

MANAGING WEEDS, PESTS AND INSECTS ON THE BIODYNAMIC FARM

by Cheryl Kemp

Conventional farmers often consider weeds the major hurdle to the conversion to Biodynamic and Organic Agriculture. Over the past 50 years, the use of herbicides has changed the management of farming to the point that many of the old ways of working with weeds and understanding of good management have been lost.

One of the major shocks to Agriculture recently has been the fact that "the use of water soluble fertilisers, herbicides and pesticides have been shown to actually increase weeds!"

This happens because of the loss of soil bio life, loss of healthy bacterial and fungal activity in the soil, loss of soil organic matter and loss of soil structure. Soils have become compacted, thus impervious to oxygen and water – which automatically excludes soil life. One ends up with only a few dominant weeds that can survive the harsh conditions. Sometimes all that remains is moss or algae on the surface – pioneers in plant succession, trying to get some life back there.

How do we change this scenario?

Can farming come to work with weeds and nature in a new way of understanding and management?

WEEDS AS MESSENGERS

Biodynamic, organic and biological agriculture look at weeds as messengers. What message are they giving us and how can we act on the message?

Killing the messenger is not an option! The farmer needs to go back into the history of the area/paddock/land and look at the symptoms presenting and work towards longer-term solutions.

1. Dominant Weeds of one type

Dominant weeds are often signs of an environmental problem, atmospheric imbalance or nutrient deficiency. For example Patterson's Curse and Fireweed is usually a calcium and copper deficiency. Soil tests will often confirm the lack of major elements like calcium, potassium and phosphate or the trace elements of copper etc.

If thistles, wild turnip and wild carrot are in amongst your pasture, look for compaction. These deep rooting weeds with large taproots are trying to break up the soil and let in oxygen and water.

Bindweed shows up where the soil has been cultivated too wet and it has crusted over.

Damp/acidic conditions will show up with buttercups, sorrel and dock, or

waterweeds that can cope with the anaerobic conditions around their roots.

Solutions:

- Have soil tests done and replace major nutrients with natural mineral inputs.

- Use Biodynamic soil and atmospheric preparations to bring balance back into soil life and soil nutrition.

- Over-sow or re-pasture, if necessary.

- The area may need ripping or aerating to open up compaction and bring in oxygen and water.

- Rotational grazing to support variety and allow re-growth of all species.

2. Some weeds or herbs are Mineral Accumulators:

Often, weeds are seen as a problem rather than beneficial to the land. Many weeds and herbs are known to be mineral accumulators and are very important to the ongoing health of the soil. These weeds and herbs often grow naturally in an area as they are able to bring in the missing nutrients for that area.

Examples are:- Tobacco Bush, Privet, Blackberries, Phytolacca (Ink Weed), Lantana. (The legalities around noxious weeds need to be recognised, but the message can still be worked with.) Many of these live happily at the edge of forest areas that have been cleared. This is because in our phosphate poor soils, these plants are able to bring in (accumulate) phosphorus from the atmosphere. They also attract bird life (bird droppings are

high in phosphorus) with their berries.

Solutions:

- Make a Biodynamic weed tea ferment by placing the weeds in a 200 litre drum, filling with water, adding a set of Biodynamic Compost Preparations (502-507) and stir daily as you leave it to ferment for 8-10 weeks. Once fermented, drench the land at 40 litres weed tea in sufficient water/ha. This eliminates the need for the weed to be there and balances out local trace element deficiencies.

- Some of these weeds/herbs are also great green matter for your compost heaps. So remember to appreciate the great job these weeds/herbs are doing.

3. Weeds that cover bare land

If land is left uncovered due to land clearing or drought, certain weed species will rush in to cover the land. If it has had bush cleared then you will attract the phosphorus type plants (as above). If it was pasture denuded, then whatever is in the seed bank and suitable for the climate at that particular stage will grow. You often see broadleaf weeds with spreading root surfaces grow here so that as much soil as possible can be covered at once.

Solutions:

The first question you must ask yourself is what are you going to cover the land with instead?

- Is it possible to re-pasture or mulch mow and add grass seed to increase species and change of species?



