



Canterbury Commercial Organics Group

Newsletter

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A Ring Fence in the Real World?

There is a considerable amount of debate in the UK organic movement about GMO's their implications and the notion of 'ring fencing' (completely separating) organics from the rest of agriculture. Laura Davis, a producer in the UK, has made strong case for bringing some pragmatism to the debate. Below is a letter she sent to Organic Farming, the leading magazine for the organic industry in the UK. Its sentiment is equally applicable to our situation in New Zealand.

Over the last few weeks I have been following the reports about the genetically modified crop trials and the Court case pursued by Guy Watson with regard to the possible contamination of his sweetcorn by 'pollen drift'.

Clearly, the trial of the genetically modified corn was illegal and should not have been allowed to proceed. However, my concern is about the issue of 'contamination' of organic crops by pollutants from outside the organic farming system. The logic of the argument for removing the organic certification of Mr Watson's sweetcorn crop is based on the idea that, as quoted in the news section of the last issue of Organic Farming, "consumers rely on the fact that our organic food is free from genetic contamination".

I have always been under the impression that no organic product has ever been sold on the assumption that it is free from any kind of contamination. I remember the argument in the early days of the negotiation leading to the European Regulation on Organic Farming. In essence those who wanted a system based on the 'purity' or otherwise of the end product were finally forced to concede that the only workable regulatory framework had to be based on the integrity of the *farming system*, not the freedom from contamination of the end product. All we can say about our production system is that we have applied organic practices with the boundaries of our own farms.

If we are to start withdrawing organic certification from 'pollen drift', it could be persuasively argued that certification should also be withdrawn from farms or crops that suffer any kind of contamination from outside the system. Clearly, we live in a world where such contamination risks are many and widespread. If we are to follow the 'pollen drift' logic to its conclusion, the issues of spraydrift, and kind of industrial contamination and the use of irrigation water will require a program of testing of the end product. Many of us use irrigation water. Much of this water (especially in areas where dairy farmers grow maize, e.g. Devon) contains atrazine, and other forms of pollution, which theoretically could turn up as residues in our crops.

Does this mean that organic farming would become impossible in, for example, areas downwind of a power station or other industries, or where water resources contain detectable residues of biocides or other pollutants?



What about the use (albeit controlled) on conventional livestock feeds and veterinary drugs? Or will organic farming only be allowed where environmental 'purity' can be established? Once we start to think seriously about the implications of claiming that any organic product must be free from any form of contamination, it becomes clear that we are dangerously out of our depths.

This is not an argument in support of genetic modification, still less an argument in support of illegally conducted trials. It is an argument to consider the implications of believing that we can, or should, 'ring fence' organic farming systems to prevent any form of contamination in the end products, based on perceptions of 'purity' and 'consumer confidence'. There are other compelling philosophical, environmental, social and economic arguments against GMO technology. Let's base our case on these, where we can be on much firmer ground.

Laura Davis - Letter to Organic Farming

St Martins New World Makes GMO Stand

St Martins New World in Christchurch has become the first supermarket in the country to demand to know which of its products are genetically engineered.

Owner Brian Newbery, who is president of the local Association of Grocers in Canterbury and has been in the industry for 40 years, says it may take several months to gain the relevant information from suppliers and manufacturers. However once solid corroborated information started arriving he would label food accordingly.

"Many consumers are very concerned that we can't tell them right now which foods definitely contain genetically engineered ingredients and which don't," Mr Newbery said today. "I'm upset that as food retailers at the frontline, my colleagues and I are selling products containing unknown DNA which has been added in quite an underhand and secretive way; denying my customers a choice.

"I can't understand, when so many ingredients are included on existing labels, why regulatory authorities don't add genetic engineering characteristics to the guidelines," he said.

St Martins has one of the largest organic produce sections in New Zealand, but Mr Newbery says it isn't only organic consumers who are seeking labels about genetic modifications.

