutrients available from chemical or organic sources, to convert them into usable energy for the plant, before the plant can absorb and utilize the nutrients. The late Arthur Franke, co-founder of the Medina Company, told farmers, "the microbes eat at the first table; the plants eat at the second."

There is an essential cycle that needs to be completed for optimal growing conditions. Nitrogen that is organic or tied to carbon is unavailable to the plant. Microbes are needed to break down the Nitrogen into Nitrate which is available to plants. Naturally, without help from products, microbial activity is greatest when the soil is warm, mostly only in later spring and summer. This can cause problems because the soil gets warmer after corn has already had its growing peak making it not as useful to the crop. Increasing the microbial activity as Medina products do, help to supply useful Nitrate to the plant when it is needed most by the plant. Enhanced microbial activity and greater balance of microbes and fungi will accelerate available Nitrogen for growing crops. After the plant takes in the Nitrate it changes it into usable energy for humans and animals. Animals then in turn make it into a form of Nitrogen that is useful to the microbes again. Most of the time the energy is taken from the plant and given to the animal and the byproducts do not make it back to supply the microbes and the plant. That is why the manure and compost in Medina's pasteurized poultry manure needs to be returned to the plant instead of being stored elsewhere to leach into lakes or oceans. When the cycle is completed all waste is turned into usable energy for another type of plant, animal, or microbe.

Medina products are compatible with nearly every crop management practice. It entails the use of biological stimulators, like Medina Soil Activator to strengthen existing soil microbes while causing them to become more efficient and productive. Medina Soil Activator is like a health food drink for microbes. It supplies them with energy to perform their immense tasks. Medina is not an enzyme. It is not a bacterium, not a living organism. It is a highly-developed biochemical respiratory process. These processes make for the most efficient organic transformation.

Medina products increase the performance and the quantity of microbes that convert nutrients into food for the plant. It loosens and mellows compacted soils. And it allows more water and oxygen to penetrate the soil. Microbes are "nature's soil managers". Without an adequate level of microbes in the soil, disease and weeds can overtake otherwise healthy fields. Compaction and erosion will occur. Eventually the soil will lose its ability to support useful plant life, no matter how much fertilizer or organic matter is applied.

Microbes can be classified into three main groups: Producers that will take compounds and gases and increase the energy or nutrient content, Consumers that take more energy out and lower the nutrient content and Degraders that are able to degrade chemical compounds. A healthy soil has a balance of many types of microbes and fungi that all work together. Some build up the organic matter or nutrients that are stored for future crop production, others are breaking down plant residue and old roots and others are degrading chemical residue from fertilizers and herbicides. The Medina biological programs for crop production are designed to promote this diverse microbial population.

As microorganisms digest plant residues, they secrete polysaccharides. These compounds have the unique ability to both bind and release soil particles in order to maintain the proper soil structure. Polysaccharides help make soil more stable, better "balance" - preventing soil particles from compacting and helping to reduce soil erosion.

Today's high-production farming practices can rapidly deplete the soil of essential biological activity. A most noticeable result is soil compaction, a problem common to most farmers. When the soil is compacted, water, oxygen and nutrient intake into the soil is reduced. The soil "freezes-up" and normal plant production is greatly inhibited.

Solving a compaction problem does not necessarily include fewer chemicals, fewer trips over the field or less frequent growing cycles. While those techniques may be helpful, they're not always practical or economical. A major factor in building and revitalizing the soil is the increase in the population and activity of microbes.

Medina products will help reduce compaction, make nutrients more available to the soil, balance pH, increase water retention and help ward off weeds and plant diseases. Medina is not a substitute for good management practices (and it certainly can't control the weather!), but it will result in a healthier soil for growing more productive plants. For best results we suggest using a "Total Program" that combines soil stimulation, seed treatments, and foliar sprays. Some of these programs for specific crops are included.

Products for Farming

Medina Soil Activator

The original biological activator for the soil was derived from a complex bio-catalyst process which increases microbial activity helping with compaction, soluble salts, alkaline, herbicide distress, as well as water stress problems. It is fortified with essential micronutrients and stimulates, strengthens and multiplies the soils indigenous microbes and bacteria. This in turn:

- Converts nutrients into usable food for the plant
- Breaks down crop residue
- Balances the soil micro flora
- Balances soil pH
- Balances soil structure
- Reduces salt accumulations
- Reduces chemical buildups
- Promotes root growth



APPLICATION RATES

FOLIAR APPLICATION

Use 1 gallon Medina Soil Activator per acre mixed with enough water to get even coverage with your sprayer (10 - 20 gallons of water).

CROP RESIDUE MANAGEMENT

After harvest, apply one gallon of Medina Soil Activator on the crop residue before discing. If deep plowing or mold boarding is planned, apply the Medina after plowing.

SEED BED PREPARATION

Application made before planting will improve soil structure and reduce crusting. Use 1 quart per acre if Medina Soil Activator was used for crop residue. Use 1 gallon per acre if this is the first application.

SODIUM/ALKALI SOILS

On soils that are high in sodium, apply 1 gallon of Medina Soil Activator per acre at least 3 weeks before planting. For soils that are very high in sodium, apply 1 gallon of Medina per acre, wait 3 weeks and plant the area with barley or other salt tolerant plants. When growth of 10 -15 inches has occurred disc in the crop and apply a second gallon of Medina before planting the crop to be harvested.

Note: 1 gallon of Medina Soil Activator per acre per year is sufficient for maintenance.

HERBICIDE RESIDUE BREAKDOWN

On soils that have had corn herbicides like Atrazine[®] (applied at recommended rates) and a susceptible crop is planned for next season, apply 1 gallon of Medina Soil Activator per acre after harvest as indicated above for crop residue. If a fall application after harvest cannot be made, apply the Soil Activator as early as possible in the spring and wait at least 3 weeks before planting the susceptible crop. For gumbo soils a second discing, 2 weeks after the application of Soil Activator to get more oxygen into the soil.