Rotational Cropping & Building Soils – Adam Collins mulch mowing a corn paddock prior to lightly discing with Manure Concentrate (CPP) application in readiness for Lupin and Vetch green manure crop.

- If the weeds e.g. blackberries, gorse or lantana are on steep or inaccessible hillsides then often the only way out is to clear some smaller areas and plant tree species that will eventually grow to shade out the areas.

- Clearing and pulling roots out, then Peppering (see side box) to stop new growth and replanting, and covering the soil is another solution. The Peppering in this instance does not stop or kill the woody plants, but it ensures that future seeds are infertile.

4. Cropping weeds

This is a big subject, where we are just starting to experiment. Specific weeds come up for specific crops. For example Apple of Peru (*Nicandra physalodes*), Thornapple (*Datura Stramonium*) and Redroot (*amaranthus*) like areas where the soils have been loosened and mounded. Their purpose is to hold the soils together and shade the young crop!

Solutions:

- Cultivation, cultivation, cultivation!! Timing, use of spring tine harrows, finger weeders, push hoes (for smaller areas).

- Mulching, covering the ground, turning in a green manure crop prior to planting to clear some of the seed bank out.

- No-Till: grow a tall green manure crop such as forage sorghum and roll it over to lie flat on the ground. Go through with a coultter to plant seedlings into ground cover.

- Under-sowing: grow a low growing ground cover type crop or plant, such as Purslane in potatoes to keep areas between crops covered, or pasture grasses that will come up after the crop overhead is harvested and become part of the rotational grazing program.

- Double cropping: e.g. soybeans or clover between the rows.

- Peppering: collecting weed seed heads from last crop, burning to ash and putting out the ash as the next crop is planted.

INSECT AND DISEASE MANAGEMENT

The appearance of insects attacking plants on horticultural crops is a sign of imbalance. Insects can tell if a plant is under stress and that is why sudden attack is a sign from your crop that all is not well.

Using insecticides whether organic or conventional is only killing the messenger again. In Biodynamics, the Horn Silica Preparation 501 is excellent at bringing the atmospheric aspect into balance and keeping the plant's sugar saps up (high Brix).

Moulds, mildews and fungal disease often occur when the earth and atmosphere is moist and warm. Rudolf Steiner, initiator of Biodynamics often spoke of the boundary of the top of the soil moving up into the plant as the soil becomes over-permeated with too much moon (water) forces. This often occurs at Full Moon and when the Moon is close to the earth (Perigee). When this happens

the soil life also moves up into the plant thinking they are still in the soil, leading to mildew and fungal diseases.

Horn Silica Preparation 501 and Equisetum 508 brings the balance of water in the atmosphere and helps push back those too strong moon forces, into the soil. Regularly applying Biodynamic Preparations as a precautionary pre-planting program in Spring and early Summer also strengthens the plants and keeps sugar sap levels up.

The importance of Horn Silica Preparation 501

In the Spring issue (Volume 20 No. 3) we spoke of the role of Horn Silica Preparation 501 in increasing photosynthesis and the sugar sap levels going to the plant roots as exudates, thus increasing the nutrients to attract the beneficial bacteria and fungi in the soil micro-life leading to better growth forces to the plant.

Biodynamic Grape growers using the Horn Silica Preparation 501 have noticed that the skin on their grapes is stronger, the peduncle is woodier and thicker, and even the leaves more robust, and thus have more resistance to fungal, insect attack and splitting. Spraying the Biodynamic Sprays such as Seaweed brew and Fish Emulsion or Biodynamic Compost Teas has also shown to keep the beneficial dominant fungi and bacteria coating the leaves and fruit well to keep out the non-beneficials!

The speed at which the Horn Silica Preparation 501 can turn things around is quite dramatic. Recently, I had a call from a wheat farmer to say that Red Legged Earth Mite was attacking his young shoots of wheat – as they usually did at this stage of the crop. I checked when he had last used 501 and he replied "not yet". I suggested he go out next morning, early, and spray the crop area, a light mist into the air at sunrise – even just going around the boundary of the wheat crop.