The Australia New Zealand Food Authority made a decision on food labelling last December to require labelling, but the concern is that by the time it reaches the supermarket shelves it will be so watered down so as not to include any processed goods, such as sugar and soya bean oil?

Mr Newbery says he is concerned that while ANZFA includes a number of industry representatives, none of the directors represent New Zealand grocery retailers, small manufacturers or consumers.

Trudy Burgess

Bumper Field Day!

A bumper field day has been organised for the 21st march with visits to three farms and guest speakers.

The day starts at 10.00am at "Robbies Patch" run by Robyn Patchett who grows 1800 pip fruit trees that have been Bio-Gro certified for seven years. They have over 10 apple and 3 pear varieties, which are sold to the local market, both direct to rural customers and via city retailers. The visit will include a walk round the orchard and discussion on organic pip fruit growing.

Also speaking at "Robbies Patch" are Dr Graham Burnip an entomologist working at HortResearch who will discuss the latest developments in biological pest control, and Don Pearson who is currently researching the difference between the soils of conventional and organic orchards, including worm activity. "Robbies patch" is situated on Bethels road (off the Leeston Road at the Selwyn River Bridge) between swamp and Corbetts roads in the Ellesmere district.

At 1.00pm we meet Peter Mony at his 33ha cropping farm for a BYO picnic lunch followed by a farm walk and discussions of his crops and the farm business. Peter is self employed in an international business consultancy service, and has worked in a wide range of management jobs both in New Zealand and overseas. Part of the reason for originally buying the farm was his daughters interest in horses one of whom is now a champion rider. This



also gave Peter the chance to put his long held interest in environmental matters into practice. He set himself the goal in '94 of doubling the business every year, and has succeeded in doing so. This year he is partly growing his own crops and also leasing land to other organic growers. Crops include peas, linseed, dandelion and squash. Next year the family is moving into Christchurch so he is taking the unusual step of leasing all the land. The lease includes a number of agreements not only on rent but also production issues to ensure that the land continues to be organically certified. Peter Mony's farm is on McWhas Road, off the Hororata - Dunsandel Road, approx. 8km from Dunsandel.

The culmination of the day is a visit to John, Trish and Kelvin Hicks 115ha mixed cropping farm "Willowmere" at 3.00pm. The Hicks run about 1000 head of sheep along with growing a wide range of crops including peas carrots potatoes, pumpkins, and silver beet, which are sold to Heinz-Watties and Only Organics. Prior to buying Willowmere in 1991 and converting it to organics in 1995 the Hicks owned and ran a organic goat milk business in Australia for 15 years. On the cropping front they have also had great success taming the dreaded Californian thistle. The visit will include a walk round the property and discussions of the crops and the farm business. Willowmere is situated off Duncans road approximately half a kilometre from the turnoff from the Hororata Road opposite the Hororata race course.

For further information please contact Robyn Patchett on 03 3295725. Looking forward to seeing you all there.

Merf

Field Day Report

The 4th December joint Heinz-Watties & CCOG field day was a great success, with over eighty people attending, and despite the last minute cancellation of the first section at Len Johnson's. While this was a disappointment, the rest of the day provided a range of valuable information, ideas examples of superb organic crops and a great chance to meet and discuss organics and farming with friends, other farmers and experts.

We started with a walk round Wyenova Farm, firstly looking at Ivan's pea and cereal crops, both of

which were very healthy, superbly even and phenomenally free of weeds. Ivan has refined his techniques for cultivation and weeding over the years and finds that the soil and crops are continually improving. The pea crop was also the site of an Envy compost trial. This is a large scale field trial looking at the effects of Envy compost at two different rates of 12.5 tonnes and 6.25 tonnes to the ha and a third treatment of 12.5 tonnes per ha with additional blood and bone. Unlike many previous compost trials this one is long term and will study the effects of the compost through the rotation to provide essential long term information on the composts effects.

Next we moved to the intensive crops, including processing carrots for Heinz-Watties. This is the first time that Ivan has grown this crop and has discovered the importance of good pre-emergence weed control in carrots, as post emergence control in the row is dependant on hand weeding. We also viewed the wide range of crops Vanya grows such as squash, beets, and radish for making the pickles and chutneys she sells at various markets round Christchurch.