Medina Plus

Medina Plus is a combination of Medina Soil Activator plus Soluble Seaweed extracts which contain extra nutrients, trace elements, and amino acids in a natural form. It is ideal for foliar application to fruit trees, vegetables and grain crops. It provides all the benefits of Medina Soil Activator plus:

- Promotes fruit set
- Increases blooming and leaf growth
- Recommended for transplanting
- Recommended for seed treatment



APPLICATION RATES

MIXING INSTRUCTIONS

Always Dilute and Apply With Water. Mix 1 part Medina Plus with 15 parts water.

BROADCAST APPLICATIONS

To stimulate soil microbes and increase quality of production apply 1 gallon per acre if Medina Soil Activator has not been used. If Medina Soil Activator was used apply ½ gallon per acre.

FOLIAR APPLICATION

To stimulate plant growth and promote fruiting and blooming cycle apply 1 to 2 quarts just ahead of blooming.

ALFALFA & HAY

Apply ½ gallon Medina Plus per acre when spring growth starts. Apply 1 quart per acre after each cutting.

APPLES & STONE FRUIT

Apply ½ gallon Medina Plus per acre after bloom. Repeat every 2 to 3 weeks until harvest.

TOMATOES & VEGETABLES

Apply ½ gallon Medina Plus per acre at first bloom. Repeat every 1 - 2 weeks for 2 to 3 more sprayings. On crops that are transplanted, use 1oz. per gallon of water as a transplanting solution.

WHEAT & SMALL GRAINS

Apply ½ gallon Medina Plus per acre before spring growth starts.

ROW CROPS

Apply foliar application of 1 quart per acre early in the growing season, before bloom or head formation.

HuMate Humic Acid

HuMate liquid humic acids are a very concentrated form of humic acids (Liquid Organic Matter) which are essential for healthy crop growth. Using HuMate with fertilizers mobilizes phosphate and metal ions and allows plants to use these nutrients more completely.

Tests with HuMate have shown increased root growth and formation: deepened color in leaves, fruits, flowers and increased branching and compactness. These improvements in overall quality are a result of the increase in plant respiration due to the high quality humic, fulvic and ulmic acids contained in HuMate.

Humic acids, which are colloids, also help prevent minerals from leaching out of the soil and make them more available to root systems.

Humic Acids can buffer plants against excessively high concentrations of fertilizers by absorbing them yet they make the nutrients available when plants need them.

HuMate liquid humic acids have corrected deficiencies in a wide variety of row crops, vegetables and ornamental plants in soils ranging from poor to high organic matter and low to high pH levels.

HuMate is effective under dry or irrigated farming conditions. Benefits include:

- Improves soil physical properties
- Holds exchangeable plant nutrients
- Improves moisture retention
- Enhances nitrogen and nutrient release
- Increased root growth
- Increased release and availability of phosphorus in soil
- Increase in uptake of plant nutrients by increasing membrane permeability



APPLICATION RATES

IRRIGATION SYSTEM: HuMate can be applied with irrigation water. Add 1 to 2 quarts of 12% HuMate per acre with gravity or sprinkler systems. For drip irrigation use 1 quart of 4% HuMate solution, added with fertilizer per application.

LIQUID FERTILIZERS: HuMate can be added to liquid fertilizers at a rate of 1 to 2 quarts of 4% solution per acre. If using foliar or a low volume fertilizer, add 1 quart of 4% HuMate solution to each 2 to 4 gallons of fertilizer.

DRY FERTILIZERS: Spray 1 quart of 12% HuMate on every 200-400 lbs. of dry fertilizer.

MIXING INSTRUCTIONS:

To make a 4% solution, mix 1 part HuMate with 2 parts water. HuMate is designed for mixing with low pH solutions. Test in a jar for compatibility.

Horticulture Molasses

Molasses provides a natural food source for the indigenous microbial populations in the soil. The sugars in molasses can increase microbial activity which will help decay thatch and crop residue thereby increasing the recycling of nutrients. It is recommended for all types of plants, crops and turf. Molasses is compatible with most natural biological soil stimulators.

APPLICATION RATES

GENERAL: Shake well and mix 1 ounce (2 tablespoons) per gallon of water to use as a soil stimulator.

TURF: Use 3 to 12 ounces per 1000 sq. feet. This application can be repeated every 2 weeks as needed.

AGRICULTURE: Use up to 2 gallons per acre.



Beneficial Microbes in a dry soluble form

Medina Beneficial Microbes is a concentrated blend of naturally occurring microbial cultures adapted to assist in soil improvement, nutrient release and organic decomposition and nutrient recycling. For best results the application should be made to a soil that is moist and aerated. Apply before an irrigation event or rain. If it's not possible to irrigate, disc into the soil. Application can be made after harvest to break down residue and prepare the soil for your next crop, or any time before or just after planting to aid in nutrient availability to growing crops.

- Blend of naturally occurring organisms in high concentrations that work together
- Used in conjunction with a normal agriculture program
- Increases the efficiency of added fertilizers
- Helps release plant nutrients tied up in the soil minerals and plant residue
- Aids in nutrient intake into plant roots
- Long stable shelf life (12 months)
- Saves Money

APPLICATION RATES

APPLICATION RATE:

1 Kg jar will treat 100 acres. Mix with enough water to get even coverage – more water is better to help apply the cultures into the soil. This application can be made with Medina Soil Activator and Molasses mixtures. Diluted product needs to be applied within 8 hours of mixing. Do not apply with high salt content fertilizers.



HastaGro Plant

6-12-6

Three products in one: Contains high-quality N-P-K plant food plus Medina Soil Activator to stimulate biological activity, and HuMate humic acid to improve the soil structure by improving nutrient uptake, and seaweed extracts for better root growth and production. It is ideal for foliar applications where nutrients are absorbed directly by the plant. Low-salt, low chemical formulation prevents leaf burn. Nitrogen is derived from clean urea sources. HastaGro is recommended for pastures, fruit trees, vegetables, hay crops, small grains and cotton.

- Gentle formulation for foliar application
- Prevents salt and chemical buildup
- Builds biological activity in the soil
- Promotes fruiting and blooming
- Compatible with drip irrigation
- Compatible with hydroponics

APPLICATION RATES

STARTER FERTILIZER

Apply 1 to 2 quarts HastaGro per acre in the row. May be mixed with water to achieve even application.

