Guano NEWS
November - December 2001

Biostimulant proves a success in on-farm trials

Grower Peter Abel tests the soil compaction in his nicknamed "concrete paddock" with a new agronomic tool called a penetrometer.

FREELANCE agronomist Richard Jackson has improved the soil structure of a sample paddock near Warrigal by almost 100 per cent using the biostimulant Agrispon.

He has been working with potato growers Peter and Yvonne Abel at their property Araluen Downs, Shady Creek, 15 kilometres north-east of Warrigal, Victoria.

Mr Jackson recorded good results during the early Agrispon trials with Agri Sciences in America, and now wants to get the same results in commercial conditions.

Agrispon is new to the Australian market and Mr Jackson said in general, biostimulants were still a new concept to Australian farmers.

They are a natural soil additive that enhances nutrient availability and soil structure without any negative environmental impact.

Grower Mr Abel had an affectionately named "concrete paddock" with extremely poor soil structure.

Using a new tool known as a penetrometer, Mr Jackson measured the soil compaction at 12-15cm, which meant he could penetrate the soil surface to that distance before he hit the "plough pan".

After a pre-application of Agrispon before planting, the soil penetration improved to 25cm in a matter of weeks.

"Seeing is believing," Mr Jackson said.

"Such an improvement in the friability of the soil is remarkable."

Agrispon was applied by boom spray onto the soil surface.

It was an unusually wet time of year for the property.

The resultant soil improvement meant the plant roots could move more easily through the soil, thus allowing quicker access to moisture and nutrients.

"Softer" soil also aided the formation of the potato tubers, Mr Jackson said.

He said knowledge of this sort was imperative to growers moving from conventional to sustainable farming practices.

He said statistics from the Australian Bureau of Statistics in the late 1990s put sustainable agriculture at 8 to 10 per cent of the total agricultural field, but he now believes that figure to be considerably higher.

"The number of people turning towards sustainability is snowballing," Mr Jackson said, "because more and more growers dislike using chemicals and want to work more naturally.

"They are concerned about the environment in a big way, so the more available we can make information about these sorts of products, the more chance they have to make the change." □

Comparing notes on the biostimulant Agrispon are agronomist Richard Jackson (left) and grower Peter Abel, who has almost doubled the friability of his soil.

The "concrete paddock"

IT was always a hard paddock to work with. We gave it the nickname 'concrete paddock' because it tended to strip our cultivation equipment to bits."

So said potato grower Yvonne Abel, of Araluen Downs, a beef /dairy property at Shady Creek near Warrigal, Victoria.

She and husband Peter are among the latest growers to try Agrispon, a biostimulant designed to revitalise the microbial activity of the soil.

John Jashar using a penetrometer

The couple also holds a fertiliser agency and wanted to test the product before putting it on the shelf for sale with a range of other conventional and organic products.

"The 'concrete paddock' is mostly sandy loam, with a clay base," Mrs Abel said.

"It had had two cultivations in the past three years, and would just wear out the blades on our rotary hoe.

"We knew of Agrispon but have always been cautious of new products, so we decided to give it a try.

"This is still our trial period, but the results are looking optimistic.

"We like the idea that it is a plant extract that feeds existing microbes in the soil and helps them to multiply.

"It's encouraging the microbes that are already in the soil, which are probably more suited to the area anyway."

Mrs Abel said the property was cleared 40 years ago and had not had much disturbance to the soil until cultivation in recent years, but the "concrete paddock" had always been a problem. □

Yield doubles with Agrispon

THE results are in for a wheat paddock near Inverell, New South Wales, which was strip sprayed with Agrispon in late May.

The expected crop off the strips not affected by Agrispon was 4-5 bags/acre, while the biostimulant-enhanced crop produced 8-9 bags. It's a great result for systems agronomist Robert Drewitt, of Bingara Farm Centre.

The history of the project began in March, when the existing mung bean crop was harvested by grower Bob Muir, who owns the 4000-acre property Yeral between Bingara and Delungra.

The 80-acre paddock was sprayed with Round Up in May and the wheat variety Sunsoft 98 was direct-drilled into the mung bean stubble. It was undersown with Salado lucerne to begin its readiness for a pasture phase.

The soil profile showed an average soil moisture. Mr Muir applied 65kg of Goldphos 20 fertiliser when the crop was sown.