George Feitje

This was followed by two presentations, the first by George Feitje, the research and development manager of the Living Earth Company who produce Envy compost, and the second by Nigel Van Dorsser of Essential Nutrition. Belinda Allen of the Living Earth Company filed this report on George's presentation.

Owing to the increase in supply of raw materials, Garden City Composting / Living Earth Company is looking to supply the agricultural and horticultural markets with an organic compost produce in the Christchurch area.

Belinda Allen, Sales Manager for the Garden City Composting / Living Earth Company joint venture says we have been overwhelmed with the response since the field day from organic and conventional growers, after we offered them a chance to do their own growing trails with a free 10m³ of organic compost (ex yard) to trial on their own properties, and after that at \$5 / tonne ex yard.

We look forward to a long term relation ship with this market sector and are keen to continue



to hear from people interested in wishing to know more or to trial the product. The one condition, says Belinda, to the supply of the compost is it is not to be resold.

There is no question that all farmers acknowledge the importance of organic matter for improving the soil, the problem in the past has been getting enough of it at the right price. At a price of \$5 / tonne, Garden City compost make this a very attractive option to growers to supply nutrients to their crops and or to complement their existing fertiliser applications to their land. The cost benefits to the end user are critical to the acceptance of this product as a viable alternative in the agricultural and horticultural market. By adding organic matter to the soil it helps to:

- Lower soil bulk density
- Increase soil carbon content
- Modify soil water holding capacity
- Improve crop yields
- Supply nutrients in a slow release form
- Reduce leaching of nutrients to ground water
- Suppress soil disease

Value of Nutrients in Compost

George Feitje, Research and Development Manager of the Living Earth Company says this product does not undermine the use of nutrient fertilisers, but seeks to improve the efficiency of these and to reduce the loss of such fertilisers through leaching. This is because the organic matter helps to bind nutrients such as nitrogen, to the soil particles and so improve its availability to plants aiding the potential to increase crop yields. Research has shown the best results were where compost and fertiliser were applied, compared to where compost only or fertiliser only were applied.

Although compost is not a fertiliser, it contains significant amounts of nutrients. Even if all other benefits were ignored the decision to use a compost product could be made on this basis alone. In George's presentation he showed that the value of the nutrients in the compost to the farmer is in excess of \$44 / tonne (based on

values of 2.75% N, 0.46% P, 1.65% K) making the purchase price of \$5 / tonne a viable option.

Belinda Allen

Nigel Van Dorsser

After George concluded his talk on composts Nigel Van Dorsser further enlightened us about the importance of organic matter in soils. Nigel studied soil science at Lincoln University before going on to start his own consultancy and supply firm 'Essential Nutrition Ltd'. Nigel first discussed the importance of good soil structure. This is an area of where many people are confused by the terminology. Soil texture means the ratio and size of particles that make up a soil, such as sand, silt and clay. This to a large extent determines the way a soil behaves and what its structure will be like. Soil structure means how the soil forms into particles and aggregates with air spaces between them called pores, rather than just individual grains as in a pile of sand. Nigel highlighted the importance of a good soil structure with a high level of porosity, for healthy plant growth. He also explained how a lump of soil with a good structure will break to produce a rough surface, while a lump with poor structure will break with a flat smooth face. The organic matter content of the soil has a considerable effect on structure. A soil with a low level of organic material have a poorer structure with fewer pore spaces than the same soil with higher organic matter content.