COTTON

Use seed treatment (above) and/or starter treatment. At 5 to 6 leaf stage, apply 1 quart of HastaGro 6-12-6 per acre. Repeat to pin head square or until desired fruit is set.

CORN & MILO

Apply 1 quart of HastaGro 6-12-6 per acre at the 3 to 5 leaf stage. At flag leaf stage or one week earlier, apply 1 quart HastaGro 6-12-6 per acre.

WHEAT

With top-dress nitrogen, apply 1 quart of HastaGo 6-12-6 per acre. Repeat at flag leaf stage.

SOYBEANS

At the 3 to 7 trifoliate leaf stage, apply 1 quart of HastaGro 6-12-6 per acre. Repeat in 7 to 10 days.

VEGETABLES

(Tomatoes, beans, peas, cucumbers, melons) At the 2 to 4 leaf stage apply 1 quart of HastaGro 6-12-6 per acre. If more crop set is desired, repeat every 7 to 10 days, up to 4 times.



Growin Green 3-2-3 Organic Fertilizer

Medina Growin Green is an Organic OMRI listed fertilizer for all your growing needs. It is derived from Pasteurized Poultry Manure. Growin Green is pasturized for stability and odor reduction and is slowly released from natural sources for continuous feeding and continuous growth through all the seasons. Growin Green will feed your plants for a 3 to 4 month period and also support microbial life in the soil. When applied to the soil it needs to be watered in to start working, then it will start to quickly feed the plants for noticeable results that will last several months. Growin Green also contains calcium which helps improve the cell structure of plants. It also helps breakdown thatch biologically. It produces three stages of activity including balanced nutrient supply, structure repair through soil supplementation and nutrient availability. Good for hay production, pecan crops, vegetables and adding to potting mix. Available in 40 lb bags and 2,000 lb tote sacks.

- Slow steady release of nutrients
- Neutral pH
- Trace minerals
- Low salt index
- Contains low amounts of silicate

APPLICATION RATES

STARTER FERTILIZER

2 tablespoons per gallon of potting mix.

VEGETABLES

Apply 300 lbs per 1,000 sq ft and may be applied every other month for maintenance.

COASTAL HAY

Suggested rate of 200-500 lbs per acre.

ORGANIC PECAN PRODUCTION

600 lbs. per acre in late February and May for mature trees.

Grape Vineyards

500 lbs. per acre when preparing soil for planting

300 lbs. per acre in late February and May for mature vines.



Biological Soil Programs

Improving Soil Structure and Managing Crop Residue

Increasing the soil life, microbial diversity and activity is the best method to improve the soil structure. It is the microbial activity in the soil that gives the soil texture and keeps the soil from becoming compacted. If you soils are compacted, a biological program is also the best method to improve the soil. A biological program is also beneficial in managing crop residue so it can be converted into organic matter and utilized for future crops. When large amounts of crop residue are left after harvest we suggest a method of quickly converting them to humus in the top laver of soil where more oxygen and the breakdown is done with an aerobic process. This breakdown will increase the energy in the residue. If the residue is plowed to deep into the soil (greater than 8 inches) there is less oxygen and the breakdown is slower or will taking place without oxygen (anaerobic) and energy is taken out of the plant material. One other method that is often used is the no till method of residue management where the plant residue is all left on the soil surface. This does hold moisture and reduce erosion, but much of the energy from the residue can volatize and be lost to the atmosphere. The bottom layer of the residue that is in contact with soil and moisture will be converted to humus. A biological program will also improve the conversion of nutrients in a no till system.

The bio-tillage method of residue management involves additions of nutrients, minerals and energy to the soil after harvest and incorporating the residue by disking into the surface of the soil. If large amounts of residue are worked into the soil the microbes will be using all the available nitrogen from the soil as the residues are digested. If the residue is not digested before the next growing season the nest crop will suffer from lack of nitrogen and nutrients. The addition of 10 to 20 unites of N per acre will supplement the need for nitrogen.

APPLICATION RATES

After harvest apply ½ to 1 gallon of Medina Soil Activator, 1 to 2 gallons of molasses for energy and 10 to 20 units of Nitrogen to the residue before disking. If your soil is low in organic matter the addition of 50 to 100 lbs of Humic Acid Ore should be added also.

Remediation of Salt and Hydrocarbon Contaminated Soil

Medina Soil Activator has been used on arid soils that are high in sodium salts for almost 40 years with good success. In fact, it was the results on rice land that had been flooded with ocean salt water that helped to generate sales for the newly established company in 1962. When Hurricane Carla came on the Texas Gulf Coast it brought salt water on many of the rice fields. Salt content was so high that the rice would not germinate. After one application of Medina Soil Activator used at the rate of 1 gallon per acre several months before planting the new rice was growing in the salty soils again.

Salt accumulation in soil is a growing problem in arid lands and areas that are irrigated. There have been many locations farmed and irrigated with water that contains low amounts of salts and after several years farming is abandoned due to a nonproductive level of yield. There are also areas where crops continue to be grown, but the production is dramatically reduced. These types of farmland have been successfully treated with Medina Soil Activator, and crops can be grown again with increased production.

Medina Soil Activator has also been used on soils that are affected by salt spills in oil field areas. Following treatment, the soil is productive and erosion is reduced because natural vegetation is established again. The application rates for salt water spills of from oil production are treated with higher rates and the application needs to be repeated several times for optimum results. Many times these spills are in areas where minimal rainfall occurs and moisture is required for the microbial processes to work.