Agrispon was applied at a rate of 1 litre/hectare with a broad-leaf herbicide at the five-leaf stage, during June.

"It's been a very tough season and neither the Agrispon crop or the other one was a great crop," Mr Drewitt said. "You could say the Agrison stripes produced average wheat heads, while the other stripes were dismal.

"But what we found was that Agrispon works best when the crop is stressed - either by lack of moisture, water-logging or heat."

"I find it works best in less-than-perfect conditions." □

Guano NEWS
November - December 2001

Soil designed to support diversity

NUTRIENTS and texture have always been considered when discussing soil, but people often forget a third aspect as important as the other two - biology.

Soils were programmed billions of years ago, to perform a specific function, says Derek Little, marketing manager for Agricultural Sciences, the company which produces Agrispon.

That function was to support the growth of a multitude of plants.

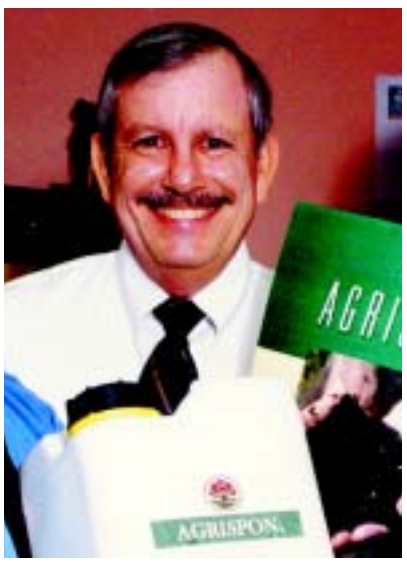
The plant life established and supported animal life that foraged on it.

When man came on the scene, most of his time was spent in gathering food and avoiding being gathered himself.

As man evolved, he discovered tools which reduced the amount of time it took to gather food and reduced the chances of becoming food of another predator.

Man also discovered that plants could be cultivated in a way that increased their availability that could, in turn, free up people to develop other needed functions such as carpentry.

Biodiversity is the name given to the condition where numerous species of plant and animal life exist in a given region, and this relates directly to soil.



Derek Little

Since plants were programmed to grow intermingled with plants of other species, the soil evolved to support this system.

However, the central ingredient of cultivation was to replace biodiversity with monoculture.

This tampered with the programme given to soil - to support biodiversity - and when we deviated from growing multiple species intermingled, we needed to re-balance the system. Crop rotation, fertilisers, and pesticides were developed.

Mr Little said monocultures could be tolerated in the short term, because the system designed to support biodiversity took time to recognize the monoculture and kick in the devices designed to get rid of it.

As plants grow, they take up nutrients and water through the roots and process these in the leaves through photosynthesis where energy supplied through sunlight converts raw materials into a chemical compound that supports life in the plant.

This material, called photosynthate, is different for each species of plant.

Some of this photosynthate is exuded through the root as it grows.

The exudate becomes the primary energy source for groups of bacteria, fungi, and other micro-organisms that have evolved to form a symbiotic association with their host plant.

In return for the material that acts as energy for survival and reproduction, the micro-organisms release enzymes, coenzymes, polysaccharides, siderophores and other materials. These natural chemicals perform a number of functions in the soil.

Some solublize nutrients held in the soil making them available for use by the host plant while others aggregate soil particles, improving the environment for growth. Still others hold check on those organsms that would invade and harm the host plant.

As mentioned above, each plant species manufactures a photosynthate that is unique to itself. This means that the species of micro-organisms that are stimulated by this material are different from species to species.

When biodiversity occurs, many groups of micro-organisms are abundant in the areas of root growth throughout the soil profile. As a group they efficiently keep populations of micro-organisms not dependent on photosynthate in balance.

Despite the problems they incur, pathogens do serve a purpose.

When an annual plant has gone through its life cycle and its energy is going into seed production to ensure procreation, it reduces the photosynthate exuded into the soil. As this occurs, the populations dependent on this material decrease.

This opens pathways for pathogens which then hasten the demise of the plant, starting the composting process that will eventually turn the plant material into reusable nutrients that can be used by the sprout from the seed just produced.

Pathogens also are like a policing force to ensure that no one species becomes dominant.