Nigel then described how some aspects of organic production can be worse for the soil compared to alternative conventional techniques. Mechanical weed control is a particular problem as there are often several extra passes by tractor mounted weeding machinery after crop emergence and also increased pre drilling and pre emergence work such as blind harrowing and false seedbed techniques. The extra tractor passes increase the amount of soil compaction and the cultivation and weeding incorporate additional oxygen into the soil which causes a decrease in soil organic matter. Alternatives such as zero till techniques where previous crops are killed with herbicides and then the next crops are direct drilled through the stubble have considerably fewer tractor passes and no cultivation, which leads to a soil protecting, surface mulch, of crop residues. Organic systems thus need to compensate for this by maximising the amount of



organic matter being returned to the soil, using restorative crops, ideally pasture, and using other techniques such as undersowing to reduce cultivations.

Green Manures

Green manures also play a role in maintaining soil organic matter through their benefits are often overstated. Many green manures have low carbon nitrogen ratios so they decompose quickly releasing their nutrients and add little to the long term organic matter in the soil. However they are valuable in protecting soil from erosion, and retaining nutrients that could otherwise be lost. There has also been some debate recently over whether the benefits of green manures are lost if they are grazed as opposed to incorporated. Nigel notes that the often considerable amount of cultivations required to incorporate a green manure can negate the benefits of the extra organic matter. In regards to grazing there is not much difference between having the material eaten and digested by a sheep or eaten and digested by a microbe. The net result is very much the same in that the hard to digest material is left little altered and the rest is broken down into more simple forms that can be adsorbed by plants.

Concerns have also been expressed about the loss of nutrients in the green manure the stock. If there is concern about the loss to stock from grazing green manures it equally applies to grazing pasture. It is therefore just one example of the nutrient mining debate within organics. From my perspective while organic systems need to optimise the circulation of nutrients within a holding, in a commercial situation there is a net export of nutrients from the farm via crops and livestock, only some of which can be reclaimed from the atmosphere such as carbon, and nitrogen. If there is not to be a long term depletion of nutrients then the nutrients lost via produce need to be returned to the farm, which requires the importation of fertilisers and or organic residues. Taking a historical view of soils, the most fertile and productive soils are new soils - alluvium from floods and some volcanic soils. The least fertile are the older soils, that despite the slow weathering of the parent material to release more nutrients, gradually become depleted due to processes such as volatilisation and losses to water. Often soils have many decades or centuries of reserves within them, but unless lost nutrients are constantly replaced they will eventually run out.

Nigel considers to get the optimum benefit from a green manure it should be mulched left on the soil surface. However with all farming systems especially organic there is always a trade off between numerous objectives and the rapid turn around gained through grazing for example can outweigh such optimum use of the green manure.

Soil Nutrients

In the second part of his talk Nigel moved on to soil and plant nutrients. He stressed the importance of having a correct balance as well as sufficient levels of soil nutrients and the correct pH. Several nutrients interact with each other, and if one is too high then it can reduce the availability and or uptake of other nutrients, in a similar way too high or too low a pH does. With restrictions on the types of fertilisers permitted under certified organic systems to mostly slow release types, Nigel stressed the importance of planning ahead for nutrient requirements, particularly with nutrients such as phosphorus and sulphur. Having highlighted the importance of correct nutrient balances Nigel described the inherently low trace elements in Canterbury soils due to many having their origins from Greywacke rock. Trace elements are vital for a health pest and disease resistant crop, and Nigel considers it important that farmers address such trace element deficiencies to ensure their crops perform to their optimum. Ensuring optimum trace elements levels is also important to ensure that the food has a good balance of nutrients. Deficient soils produce deficient plants.

Close of Play

To finish the day there was a BYO BBQ, which was thoroughly enjoyed, and Ivan and Vanya very kindly provided some very tasty vege-burgers and their own pickles as well. The BBQ was a great opportunity to discuss the day, and the many things going on in organics and farming as a whole. CCOG would like to thank Bruce and Anthony from Heinz Watties for helping organise the event and providing the BBQ and other equipment and a special thanks to Ivan and Vanya for being such hospitable hosts and taking time to show us round their farm and host the seminars and BBQ.

Merf



Ideas for Fly-Strike

Both conventional and organic sheep farmers have had a hard time keeping the flies at bay this season. I have had some success this year using a homeopathic remedy (blowfly nosode) and a pyrethrum based spray. I'm sure we would all benefit from learning of successful organic remedies so **please** send in your advice for battling the fly-strike and we'll publish it in the next newsletter. Name and source of product would also be helpful.