The requirements and environment needed to treat high salts in soil are as follows:

1. **Moisture.** The moisture in the soil should be high enough to germinate seeds. Many times salt accumulated soil will have high moisture, because the soils have poor drainage and the salts help hold moisture. If the treatment is done in areas that have limited moisture the applications should be made before and during the seasons when rainfall is normal and expected. Without moisture the treatment will not work.
2. **Oxygen.** The biological life in the soil needs oxygen to grow and survive. If the soil is compacted it should be chisel plowed and broken up to allow the oxygen to enter the soil.
3. **Organic matter.** Most farmland will have enough organic matter that will be used as extra food for the microbes as they grow. If the soil is low in organic matter, and has less than half of 1%, hay or straw should be added along with HuMate Humic Acid. If time permits, good results have been accomplished by allowing the soil to grow a crop of any green mulch that can be plowed under after it has grown. Sudan grass or hay works well in the spring, and oats or wheat in the fall. The type of plants used will depend on your area and the season you are starting your treatment.
4. **Time.** The reduction of salts is not an immediate process. We are stimulating a natural microbial process that takes time. The higher the salt level, the longer the time required. In most minor cases when the salts are just limiting the production, an application can be made about 2 weeks before planting and visible results are seen on the first crop. In areas where salts inhibit germination it may take one year and two applications.
5. **Drainage.** It is also important to have a soil that has good drainage and is not fed by a reoccurring supply of salt water that is forced up from a large ground water table. When the salt water continues to be brought to the surface the applications will have to be repeated to take care of the new supply of salts.

Where does the salt go and what is taking place when Medina Soil Activator is used? The answers to this question are not completely understood. We know that we are able to get seeds to germinate in soils that still have lab results that show toxic levels of salts, and after several months the lab test show lower levels.

Medina Soil Activator is stimulating the soil microbes and during this process the soil becomes more open and loose. The microbes that we are working with also are able to take the sodium into their bodies and this reduces the amount of salts that are in the soil solution. If you run a lab test on this soil you will still find the sodium, but it is in the microbes. That is the action that allows the seeds to germinate in soil that will still test high in sodium. Other noticeable factors taking place are: when the microbes die the sodium is held in an organic compound and still does not hurt plant growth. This organic complex is also more mobile and seems to take the salts deeper into the soil profile where it does not hurt plant growth. We do notice that after about 6 months the lab tests start showing less sodium in the soil. There is also a theory of biological transmutation where microbes are able to make one element act like other elements. In this theory there is an exchange between sodium and potassium. We have seen the same changes in high sodium soils that are treated and the sodium is reduced and the potassium levels increase.

APPLICATION RATES

Apply 1 gallon of Medina Soil Activator to each acre of soil.

Establishment of Grass in Arid Poor Soils

Changing bare arid soils into grassland is an ongoing process that cannot be done in one step. The first step is to stimulate the biological life in the soil, because all plant growth will depend on it. The health of the soil must be worked on first. The start of this program will include breaking up compaction if the soil is packed hard so moisture and oxygen will penetrate into the surface. This should start just before the season when you expect to receive rain. You do not want to plow the soil when it is hot, dry and windy. That would cause more harm to the limited amount of organic matter and allow wind erosion. A chisel plow would work well to break the compaction and it will leave the surface organic matter on the surface of the soil. If there is also a large amount of plant residue on the surface, a light disc would help prepare a good seed bed, without moving the organic matter too deep into the soil. We want to leave the organic matter and plant residue on or near the surface where there will be oxygen to decay it. This will also insulate the soil from the heat and wind. Do not mold board or deep plow the organic matter deep into the soil! A gallon of Medina Soil Activator should be added to each acre along with 1 quart of Humic Acid. This can be done before the soil is chiseled or disc. These applications will start to build the soil microbial life and develop a soil that will be ready to support the new grass.

If your soil is not compacted you will not need to chisel or disc the soil. You can make the applications of Medina and Humic Acid and wait for the rains to move it into the surface of the soil. Many times when you start stimulating the biological life of poor soils you will have many weed seeds that have been in the soil for years that will start to grow. This is the natural method of soils to improve themselves. These weeds are the best plants to let grow, because they are adapted to the environment that you have and they will become food and organic matter for the soil microbes. Let them grow! After one year of weeds you can start to remove them and make room for more of the grasses that will become a permanent ground cover.

If the poor arid soil is very low in organic matter and you have a cheap source of residue that can be added to the soil it will help build and insulate the soil. This can be partly decomposed garbage, brush trimmings, manures, municipal sewage sludge or plant residue. This residue does not have to be totally composted or broken down. The addition of 5 to 10 tons of organic residue per acre will help build the soil. These applications should be used along with the applications of Medina Soil Activator and Humic Acid to stimulate the composting actions in the surface of the soil. If you add the organic residue that is light and could blow in the wind it can be mixed in the surface layer of the soil. It should be left in the top four inches of the soil. If you are using sludge or manures that will not blow you can leave them on the surface.

You may have arid soils that have deteriorated to the level that a lot of erosion has taken place and the natural grass plants and seeds have been lost. In this case you will need to replant or reseed the area. You will need to find plants and seeds that are adapted for the conditions that you are working with. The planting needs to be done after the soil health has been addressed and before or after the rains start. Always remember to start with the soil microbial life and the health of the soil first.

APPLICATION RATES

Apply 1 gallon of Medina Soil Activator per acre application each year for at least 3 years and then you could cut the rate if you have established a good stand of healthy grass. For a continual grass land improvement program the addition of Medina Soil Activator each year before the spring rains will continue to improve the soil health.

Remediation of Herbicide and Chemical Residue

Herbicide carryover is a major concern among growers as they begin planning for the next season. This problem can be specifically severe when drought conditions are present. Lack of moisture slows down the natural decomposition of the herbicide and never leaves residue near the soil surface. There are several natural methods that will reduce herbicide residues. These include evaporation, leaching, ultraviolet rays and microbial degradation. Microbial degradation is the fastest and most effective way to break down the residues. However, the microbes need the proper combination of temperature and moisture in order to do their job. When the soil is dry, microbes are relatively inactive and therefore less effective in breaking down herbicides. Cold temperatures will also slow down the natural microbial activity. Herbicide carryover can cause a number of problems for the farmer including irregular rotation, reduced yields and crop damage. Medina has developed a comprehensive program that drastically reduces herbicide carryover while improving the overall structure of the soil. The program involves application of Medina Soil Activator which is capable of breaking down chemical bonds in the soil.

APPLICATION RATES

PREPLANT WITH MEDINA SOIL ACTIVATOR

Apply 1 gallon per acre of Medina Soil Activator 2-3 weeks before planting. Also apply Medina Molasses at the rate of 1 to 2 gallons per acre to supply energy to the soil.

