

# HORTICULTURE-VITICULTURE NEWSLETTER SPRING 2020



## VALUE OF AGRISEA BIOSTIMULANTS IN ADVERSE WEATHER CONDITIONS

Increasing amounts of scientific research has been done on the anecdotal observations regarding how resilient plants are to adverse weather conditions if treated with Bio-stimulants as part of their seasonal management process.

There is a general consensus of opinion that the ability of plants to be able to withstand adverse weather conditions (cold, heat, wind, etc.) improves with minimal long term effects on growth, vigour, and more importantly crop yield.

A variety of theories have been presented and they depend on what has been applied and when. The application of Foliar bio-stimulants to young growing plants has shown there is a significant freezing point depression during frost events at the bud level. This is quite possibly due to the higher specific gravity reducing the freezing point. This can amount to as much as 1.5 – 2°C which is significant, particularly in vineyards in early spring around bud burst. Similarly, at the soil level, if bio-stimulants have been applied on a number of occasions, there is a significant improvement in soil temperature as compared to non-treated areas - again around 2°C.

In addition to these measurements, it has been shown that plants that have been subjected to frost are also quickly able to recover, partially due to readily available trace elements and catalysts which encourage new growth.

A number of overseas studies have shown crop resilience due to heat and water deprivation for short periods when bio-stimulants are applied as part of the spray regime on a regular basis. Recovery from these abiotic stresses occurs more quickly with less effect on crop yield if bio-stimulants have been used.

AgriSea, as the pre-eminent bio-stimulant company in New Zealand, has high quality, cold brewed bio-stimulants made from N.Z. native seaweeds that ensure the best available array of compounds are available for plants in a chelated natural form. Using AgriSea products as a key component of your spray programme will ensure that you get the benefits mentioned above as well as a significant array of trace elements and compounds that will ensure the best benefit for your crop.

Please contact your local Hort/Vit AFC for further information.

## CONGRATULATIONS TO OUR VERY OWN CLARE BRADLEY...

...for taking out the supreme award as the Rural Woman of the Year, more details in attached link

Clare Bradley from pioneering seaweed company AgriSea has been named the supreme winner at the NZI Rural Women NZ Business Awards.

Bradley earlier won the award's Love of the Land category and said it was a good opportunity to celebrate rural businesses.

I think people's remoteness is not a reason or an excuse anymore not to develop businesses.

**"It was really great to be able to celebrate everyone's passions and achievements and the multiple hats we all wear as rural women"**



## MARKS CORNER

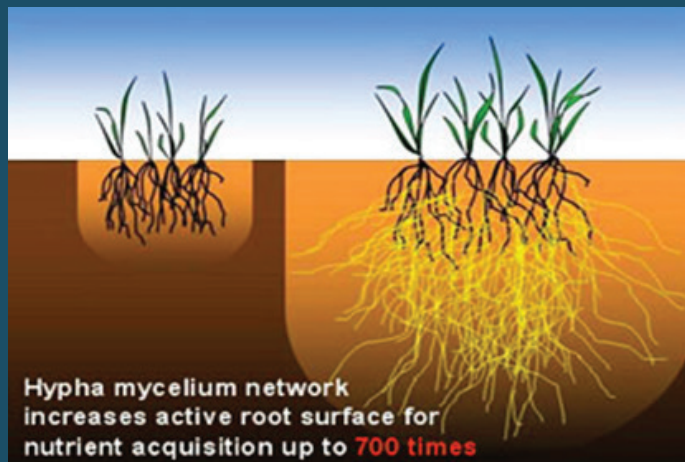
Welcome to Mark's Corner, where we offer some additional information on topics that are important to your business.

### Mycorrhizal Fungi: Nutrient Powerhouse

There has been a lot of discussion around the necessity of having a good mycorrhizal population in the soil if we are to grow good plants or vines. I thought it would be of value to provide some information on why they are so important:

Mycorrhizal fungi are in fact many different species of fungi, not just one specific type, and they vary depending on the soil type, climate and crop being grown (whether that is grapes, kiwifruit, avocados, citrus, apples, etc.) There also may be as many as 15+ different fungi in partnership with the plant, each providing a different benefit. There are at best estimate

around 20-25,000 different mycorrhizal fungi species. For Horticulture and Viticulture there are two main types of mycorrhiza: ecto (outside the root cell) and endo (inside the root cell). Primarily, endo mycorrhiza are the most important as they facilitate the rapid transfer of trace elements to the plant enabling it to grow quickly. Ecto mycorrhiza have a useful role also in nutrient provision; the mechanisms of transfer are somewhat slower but are better for providing less abundant trace elements for the plant's needs. They are particularly beneficial to those crops that rely on good availability of micro trace elements such as Boron, Cobalt, Selenium, etc.