Robyn Patchett

Organic Weed Control Part 4

Cultivations and Seed Bed Preparation

Cultivation can have a huge effect on weed control and compared to managing weeds via rotations, soil nutrients, and structure, as discussed in previous articles, cultivations can be easily varied to accommodate different crops, and weed problems. A good example comes from a 12ha organic farm in the UK. It was converted from a run down dairy farm straight to intensive vegetables and herbs. The first year saw excellent growth and few weeds, year two saw considerably more weeds and by year three huge amounts of fat hen and red root were swamping most crops and the farm was closed. The new tenant, by changing cultivations from a spading machine which mixed the top 30cm of soil, to deep ripping, no mixing or inverting of the soil and minimal surface cultivation, reversed the situation and within 2 years there minimal numbers of weeds that could be easily controlled by hoeing.

Cultivation on its own however, cannot achieve good weed control. In the example above there was also an almost religious zeal at avoiding weeds going to seed. Cultivation must be used in conjunction with other controls such as rotations, crop choice and hoeing to achieve good control. Cultivations also alter soil properties such as organic matter, structure, and porosity, so while one technique may be optimal for weed control it may have negative effects. For example a full fallow which can significantly reduce weeds also destroys soil

structure and causes considerable loss of soil humus and nitrogen.

Know the Field and its Weeds - Perennials

A knowledge of a field's weed history is essential, and must be coupled with a good understanding of the weeds physiology - how they grow and reproduce. A critical first step is if there are any perennial weeds present. Perennials are particularly difficult to control, especially in crops and to some extent pasture, so it is important to keep on top of them. For the purpose of controlling them via cultivation perennials can be grouped into four types:

- tap roots e.g. dock
- shallow creeping - stem or roots, e.g. couch/twitch
- deep creeping - stem or roots, e.g. Californian thistle
- corms, tubers bulbs etc., e.g. oxalis

The primary approach to controlling perennials with cultivation is to exhaust the plant, by separating the above ground and underground parts and then exhausting the underground reserves. The tap rooted and shallow creeping perennials are generally easier to control while the deep creeping and tuber types are often the most difficult. There are a number of techniques that can be used. Fallowing is where a field is shallow cultivated every time the weeds produce growth above the soil for a whole season. This is often very effective, especially on the shallower and vertical rooting weeds, and also annuals, however it is very hard on the soil, and removes land from production of any kind. It is therefore only used were a serious problem exists. Bastard fallows (for a month or so) can be successfully used where the numbers and vigour of the weeds is lower.

Many tap rooted weeds will be unable to recover if the root is destroyed to a depth of 10cm or more, which can be achieved by deep rotation or using undercutter bars. Ploughing is often not effective as the top part of the stem is not destroyed and although buried they frequently survive.

For shallow creeping weeds it is important that cultivations are only as deep as the creeping roots or stems. Deeper cultivations, especially those that mix or invert the soil such as ploughing will spread the weed deeper into the soil making control more difficult. Useful techniques include spring tined cultivators that bring the weed to the surface to desic-



cate or powered machines such as rotovators that chop the weed up. Repeated treatments will be required as soon as new shoots are produced. Soils and weather conditions should ideally be dry making re-rooting more difficult. Stock can be a valuable help as they often relish the succulent underground parts eating and thus killing them. They should be put onto a field as soon after cultivation as possible.

Deep creeping weeds, especially well established patches, will not be controlled by a short fallow. Control is normally only achieved by a full fallow or a combination of techniques. Sub soiling / deep ripping can be a valuable part of a control strategy, in that it breaks up the underground stems or roots thus forcing them to use up reserves to produce new aerial growth. However if this is not followed by fallowing, hard grazing or mowing then it can exacerbate the problem as the extra top growth will store more reserves. Ploughing rarely has much effect on these weeds as the creeping parts are below plough depth.