FOLIAR SPRAY WITH MEDINA PLUS

After harvest apply 1 gallon of either Medina Soil Activator or Medina Plus to decompose plant stubble as well as herbicide.

Application note: Apply after final mold boarding. If discing, make sure Medina remains in the top 6" of soil.

Agricultural Total Programs



Cotton

PRE-PLANT APPLICATION OF MEDINA SOIL ACTIVATOR

Apply one gallon of Medina Soil Activator per acre as late as 1 month before planting. It can be tank mixed with pesticides, fertilizers or most herbicides. We suggest incorporating or broadcasting when applying.

If your soil has had problems with Cotton Root Rot, We suggest adding Medina Beneficial Microbes. This has shown to help reduce the size of the affected area and delay the dying.

SEED TREAT AT PLANTING TIME

At planting time, add Medina SeedGro Treatment to the seeds by mixing it in the seed hopper. 4 oz. of SeedGro will treat 50 lbs. of seeds. It can be applied dry by dusting the seeds with the treatment and then lightly mixing. This is a special seed treatment that inoculates the seeds with microbes and coats them with minerals and nutrients in a form that will stimulate germination and seedling vigor. This is important in establishing a crop that will produce maximum yield.

POST-PLANT APPLICATION OF MEDINA PLUS

If Medina Soil Activator could not be applied prior to planting and the cotton is already up, then broadcast ½ gallon per acre of Medina Plus on the young cotton.

SQUARING APPLICATION OF HASTAGRO 6-12-6

Once the cotton is at the fourth or fifth internode, just as squaring is starting, foliar feed 1 oz. of HastaGro 6-12-6 to the acre. HastaGro can be tank mixed with pesticides or herbicides. Repeat this rate every 2 to 3 weeks. Foliar spraying can continue as needed during blooming cycle.

PLANT STRESS APPLICATION OF HASTAGRO 6-12-6

If young cotton is going through stress from wind, water or herbicide damage, broadcast 1 qt. of HastaGro 6-12-6 per acre to help overcome symptoms.

SOIL BORNE DISEASES

To help reduce root rot or other soil borne diseases, use Beneficial Microbes at a rate of 1 Kg to 100 acres of land.

Corn

PRE PLANT APPLICATION OF MEDINA SOIL ACTIVATOR

Apply one gallon of Medina Soil Activator per acre as late as 2 weeks to 1 month before planting. It can be tank mixed with pesticides, fertilizers or most herbicides. We suggest incorporating or broadcasting when applying.

SEED TREAT AT PLANTING TIME

At planting time, add Medina SeedGro 20 to the seeds by mixing it in the seed hopper. 4 oz. of SeedGro will treat 50 lbs. of seeds. It can be applied dry by dusting the seeds with the treatment and then lightly mixing. This is a special seed treatment that inoculates the seeds with microbes and coats them with minerals and nutrients in a form that will stimulate germination and seedling vigor. This is important in establishing a crop that will produce maximum yield.

POST-PLANT APPLICATION OF MEDINA PLUS OR HASTA GRO

Treat with foliar spray of Medina Plus or HastaGro 6-12-6 when growth is 18 inches tall. Apply 1 qt per acre.

FOLIAR APPLICATION OF HASTA GRO 6-12-6

Prior to tassel, apply one quart of HastaGro 6-12-6 to the acre. HastaGro can be tank mixed with pesticides or herbicides.

Soybeans

PRE-PLANT APPLICATION OF MEDINA SOIL ACTIVATOR

Apply one gallon of Medina Soil Activator per acre as late as 2 weeks to 1 month before planting. It can be tank mixed with pesticides, fertilizers or most herbicides. We suggest incorporating or broadcasting when applying.

SEED TREAT AT PLANTING TIME

At planting time, add Medina SeedGro 20 to the seeds by mixing it in the seed hopper. 4 oz. of SeedGro will treat 50 lbs. of seed. It can be applied dry by dusting the seeds with the treatment and then lightly mixing. This is a special seed treatment that inoculates the seeds with microbes and coats them with minerals and nutrients in a form that will stimulate germination and seedling vigor. This is important in establishing a crop that will produce maximum yield. SeedGro can be used with Rhizobium inoculants.

POST-PLANT APPLICATION OF MEDINA PLUS

If Medina Soil Activator could not be applied prior to planting and the beans are already up, then broadcast ½ gallon per acre of Medina Plus on the young plants.

FOLIAR APPLICATION OF HASTA GRO 6-12-6

At first bloom apply one quart of Hasta Gro 6-12-6 to the acre. HastaGro can be tank mixed with pesticides or herbicides. Repeat this rate every 2 to 3 weeks. Foliar spraying can continue as needed during blooming cycle.



Hay



PRE-PLANT WITH SOIL ACTIVATOR

Apply 1 gallon of Medina Soil Activator and 2 gallons of Molasses per acre. This can be applied to the surface before irrigation or rain to wash it down into the surface of the soil. If you are making the applications to fields that will have some light tillage, it is best to make the applications before the tilling. These products need to get into the surface of the soil and have some available moisture before they will start to work

FERTILIZING WITH HUMATE HUMIC ACID

The next steps that work well on hay fields is to add HuMate Humic Acid to the fertilizer you apply. Humic Acid will help keep nutrients more available in the soils and reduce problems with salt build up from fertilizers and irrigation water. If you are using liquid fertilizer, we suggest adding 1 quart of liquid Humic Acids with the fertilizer per acre. Some people have a bulk tank at the pivot and add a small amount of N-32 with each watering. Then we suggest that you add 5gallons of Humic Acid with each 100 gallons of N. If you are using dry we have a dry Humic ore that can be mixed in with the fertilizer. Normal applications of dry Humic are in the range of 200 lbs per acre, but that would last for about 10 years. We suggest starting with about 50 lbs per acre and put it out for several years.

FOLIAR APPLICATION OF HASTA GRO 6-12-6 OR MEDINA PLUS

HastaGro 6-12-6 or Medina Plus can be applied at the rate of 1 quart per acre after each cutting. This helps the hay recover from the stress of harvesting so it will re grow faster.