### Why are Mycorrhiza important?

Mycorrhizal fungi form symbiotic relationships (partnerships of mutual benefit) with plants to the advantage of both partners. It is estimated that 95% of plant species form mycorrhizal associations. The process of symbiosis involves the plant providing sugars from the photosynthetic process to the mycorrhiza in exchange for water and trace elements (esp P). Mycorrhizal fungi are able to obtain these nutrients by two main mechanisms, passive absorption and by releasing chemicals that will solubilise trace elements - especially in clay - and also breakdown organic matter to release nutrients. The main advantage for the plant is that the surface area ( up to 1000x) of the mycorrhizal fungal strands are significantly more than for the roots of the plant alone. This enables better access to the nutrient it needs by working with mycorrhiza through chemical signalling to obtain trace elements from a wider area in the soil.

**In addition, there are also many different contributions mycorrhizal fungi make to the soil biome including:**

- Breaking down clay and improving Organic Matter/Humus.
- Promoting defence response in plant under disease pressure.
- Alleviating effects of salt stress in marine clay environments.
- Communicating responses to insect attack between plants.
- May excrete enzymes toxic to parasitic nematodes.
- Can modify the uptake of toxic heavy metals in soil.
- Improving physical characteristics of the soil through the release of glomalins.
- Facilitating nutrient transfer between plants during times of high nutrient demand.

# MARKS CORNER CONTINUED

## INTER-RELATIONSHIP BETWEEN CALCIUM & MAGNESIUM:

Calcium is the foundation of all biological systems. It is a fundamental growth inducing nutrient and the base against which other nutrients are reacted to release energy for crop and microbial growth. As a percentage of base saturation Calcium should occupy around 70% for good soil and plant health. Resulting from this is better soil structure and consequently better availability of other essential plant nutrients.

Calcium helps plants form better root systems and structural components of the plant. Once incorporated into the cell cannot be removed and transported so a continuous supply is required for plant use throughout the season. Often the lack of availability of calcium is the limiting factor in crop production. Excessive use of Nitrogen and other salt fertilizers will often result in lock-up of Calcium even though there appears to be ample present in the soil. High levels of Calcium in the soil at the beginning of the season doesn't mean there will be enough available for good crops.

Magnesium is an essential part of the chlorophyll molecule consequently being a moderator of, or limiting factor in the photosynthetic process. It is a necessary element for plant health, and in conjunction with Calcium is involved in many of the chemical processes that involve protein production, enzyme functionality, energy generation and release at the cellular level, and particularly important, aids in Phosphorous uptake, and starch translocation.

Excess magnesium levels can cause Nitrogen instability and potentially increases loss to groundwater and contributes to compaction of soil if applied to excess.

Magnesium as a percentage of Base Saturation is at its most effective at 10-12%. At this level Magnesium along with Calcium at 70% will provide the optimum growing conditions for plants. The relative ratio of Calcium:Magnesium to achieve optimum growth conditions (providing other parameters are normal) should be around 7:1.

**In addition to growing improved crops there are other benefits from maintaining Ca:Mg ratio close to 7:1. The main ones are:**

- Positive effects on Soil structure.
- Improved humus content.
- Increased biological activity.
- Increased solubility of other trace elements.
- Improved soil Nitrogen cycle.
- Improves the solubility and availability of important micro trace elements that can be critical in certain horticultural crops for good yields.

As an integral part of your cropping management, good quality bio-stimulants should be applied at both the soil and foliar level to ensure that the solubility of these two key trace elements remains at the best possible level. This will aid significantly in the ability of the soil to maintain the Ca:Mg ratio at the desired 7:1 without the need for excessive side dressings of fertilizers.

## Spring Specials

20ltr	100ltr	200ltr	1000ltr
\$20 OFF	\$50 OFF	\$100 OFF	\$500 OFF

Special Pricing runs until the end of September 2020.



**\$85.00**  
**per bag**  
**incl. GST**



# Soil Nutrition versus Foliar Nutrition

We often get asked why we cannot use the foliar and soil as one product for both. Although you will not do any harm using the soil nutrition on foliage and the foliar nutrition on soil, they do go through a different brewing process to achieve different results.