Deep rooting weeds underground reserve levels often have a low point at one point in the season - normally sometime between spring and summer. It can be desirable to wait till underground reserves are exhausted before attempting control. Undercutter bars can be valuable in controlling these deeper weeds as it allows the emerging parts to be cut off deeper in the soil than can be achieved with grubbers and rotary hoes, with lower draft and less damage to the soil. While popular in Europe undercutter bars are not readily available in NZ. They consist of a three point linkage tool bar with two strong vertical legs, often subsoiler tines, with a horizontal high tensile steel bar fixed between the bottom of the two vertical legs. This bottom bar is normally triangular in section or angled so that it forces soil to rise over it. If strongly constructed they can be used at considerable depths.

Corm, bulb tuber etc. forming weeds are fortunately a limited problem in commercial situations, however they are often be the most difficult to control. The storage organ can often remain dormant for many years thus surviving fallows. Stock in a rotation can help with some species as they are very palatable. Some have growth patterns where the old storage organ is used up before new ones are made, providing a window when they are more susceptible to control. Persistence and a through understanding

of the individual weeds lifecycle are essential to gain control.

Annuals

Having considered perennials the history of annual weeds in a field needs consideration. This has to be combined with an understanding of the weed's lifecycle and its seed's behaviour. A number of annual weeds have very tough long lived seeds, some can live for more than 40 years. Others last only a year or two. In addition some seeds are innately dormant - they will not germinate for a number of years regardless of conditions, others have enforced dormancy in that they will become dormant if conditions are not correct for germination. Germination is dependant on the correct levels and mixture of moisture, oxygen, carbon dioxide, temperature, and in some weeds the presence or absence of light. The net effects of these behaviours is that seeds often have distinct periods when they will germinate, many only do so in spring or late summer. They will not germinate below certain depths, with smaller seeds only germinating close to the surface, and larger ones from greater depths. The majority of weeds germinate in the top five cm of soil. The specifics of each weed and its seeds need to be ascertained before deciding on the best course of action.

Fields that have had weeds go to seed in the previous few years will need considerably more attention than fields that have been kept clean. Even very low levels of weeds in a field, e.g. less than 1000 fat hen plants / ha, that have seeded can create a considerable weed problem. In 'clean' fields, where there has been no or limited seeding the previous season, inversion or vertical mixing of the soil should be avoided as this will bring up ungerminated seeds. Where moderate levels of seeding have occurred then, turning over or mixing the soil can be useful if in previous years there has been little seeding or those weeds that have seeded have short lived seeds. However this can store problems for later years, and if the weeds do not have innate dormancy it may be more advantageous in the long term to keep the seeds on the surface where they can be encouraged to germinate, and also be destroyed by natural predation before planting the crop.

Where high levels of seeding have occurred, care should be taken about using the ground for crop-



ping, particularly un-competitive crops. Very vigorous crops that can be easily hoed through the whole season, such as potatoes, could be considered, a period of fallow, or better still a series of very quick growing green manures. A return to pasture if the weeds are palatable to stock and will be controlled by grazing or mowing is another choice. If such options are not possible ploughing with complete inversion of the soil will bury seeds beyond germination depth. Old dormant seeds will be exposed, however, these often germinate readily with the introduction of good germinating conditions allowing successful use of stale and false seed beds.

A balance therefore has to be struck between the amount and type of seed on the surface from the previous crop and the amount and type of buried seed.

In regard to existing weeds: I have, on a too many occasions, seen crops planted into existing annual weeds, often after an overwinter fallow's effectiveness has been hampered by soil and weather conditions. The farmer has often believed that control can be achieved later. This is most inadvisable, especially with vegetable crops, and even if there are only low levels of weed it is often very hard to gain control. I would recommend never to sow or plant into existing weeds, regardless of their size or numbers.

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Organic weed Control - Cultivations and seed bed preparation will be continued in the next issue.

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Canterbury Commercial Organics Group - Newsletter

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