If one species starts to germinate and grow too many plants in an area, an imbalance in the population diversity and micro-organisms in the soil occurs, which decreases the amount of biochemicals and other devices in the soil that keep the pathogens from invading host plants.

This weakens a certain number of plants of the species until they succumb to the stress, thereby thinning the species and bringing the soil and plant life back into balance.

Pathogens are not the only device used by nature to thin plants that become too prevalent. Certain bacteria found around the root system of plants release natural inhibitors of plant growth.

It is also interesting to note that parasitic nematodes attack the root at the new growth area. This is the area of photosynthate release. The nematodes thereby reduce the ability of the plant to increase the micro-organisms that support its existence.

When one nutrient becomes too abundant or too lacking it could effect the availability of other nutrients.

In a biodiverse system, nutrients are kept in balance naturally. If one species gets too prevalent it starts to take out those mineral nutrients it needs most leaving the ones not needed. Eventually those remaining minerals become too abundant and react to make the nutrients needed by the dominant species unavailable.

Again, this forces a reduction in the dominate species and restores equilibrium.

Throughout history, plant growers have found methods to cope with that system.

In the early days of exploration of the United States, farmers would grow wheat or corn until productivity went down then move on to another area, clear it and start over. This worked until they ran into the Pacific Ocean.

Next came the practice of crops rotation that worked well for many years. Under this system, a form of biodiversity was utilized in that crops were rotated through a three-year period and the field was left fallow in the fourth, going back to biodiversity.

With the advent of synthetic fertiliser, pesticides, and mechanization, growers moved more toward a two-year rotation or no rotation system. The fallow season was no longer feasible.

From the time we introduce a monoculture, nature is fighting us to return to biodiversity. On realizing this we can react in a couple of ways.

One is to return to the natural system which would mean that one person could no longer feed many. This, in turn, would require us to return to foraging for food.

This, though it may appeal to a certain portion of the population, is impractical.

What we need is a new operating system geared toward recognizing that we are violating a basic law of nature and we should utilize tools that decrease the effects of this violation. Since we can't grow in a biodiverse system we need to create an environment in the soil that would exist if those plants were there.

There is a concept in plant pathology called the disease triangle - host - environment - pathogen.

To offset the effects of the loss of biodiversity, we can either change the plants and go back to biodiversity, kill all of the pests or change the environment. This last is the path we must take.

Incorporating bio or organic fertilisers with synthetic fertilisers brings a certain biodiversity with it.

Turning under plant material and the use of compost that is plant material helps reduce the effects of biodiversity loss.

Use of cover crops or green manure crops actually increases biodiversity.

Biostimulants, a relatively new class of product, can help reduce the effects of monoculture. Some of these materials are enzyme-based and give good although specific and temporary relief while others replace bacteria in the soil profile.

Sustainability is a concept whose time has come. It doesn't require a scrapping of the old system, but it does require a shift in the way we approach the growing process that addresses the real problem. □

Nick Fazekas and Megan Dixon of Wesfarmers Landmark Viticulture Division join John Jashar at the Seventh Annual Vititec Expo

Wesfarmers Landmark has showcased the latest inputs for the viticulture industry at a workshop and supplier expo in South Australia.

The company is the major sponsor for the Vititec field days held in Penola/Coonawarra.

A team of Wesfarmers Landmark staff from the Penola branch, as well as the Adelaide and Sydney offices, were on hand to provide wine grape growers with any help or information they needed.

Using the theme "From Bunch to Barrel", Vititec focused on encouraging wine grape growers to become more pro-active in growing quality grapes.

The two days were held to encourage growers to focus on the final outcome of their endeavours - the wine rather than the grapes, Southern Division marketing manager for Viticulture, Nick Fazekas said.

Seminar speakers urged growers to gain feedback from the corporate wineries/winemakers on how they could improve their wine quality from a vineyard perspective rather than just producing quantity.

To help growers achieve this aim a number of workshops were sponsored by industry members. Wesfarmers Landmark invited McWilliams Wines representative Kerry Degaris to present a workshop that focused on managing yield to optimise wine quality.

Mr Fazekas said more than 170 growers attended the workshop. He said the expo attracted between 300 and 400 wine grape growers, and displayed products from numerous industry suppliers.

To celebrate the continued success of the wine industry, a dinner was held for 220 growers and event sponsors who enjoyed delicious local produce and excellent Coonawarra fine wines.