Agrisea soil nutrition has a pH of 8-9 and Agrisea foliar nutrition has a pH of 6. Due to this, there are some compounds that are active in the soil nutrition that are not active at the lower pH of 6 that is present in the foliar nutrition. Due to the brewing process, the soil nutrition product has its biostimulants in solution rather than being extracted giving it a different mode of action to foliar. This is partly due to the fact that the soil nutrition is brewed outside, interacting with the environment. This alters the structural makeup of the compounds to make them more suited at working with soil biology and stimulating plant roots rather than being actively absorbed through the leaf.

The mode of action of our soil nutrition is slower as a result; biostimulants that are taken into solution are capable of stimulating plant roots to secrete compounds/exudes that will increase trace element solubility. Soil nutrition has cytokinins, soil auxins and gibberellins that stimulate roots to secrete glomulin and citric acid. These are key components of phosphate solubility and retention of sulphur, and helps with trace element uptake. In addition, the soil nutrition product stimulates mycorrhizal fungi which increases surface area to provide nutrients to the plant roots.

Other compounds in the soil nutrition improve formation of humus/carbon sequestration. The compounds work on organic matter and convert it to the stable form of humus. Humus is important for moisture retention and holding nutrients in soil profile.

On the other hand the Agrisea Foliar Nutrition is a more reactive product which is reflected by the pH of 6. The extraction process is more active which means compounds removed from seaweed are more reactive. The molecular structure of the compounds as they are extracted makes them more reactive in the way they bind and move across the cell membranes. The foliar nutrition stimulates the stomata to open and enable the transfer of active ingredients across the cell membrane quickly due to the nature of cytokinins and auxins in the product. They cause a reaction in the leaf for stomata to open and trace elements and nutrients move rapidly into the plant. However, even though the stomata are open, the trace elements are all bound by the proteins so there is no option of water loss. The protein solution stops water loss due to the osmotic pressure gradient.

Foliar nutrition contains catalysts for photosynthesis through stimulating chlorophyll activity; as a result of that, the level of carbohydrate improves and can be utilised by the plant as required. The foliar nutrition also contains biostimulants which stimulate the production of compounds that resist sucking insects.

## Visual Soil Assessments

Did you know that our Field Consultants offer complimentary VSAs (Visual Soil Assessment) to current clients? For several years now, AgriSea Field consultants working within the agricultural industry have offered their clients a VSA service.

There are now specialised field guides available for orchards and vineyards, and our service has been extended to offer specialised VSAs to our horticulture and viticulture clients. Physical and biological soil properties can be identified through visual characteristics. These visual indicators are closely related to your soil quality.

There are several soil indicators and each one is given a visual score from 0 (poor), 1 (moderate), and 2 (good). These scores are then weighted depending on how important the indicator is. The score is given by comparing the soil in the property to the photographs in the field guides. There are a variety of field guides available including orchards, vineyards, dairy, hill country, arable, and olives. The correct score card/field guide will be chosen for your soil comparisons.

A VSA allows you to assess the quality of your soil. The next step is to solve any issues that may be identified. Talk to your Field Consultant for assistance.

# Kiwifruit Grower Focus: Early start, higher Dry matter and great cane regrowth.

Lynn and Brian Beach brought their Katikati Orchard 'Cranford Lodge' in 2016. The organic orchard had previously been neglected and they needed an organic product to improve vine health. They started using Agrisea Foliar nutrition six times a year at 5L/hectare; the first application is at leaf break in November and then every 6 weeks after that. Lynn says 'the product is easy to use, we notice better leaf colour, vine health is improved and we get good cane regrowth'. With the use of Agrisea they are getting an earlier start and higher Dry Matter. This relates into clear economic benefits; with their early start they can get an extra \$2/tray or more, and similar increases in payments for the higher Dry Matter. In March this year their Dry Matter was already at 0.86. They found even without the use of hicané, when they were still organic, they were managing to get an early start.

Their second orchard is also in the Katikati district. On this orchard they have been using Agrisea soil nutrition for four years, in Spring and in Autumn, at the recommended rate of 20kg/hectare, with the goal of improving the soil. They started using the soil conditioner as some parts of the block had been contoured and the soil in these areas contained a lot of clay. They found that the composition of the soil improved and their organic matter increased with the use of the AgriSea soil conditioner. This season they have also started using AgriSea foliar nutrition on the orchard as it was such a dry season, and they put the way the vines coped with the drought down to the use of the foliar nutrition. They had no vine crumbling and that was also attributed to the AgriSea soil and foliar nutrition. In addition, Cranford Lodge Orchard had a couple of blocks where the replacement cane had previously not been so good; this year, with the use of AgriSea foliar nutrition, they have noticed that cane replacement was much better.