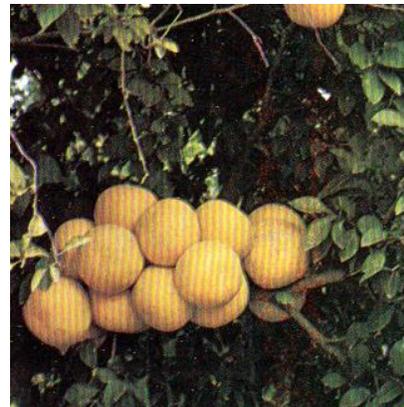
Apples, Pecans & other Fruit & Nut Crops Program

TRANSPLANTING ROOTSTOCK

When high volumes of transplanting water is used to water in new trees (approx. 5/gal per tree), use 1 gal of Medina Plus mixed with 100 gal of water.

When trees are watered in with row or drip irrigation, use a low volume transplanting solution of 1 part Medina Plus mixed with 20 parts of water. Use ½ gal of this solution for each tree before the irrigation water.

To stimulate root growth of new transplants, inject HastaGro 6-12-6 through the drip irrigation water at a rate of 2 oz per gal of water. Run the drip until 1 gal of mixed solution has been watered in for each tree.



PROMOTING GROWTH OF NEW ORCHARDS

Start each spring with a soil application of 1 gal per acre of Medina Plus. Use foliar sprays of 1 oz HastaGro 6-12-6 mixed with 1 gal of water and spray the leaves until they start to drip. Repeat this foliar spray every 2 to 4 weeks through the growing season until 6 weeks before the first frost date.

PROMOTING ROOT SET AND GROWTH ON MATURE TREES

Start each spring with a soil application of 1 gal per acre of Medina Plus before new spring blooms. Foliar sprays should start at 2/3 petal drop and continue through the growing season. The first spray, at 2/3 petal drop, should be made with Medina Plus using 1 qt mixed with 100 gal of spray. Foliar sprays of HastaGro 6-12-6 should continue on a 7 to 14 day intervals using 1 gal mixed with 128 gal of spray (1 oz/gal).

PROMOTING UNIFORM RIPENING OF FRUIT AT HARVEST

Make a foliar spray of Medina Plus using 1 quart to 50 gal of water 3 weeks prior to harvest.

PROMOTING PRECAN PRODUCTION ON MATURE TREES

Start each spring with a soil application of 1 gal per acre of Medina Soil Activator or Medina Plus along with 1 gallon of liquid Molasses. Add liquid Humic Acid with all zinc sprays using at least 1 quart per acre of humic acid. Add HastaGro 6-12-6 at the rate of 1 oz per gallon with all foliar sprays. Growin green 3-2-3 granular organic fertilizer can be applied at the rate of 600 lbs per acre in late February before bud break and repeated in May.

Potatoes

PRE-PLANT WITH SOIL ACTIVATOR

Apply 1 gallon of Medina Soil Activator per acre as late as 1 month before planting. It can be tank mixed with pesticides, fertilizers or most herbicides. We suggest incorporating or broadcasting when applying.

SEED TREAT AT PLANTING TIME

At planting time, add Medina SeedGro to the seeds by mixing it in the seed hopper. 4 oz. of SeedGro will treat 50 lbs. of seeds. It can be applied dry by dusting the seeds with the Treatment and then lightly mixing. This is a special seed treatment that inoculates the seeds with microbes and coats them with minerals and nutrients in a form that will stimulate germination and seedling vigor and reduce disease. This is important in establishing a crop that will produce maximum yield.



ENHANCE STARTER FERTILIZER

Mix 1 quart per acre of Medina HuMate with starter fertilizer that is applied at planting. This complexes the fertilizer and helps keep it more available for the plants.

FOLIAR APPLICATION OF MEDINA PLUS

At 10 days before full bloom or at first bloom apply 1 gallon of Medina Plus on the foliage.

FOLIAR APPLICATION OF HASTAGRO 6-12-6

At first tuber set apply 1 qt. of HastaGro 6-12-6 to the acre. Hasta Gro can be tank mixed with pesticides or herbicides. Repeat this rate in 2 weeks. Foliar spraying can continue as needed up to the last bloom.



PLANT STRESS APPLICATION OF HASTA GRO 6-12-6

If the potato plants have stress from wind, water or herbicide damage, broadcast 1 qt. of HastaGro 6-12-6 per acre to help overcome symptoms.

Wheat

PRE-PLANT APPLICATION OF MEDINA SOIL ACTIVATOR

Apply ½ gallon of Medina Soil Activator per acre before planting. It can be tank mixed with pesticides, fertilizers or most herbicides. We suggest incorporating or broadcasting when applying. Medina Soil Activator will help reduce compaction, allow the roots to go deeper and help break down herbicide residue.

SEED TREAT AT PLANTING TIME

At planting time, add Medina SeedGro to the seeds by mixing it in the seed hopper. 4 oz. of SeedGro will treat 50 lbs. of seeds. It can be applied dry by dusting the seeds with the treatment and then lightly mixing. This is a special seed treatment that inoculates the seeds with microbes and coats them with minerals and nutrients in a form that will stimulate germination and seedling vigor. This is important in establishing a crop that will produce maximum yield.

POST-PLANT APPLICATION OF MEDINA PLUS

If Medina Soil Activator could not be applied prior to planting or if you have used your wheat for grazing we suggest using ½ gallon per acre of Medina Plus in the spring when you top dress the wheat.

FOLIAR APPLICATION OF HASTA GRO 6-12-6

If your wheat is irrigated or if you have good soil moisture foliar feed 1 qt. of HastaGro 6-12-6 to the acre.

Blackberries/ Grapes/ Blueberries

PREPARING SOIL BEFORE PLANTING

Plow deep to break any compaction and till soil; add 500 lbs per acre of Medina Growin Green granular organic fertilizer and spray with Medina Soil Activator and liquid molasses at the rate of 1 gallon per 4000 sq. ft. Repeat tilling. This will increase the microbial action of the soil and help keep the soil mellow.