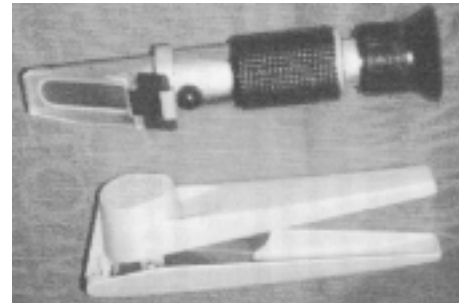
He rang later to say that the Red Legged Earth Mite was leaving the crop – running in confused circles and moving out! He had balanced the atmosphere and also lifted the sugar sap levels of the wheat shoots.

The next crop he put out the Biodynamic Soil sprays (Horn Manure Preparation 500, Manure Concentrate - CPP, Horn Clay and Fermented 508) and the Atmospheric sprays (Horn Silica Preparation 501 and Fresh Equisetum or Casuarina 508) prior to planting and four-leaf stage, saving insect attack.

Sugar Sap levels as an Indicator of Health

The best way to check sugar sap levels is through taste. Check some of your pasture grasses to see if they taste sweet and flavourful – they will also be to your stock.

Testing Brix levels - lifting to over 12 is a sign that all is well. Using all the Biodynamic Preparations also ensures the



Brix Refractometer for checking sugar sap levels.

presence of complex long chain sugars, which are also helping the plant to optimum health. (See side box for short and long chain sugars).

PEST MANAGEMENT SOLUTIONS

Buffalo Fly

Rotational grazing, keeping ahead of the cycles, ensuring there are Dung beetles to eat the fly larvae in the dung, and healthy soils and animals all help here. But whilst getting to that stage of balance, peppered Buffalo Fly ash – preferably potentised to 8x in the drinking water troughs can have a good effect. Seaweed, either as a liquid Biodynamic brew or powdered and added to their water or mineral licks also supports the animals in this summer stress.

Monolyptas Beetle

Monolyptas fly when the new leaves and flowers are out and can strip trees of all their new growth. A Biodynamic Tropical Fruit grower, Gordon Northam, of Sandy Beach, North of Coffs Harbour has had great success in overcoming his Monolyptas problem.

When they came in and totally buzzed his trees, he placed plastic sheeting under a tree, hit it a few times and then collected all the beetles below. He then blended them in the blender with water and diluted 1:10 and sprayed back on. The result: no Monolyptas. They have also kept away this year as well.

Gordon left two macadamias unsprayed so he can collect more beetles, if he needs the spray again. They were just about stripped, but none of the other trees were touched!

Dealing with Birds and Animal pests

Raiders of the crops! In the long-term landholders need to look at the biodiversity and predator cropping, as detailed below. Meanwhile, many producers have found peppering of the problem bird (e.g. starlings in grapes, 28's (a parrot), cockatoos and bowerbirds) or animal (wombats, roos, rats, snakes, fruit bats) to be of fantastic help.

Biodynamic Olive and Grape Grower, Jude Gauntlett of Nerrabup, WA, confirms that they have been having marvellous results with Biodynamic Peppering against parrots.

"Last year we picked not an olive from 19 trees," states Jude. "This year we have no parrots and loads of olives – only



John Priestly mulch mowing Caloona Peas in his citrus orchard.

variation, Biodynamic Peppers. It is really dramatic.

"My neighbour, also a grape-grower, is becoming quite interested in my 'black magic' even to putting out an odd Biodynamic 508 (*Equisetum/Casuarina*) spray from some of my leftovers."

Biodynamic Banana Farmers, Greg Holmes and Susan Foster of Nambucca Valley, NSW, also found a combination of peppering and biodiversity management was their solution to an outbreak of Black Rats (*Rattus rattus*) attacking their horticultural crops.

"I basically add the ground rat pepper ash to 60 litres of water in my flowform, stir for an hour, and using water as the carrier, fill it into my backpack and spray it over the land, making sure I cover the boundaries of my banana plantation," advised Greg.

"I also cleared any areas where I could see nests, for example in banks and under stones, etc.

"Added to this we encouraged predatory birds into the patch by putting up several owl posts, and sure enough we have a pair of Tawny frogmouths in the patch. After 3 months or so, we are now enjoy very minimal problems from rat damage.