Although this year there were no early start or DM payment, they know that their vines are well set up health wise for good production going forward. Both orchards are still increasing in number of trays/hectare despite the drought this past season. With these positive results, Lynn and Brian will keep using AgriSea Foliar and Soil nutrition on their orchards.

## New Kiwifruit Orchards with AgriSea

New kiwifruit orchards are continuing to be established in many parts of the North Island. Agrisea products can help in successfully establishing new orchards, giving them a great start, as well as continuing to provide ongoing nutritional support to already established orchards. Agrisea products are a sustainable NZ seaweed biostimulant, available in a liquid and solid form. The products allow for a sustainable way of growing great crops with less need for chemical fertilisers and intensive spray programmes.

### Establishment Programme

- If using glyphosate to prepare land for planting, an application of Soil Nutrition at 5L per hectare will help counteract the detrimental effects on the soil biology.
- When the orchard is ready for planting, apply Soil plus at 20kg/hectare to stimulate the soil biology and improve the soil structure.
- At planting, either dip the plants in a 5% solution of Soil nutrition or apply 5% soil nutrition to the bag. In addition, pour 100 mL of 5% soil nutrition into the hole base to stimulate root development.

### Ongoing Programme for Agrisea

- **Apply AgriSea Soil Nutrition:**  
5L per ha (dilute 1:100), two times per year, in Spring and post harvest in Autumn, to encourage soil health and root development. Alternatively, apply soil nutrition in the solid form of Soil plus at 20kg/hectare.
- **Apply AgriSea Foliar Nutrition:**  
1st Application: 7-10 days prior to flowering (to aid flower and pollen development)  
2nd Application: Mid-blossom or immediately post-blossom  
3rd Application: 14 days post-blossom  
4th Application: 45 days post fruit set for green and 80 days post fruit set for gold.  
Apply in quick drying conditions and avoid spraying in high temperatures.

## For the Bee Keepers – Research Findings

AgriSea has several horticultural customers that also benefit from using our Bee Nutrition product in their hives. A summary of the research below outlines the benefits gained.

In 2017, AgriSea received a Callaghan Innovation Grant for Plant and Food Research to investigate how our Bee Nutrition benefits bee health. The independently run trial provided a great snapshot of what our product benefits are and formed the basis of an internally run trial the following season.

AgriSea, alongside commercial beekeepers from Hunt and Gather Bee Co, Dansar Bees, and Pacific Coast Technical Institute carried out a trial across three apiary sites in the Raglan, Paeroa, and Putaruru regions. The trial commenced last Autumn (April 2019 ) and ran right through until the end of the 2020 honey harvest, with beekeepers independently managing their hives and collecting data on a regular basis. AgriSea hives were fed in Autumn at 30 ml/L sugar syrup and control hives were fed sugar syrup only.

Results analysed to date show a consistently higher amount (%) of capped honey cells in the AgriSea hives across all sites. Furthermore, those AgriSea hives started capping honey earlier in the spring than the control hives. This was reflected in the increased honey yields taken off AgriSea fed hives with increased production ranging from 20 - 123%.

Colonies that had the late summer supplement feeding always came out of winter stronger than hives that had a good amount of honey stores and didn't require supplement feeding. A noticeable difference was the larger spring brood nests in the seaweed supplemented hives. These hives consistently went on to collect at least an extra box of honey due to having more foragers available. "I have continued to use the Agrisea Bee Nutrition with the same consistent results every year."

*Dan Martin Dansar Bees*

## Nga Waka Vineyard

Mike Kershaw has been managing Nga Waka vineyards in Martinborough for 25 years. Fifteen years ago he was introduced to Agrisea Foliar and Soil nutrition products. The results have been fantastic.

Prior to using Agrisea he had been using another seaweed product, however. Mike said that **"once I started using Agrisea I never looked back."** The plants started, and continued, doing so much better. The plants are healthy and keep going through the season, they have deep green leaves with good photosynthesis.