TRANSPLANTING ROOT STOCK

When high volumes of transplanting water is used to water in new vines (approx. 2/gal per hole), use 1 qt. of HastaGro 6-12-6 and 1 teaspoon of Medina Beneficial Microbes mixed with 100 gal of water.



When the vines are watered in with drip irrigation, use a low volume transplanting solution of 1oz. HastaGro 6-12-6 per gallon of water and use at least ½ gallon of this solution per vine before the first irrigation. This solution is made mixing 1 gallon of HastaGro and 1 tablespoon of Medina Beneficial Microbes per 100 gallons of water.

To stimulate root growth of new transplants, inject HastaGro 6-12-6 through the drip irrigation water at a rate of 1 oz. per gal of water. Run the drip until 1 gal of mixed solution has been watered in for each vine. Repeat monthly during growing season.

PROMOTING PRODUCTION ON MATURE VINES

Start each spring with a broadcast soil application of 1 gal per acre of each Medina Soil Activator and Molasses. Add HuMate with all foliar sprays at a rate of at least 1 qt. per acre and HastaGro 6-12-6 at the rate of 1 oz. per gallon with all foliar sprays. Growin Green 3-2-3 granular organic fertilizer can be applied at the rate of 300 lbs per acre in late February and again repeated May.

PROMOTING UNIFORM RIPENING OF FRUIT AT HARVEST

Make a foliar spray of Medina Plus using 1 quart to 50 gal of water 3 weeks prior to harvest.

Watermelons

PRE-PLANT APPLICATION

Apply a pre emergence application of 1 gallon Medina Soil Activator and 2 gallons of Molasses per acre to the soil.

SEED TREAT AT PLANTING TIME

At planting time, add Medina SeedGro to the seeds by mixing it in the seed hopper. 4 oz. of SeedGro will treat 50 lbs. of seeds. It can be applied dry by dusting the seeds with the Treatment and then lightly mixing. This is a special seed treatment that inoculates the seeds with microbes and coats them with minerals and nutrients in a form that will stimulate germination and seedling vigor. This is important in establishing a crop that will produce maximum yield.

TRANSPLANTING

If transplanting, apply 1 qt. of Medina HastaGro 6-12-6 per acre mixed in with transplanting water at time of planting.

POST-PLANT APPLICATION OF MEDINA PLUS

At time of “first runner” apply a foliar application of Medina Plus at rate of 1 gallon per acre.

FOLIAR APPLICATION OF HASTA GRO 6-12-6

Apply three foliar applications of 1 qt. Medina HastaGro 6-12-6 per acre in intervals of approximately three weeks. Either fungicide or herbicide may be mixed and applied in conjunction with the HastaGro.

SOIL BORNE DISEASES

To help stop vine rot or soil borne diseases, use 1 Kg of Beneficial Microbes to 100 acres of land.



Product Demos

Herman Hartle Corn Demo in Poteet, TX

Demonstration Purpose: To prove that Medina products can help crop yields under the stress of freeze and no irrigation.

Parameters: The field was split into an area treated with Medina products and a check or control area that was not treated.

Treatment: Medina Soil Activator was applied pre-plant at 1 gallon per acre. Medina-SeedGro 20 was used at the rate of 4oz to 50lbs. of seed. Hasta Gro 6-12-6 foliar spray was applied at 1 qt. to the acre.

Agronomic Factors: The spring of 2003 had a late freeze that came after the corn had germinated. This field was also set up as an irrigated plot, but because of well problems it was not able to be irrigated.

Results:

The treated area of the field was able to produce more corn under the added stress of these conditions.



Hand Harvested Plot Data:

	Treated	Check	
Ounces	106 oz.	89 oz.	19 % increase

Machine Harvested Data:

1.1 acres from each area of the field was harvested with a combine.

	Treated	Check	
Pounds	3,050 lbs.	2,450 lbs.	24.5% increase
Aflatoxin	160 PPB	240 PPB	33% decrease

White Chipper Potato Demo in Frio County, TX

Demonstration Purpose: To prove that Medina products increase crop yields.

Parameters: The field was split into an area treated with Medina products and a check or control area that was not treated. One week before harvest on 5-5-03 and 5-6-03, four hand harvested plots 15 foot 4 inches long were dug and weighed. Each replication was chosen with two locations from identical areas in the field. The Medina Potato program was applied to ½ of one 180 acre pivot. Three reps were taken on the last pivot track, one 30 rows into the treated and un-treated areas, one 40 rows and one 50 rows. The field was wet and we could not drive into the areas. The last rep was taken on the 2nd pivot track from the end and the areas were 50 rows into each area.

Treatment: Medina Soil Activator was applied with an airplane in early spring at the rate of 1 gallon per acre. HastaGro 6-12-6 was applied with the pivot irrigation system at the rate of ½ gallon per acre.



Results: Following is the data from the replicated plots.

Medina			
Size	Number of potatoes	Pounds of Potatoes	Bags of Potatoes/ acre
>2"	76	23.24	232.4
>2"	77	24.77	247.7
>2"	61	17.47	174.4
>2"	60	17.15	171.5
Total	274	82.63	826
Average	68.50	20.66	206.50
<2"		39.59	395.9
			98.98
Check			
Size	Number of potatoes	Pounds of Potatoes	Bags of Potatoes/ acre
>2"	63	18.36	183.6
>2"	49	18.59	185.9
>2"	40	11.59	115.7
>2"	46	14.88	148.8
Total	198	63.4	634
Average	49.50	15.85	158.50
<2"		38.69	386.7
			96.68
		Increase in Yield for >2"	48.00
		Increase in Yield for <2"	2.30
Results from hand harvest plot at harvest time			
Medina >2"		333 bags	
Check >2"		168 bags	
		Increase of 165 bags (100#/ bag)	

Yukon Potato Demo in Frio County Texas

Demonstration Purpose: To prove that HastaGro 6-12-6 reduces stress from Freeze, Hail and Wind.

Parameters: The field was split into an area treated with Medina products and a check or control area that was not treated.