"It did take some time and diligence to begin with, but now we have enough ash to enable us to spray each year to keep things in balance," says Greg.

Biodiversity,

Predator Crops & Natural Bush

According to John Priestley, one of Biodynamic AgriCulture Australia's experienced Biodynamic farmers, every farmer should have a book on local birds and binoculars.

John has found that specific birds will eat problem pests. For example, the Black Faced Cuckoo Shrike (commonly known as a Blue Jay) will eat the Bronze Orange Fruit Bugs (*Musgraveia sulciventris*) on his 6000 tree citrus grove. The lizards and goannas eat the snails (place long agricultural tubing under some trees to

give them a hiding place).

Keeping natural areas around and amongst your farm, timing border crops to fruit when your crop fruits and feeding the birds instead of them having to eat your crops are other ways of keeping the natural balance on farm.

Ensuring the Overall Health of your Farm

As you convert your farm to Biodynamics, the things that initially seemed to be a great challenge will become easier. As the overall farm health and vitality improves, weeds and pests will pose less of a problem. Summarised below are my Biodynamic recommendations in helping ensure the health and vitality of your farm.

- Have soil tests done to check cal:mag ratio. Identify if there are any major element problems. (Albrecht tests done through Brookside Labs (Nutri-Tech Solutions), Perry Labs, SA, and Swep VIC. Use small amounts of major nutrients as suggested. Trace elements can usually be brought up to speed with the use of Biodynamic preparations, via composting and liquid brews and the soil and atmospheric sprays;

- Apply Basalt rock dusts to enhance minerals, paramagnetism and growth;

- Use Rock phosphate if your phosphates are low, the increased soil bio life will help incorporate the hard rock phosphate;

- Spray out the Biodynamic soil and atmospheric sprays at least 4 times per year, monthly if on poor soils or getting started quickly. These will rapidly increase your soil bacteria, fungi and micro-life and build soil humus. (Refer Summer Issue - Volume 20 No. 4);

- Make good Biodynamic compost kept as static piles with the Biodynamic compost preparations. Use at the rate of 2 tonnes per Ha. It is the very best way to develop total soil health, paramagnetism, organic matter and balance on your farm;

- Use green manure crops in cropping rotations to build organic matter and

overcome weeds and help supply part of the nutrient supplies for the soil bacteria and fungi;

- Hone your observation skills, get to know the local habitat, vegetation and fauna and develop natural areas around and amongst your farm that help keep the natural balance;

We then get to eat the best tasting, highly nutritious food and become totally healthy just like your farm!! ■

What is Peppering?

Peppering is one method that Biodynamic farmers and gardeners use to make a specific area feel the wrong vibration/anti fertility for certain weed, animal or insect. It does not kill them; they just will not go there. In the case of seeds, future seeds are infertile.

The method entails taking the seed part of the plant or the whole animal, skin, feathers or insect and putting it through fire (opposite of fertility) at the time of highest fertility in the Moons' cycle. Then spread the ashes or potentised ashes in or around a boundary of the area where the weed, animal or insect is a problem. You will need to have access to the Biodynamic Antipodean Astro Calendar (available through the Biodynamic Association) to get the right times and for more detailed instructions. Some practitioners sell readymade Potentised Peppers.

Introductory Biodynamic workshops are run across regional Australia and members of the association can access ready made biodynamic preparations and a phone advisory service. Details can be obtained from www.biodynamics.net.au or by contacting 02 6655 0566 or email: cheryl@biodynamics.net.au

Short and Long Chain Sugars

"When the primary structure of the plant is based on short chains of sugars and amino acids, you have weakened plants that attract insects because of the energy radiating from them. The longer the chain of amino acids, the more energy there is and the longer the chain of polysaccharides, the greater the energy. There is also a physical resistance associated with long chains ... making them stronger and woodier, which makes it hard for the insect's proboscis to penetrate tissues. Simple sugars and amino acids cannot provide this protective barrier. Materials like soft rock phosphate, kelp, fish and biodynamic preparations can help create the long chains we are seeking."

From Interview with Dr. Dan Skow, Nutrition Rules! Graeme Sait, published by Soil Therapy Pty Ltd.