Mike's goal for his crop is good clean fruit, good bunch weight, and good brix levels. There are many factors that influence this, and although good weather during flowering is paramount so are good soil and vine health. The latter two are achieved and attributed to the ongoing use of Agrisea products. Mike finds that using Agrisea helps to reduce powdery mildew, which can really knock the Chardonnay vines around.

This year, vines have been replaced in their top Chardonnay block. Even though Mike was expecting the soil to have improved after using Agrisea soil nutrition for 15 years, he was amazed at how much it had improved. When they started pulling out the old plants they noticed how friable the soil now was and how much the soil structure had improved. After the old vines had been removed, a contractor harrowed it and then after cultivating it was 'dead smooth'. Previously, the soil had been clumpy and massive but now, the soil structure was fabulous and teeming with worms.

He said that even though it can take a few years to really see the big results in the ground, when the soil biology really gets going and the soil structure starts improving, then the results are really great.

With the soil in such great condition, which Mike attributes to 15 years of Agrisea soil nutrition, all they had to do was post and plant. They dipped the plants in 1:50 solution of soil nutrition to give the roots and vines a boost and away they went. Since then, the plants have had several foliar sprays to assist their development and growth.

Mike says there is no doubt that they will continue to use Agrisea Soil and Agrisea Foliar nutrition in the new block and across all the others under his care.



# OVER THE LAST YEAR

**It's been a busy 12 months for AgriSea but it's not until you start to take a look back you realise why time flies!**

## Jacinda pops in for lunch

It was a privilege and an honour to be asked by the government if we had time to host our Prime Minister and members of her staff. We organised an informal talk about AgriSea and the work we are doing, had some yummy lunch together, and gave a factory tour. The visit was on a Wednesday when we as a team sit down for a home cooked meal, often prepared by Jill; it was also school holidays so the whole staff and their children were involved too. Jacinda enjoyed the tour. We look forward to continuing the conversation about the importance of seaweed to our marine ecosystems and to our economy.



## New building gets a makeover

We are continuing to improve our capabilities with our new 20 acre rural property here in Paeroa. The team have been moving walls, purchasing new equipment, painting, planting trees for bees. We are in the process of replanting an old Wetland with the support of the Wetlands Trust and Te Whangai Trust and phase one is set to be completed in late August.



## Future technology & R&D

AgriSea is very much a leader in both bioactives and innovation. We work with a range of partners including AgResearch, Waikato University, Callaghan Innovation, PCTI, Lincoln University, Otago University and many more to ensure we are continuing meaningful research, which helps to support our environment and our people for generations to come. We have some big announcements coming up in the next few months so look out for this in the New Zealand Herald and on our website.



## Education/Filming/Media

We were again fortunate for the fifth consecutive year to bring over International Soil Scientist Dr Christine Jones. She is an expert on regenerative farming and provides farmers and growers practical and applicable tools to enhance their farms and animal health. We had over 700 attendees across five workshops. Later in 2020 we hope to bring her out for more education workshops. We have hosted film crews from both New Zealand and overseas over the last 12 months with features around sustainability, seaweed and our environment, and the future of farming. We have also been in multiple articles including a double page in the NZ Herald. We are proud of the interest in seaweed and the great work we are doing back here with our amazing team.



## Community

Our communities are the heart of AgriSea and our team - be they at the top of the island or the bottom. We do our best to support as many community groups as possible. Some of the highlights for us this year were the Thames Valley preseason game between the Blues and the Chiefs (please don't ask for the score) supporting NZ Touch, The Highland Games, and having lots of school/university groups through our factory, winning the best business host with Waikato University, supporting Bees in Schools, and holding planting days. Our tent and BBQ trailer are proudly there for community and non-profit groups.



# There's an AgriSea Field Consultant near you!



Marianne Salmon  
Horticulture Specialist  
021 895 345



Brett Martin  
Northland  
027 263 3315



Mark Powick  
Nelson/Marlborough  
Technical Sales Support  
027 666 2001



Paul O'Donnell  
Canterbury/West Coast  
021 992 154



Chris Boys  
Southland/Otago  
027 345 9645

We're hiring in the  
**Upper South Island**  
<https://www.seek.co.nz/job/50403943>

## WATCH OUR SUSTAINABLE SEAS VIDEO

GOOGLE SEARCH "AGRISEA - YOUTUBE" TO VIEW  
<https://www.youtube.com/watch?v=k7U5rcMBqzU>



**Fieldays®  
Innovation  
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Established  
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*All the best for the season ahead*

From the MIGHTY team at AgriSea.

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