Treatment: On March 10th, to help the plants recover from the stress $\frac{1}{2}$ gallon of HastaGro was watered in with the center pivot on $\frac{1}{2}$ of the area. In March, the treated area was again watered in with $\frac{1}{2}$ gallon of HastaGro with the pivot.

Agronomic Factors: February of 2002, when the potatoes were about 3 inches tall a hard freeze hit and froze the plants about 2 inches below the ground. Later small Hail, cool cloudy days and strong wind again put the plants in stress.

Results: The potatoes on the treated side recovered faster with better survival and re-growth. HastaGro treated potatoes had better quality, shape and yield before the potatoes were ready for harvest, 10 foot sections were hand dug. Estimated yield based on 2 replicated hand harvested plots on May 7 was:

Treated Area	Control Area	Increase
208 Bags/ acre	140 Bags/ acre	68 Bags

Frank Rowley Soybean Demo in Kansas

Demonstration purpose: To prove that Medina products can help you not only get higher crop yields, but also better usage out of your equipment when plowing and working the soil.

Parameters: The field was split into a 130 acre plot that was treated with Medina products, and an 18 acre plot that was not treated to make the control plot.

Treatment: The Medina area was treated with Medina SeedGro at rate of 4 oz per 50 lb of seed, Medina Soil Activator, and liquid USDA Rhizobia, while the control area was treated only with USDA Rhizobia.



treated

control

treated

control

Results:

These results are from the 165 horse power M.F. tractor 8250, pulling a 5 Shank Brillion Soil Commander 14" deep.

Control

3.7 MPH
 11.2 Gallons per hour
 12-14% wheel slip
 5.1 acres per hour
 \$4.53 Tractor rental per acre
 1.96 acre labor @ \$10 an hour
 Total cost per acre \$6.49

Medina

5.4 MPH
 9.6 Gallons per hour
 6% wheel slip
 7.9 acres per hour
 \$2.92 Tractor rental per acre
 1.27 acre labor @ \$10 an hour
 Total cost per acre \$4.19

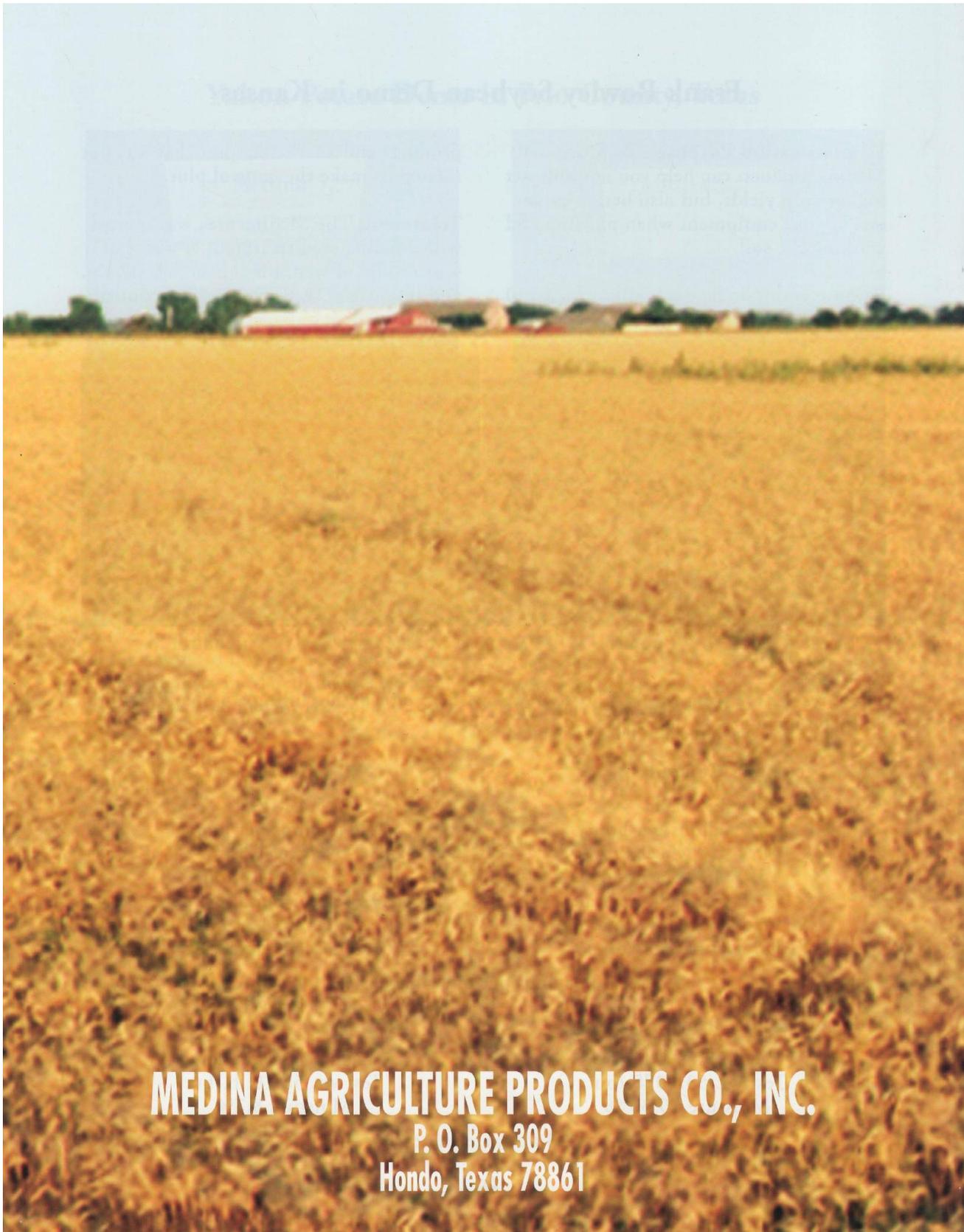
\$2.30 Savings per one tillage event

These are results from crops.

Yield 19.64 Bu/Acre
 Test wt. 53.90 lb/Bu
 Moisture 10.30 %

Yield 37.94 Bu/Acre
 Test wt. 58.10 lb/Bu
 Moisture 8.7%

18.3 Bu/Acre Increase



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