

Canterbury Organic 'Weed Control Workshop'

November 2007

Location: Neville and Sue Sinclairs - 'Scargill', North Canterbury.

Presenters: Gilda Otway (Part One) and Neville & Sue Sinclair (Part Two)

Part One – by Gilda Otway

1. What is a weed?

Plants that are not wanted, for example self sown lettuce seedlings amongst carrots.

A farm is an 'ecosystem'. It involves continuous balancing of many integrated parts, similar to a natural ecosystem (a basic principle of permaculture). Effective weed control requires understanding weed lifecycles, growth habits and the short and long term implications of method (s) chosen. All farms will have their own combination of weeds.

2. Impact of Weeds:

- Weeds influence their environment (soils, water, nutrients, light ...) and will compete with other plants.
- Can cause illness to stock and humans (nettle, ngaiho, hemlock)
- Can contaminate harvested crops (unripe nightshade berries and peas)

3. Lifecycles:

Annuals

Features - complete its lifecycles within one year.

- high amounts of hardy seed to enable survival of harsh seasons.
- grow fast.
- management is easier compared to perennials.

Examples – barley grass, bitter cress, black nightshade, cleavers, fleabane, milkweed, nettle, shepherds purse, willow weed, vetches.

Ephemerals

Features - grow more than once per season, (repeated lifecycles within a season).

- very fast dominating growth enables strong competition with other plants.

Examples – chickweed, fathen, fumitory, groundsel, spurry.

Biennials

Features - establish vegetatively in the first year and produce seed in the second.

- some can survive longer if kept vegetative, by mowing.

Examples – hemlock, foxglove, nodding and scotch thistle, moth mullein, storksbill.

Perennials

Features - live for more than one year.

- Have mechanisms for surviving harsh conditions, for example underground storage organs, can lose leaves, thick leathery leaves.

Examples – buttercup, daisy, dichondra, dock, kikuyu grass, yarrow, mallow, oxalis, plantain, California thistle, twitch.

4. Propagation:

Understanding how weeds propagate gives the grower more information to choose effective and appropriate weed control methods. Common examples include:

Seed (gorse, shepherds purse).- Cut weeds before seed is set.

Rhizomes (twitch, yarrow, bindweed). - Continual digging up of growing points until none are left, may take several years.

Runners (buttercup). - Similar to rhizomes.

Taproot (docks, dandelion, fennel, plantain). - Growing points are usually near the soil surface, hence try to remove about 5cm.

Bulbs (oxalis).- Dig out to remove 'base plate' (reduced stem) to ensure that more bulblets are not produced.

5. Growing conditions:

Weeds have preferred growing conditions of light, warmth, moisture and day length. For example fumitory and plantain prefer spring and early summer conditions, shepherds purse prefers spring and autumn (damper conditions).

6. What they can tell us:

References described below can give growers a lot of useful information for determining why the weeds are growing. For example the soil may be quite wet, acidic or compacted.

Useful references:

Weeds, Control Without Poisons by Charles Walters. This book identifies specific nutrient and structural soil conditions relating to specific weeds. For example sterile and compacted soil conditions help twitch grow more vigorously.

Weeds and What They Tell Us by Ehrenfried Pfeiffer places weeds into family groups, which often have similar growing requirements and growth habits.

Three main categories are outlined as follows:

Acid conditions – sorrel, dock, bracken, daisy, plantain, sow thistle. Could be due to incorrect pH or aeration problems.

Surface capping and/or hard pans – mustard, twitch, convolvulus. Could be due to over cultivation or when too wet.

Following cultivation/soil disturbance – fathen, plantain, chickweed, mallow.

Biology of Weeds by Thomas Hill has a good section on soil indicators. Examples include:

Acidic – refer examples above

Alkaline or chalky soils – scarlet pimpernel

Poorly aerated soils – buttercup, dandelion, dock.

7. Benefits of Weeds:

- Tap nutrients for later use by crops when they decompose - dock.
- Indicate soil condition
- Useful addition for compost and mulch - chickweed, buttercup leaves, dock leaves
- Benefits for stock health - plantain.
- Food source – chickweed, young dandelion leaves, nettle.
- Protect soil surface
- Can add biomass and nutrients
- Break up hard pans and open soil to assist drainage – dock
- Attract beneficial insects – yarrow

8. Noxious Weeds

It is important that land owners are familiar with the weed status of plants on their property and take necessary action for control.

Weed Status in Canterbury, New Zealand

http://www.ccc.govt.nz/parks/TheEnvironment/weedguide_status.asp).

The Biosecurity Act enables Environment Canterbury to eradicate or manage plant (and animal) pests.

The categories of plant pest used are:

Total control plant pest

A high level of control that aims to eradicate the plant from the region. Species that have been declared "total control plant pests" can not be sold, propagated or distributed.

Progressive control plant pest

Staged control is aimed at eventual eradication through reduction of propagule sources. Species that have been declared "progressive control plant pests" can not be sold, propagated or distributed.

Containment control plant pest

Control is aimed at ensuring that the species does not spread in range. Species that have been declared "containment control plant pests" can not be sold, propagated or distributed.

Surveillance plant pest

No control of existing plants is required, however sale, propagation or distribution of these species is prohibited.

Unwanted organisms

Species that have been declared "unwanted organisms" can not be sold, propagated or distributed. A Regional Council can also spend money on their control if eradication is feasible.

9. Management options for control of weeds – comments by author regarding application on own property are in italics.

Prevention:

- Use clean material. *Pea straw, wood chips, cow or sheep manure.*
- Prevent seeding. *Mowing, weed eating, stock.*
- Time the planting of your crop to become established before the weeds, inhibit weeds with a specific crop rotation, such as planting mustard, buckwheat, or peas in spring to cover the ground quickly. *Mustard and lupins have been highly successful in all seasons except coldest months.*
- Living mulches – red clover under corn, tall beans and tomatoes, melons and corn, kumara and corn, white clover and vetch are tolerant of foot traffic in alleys of row crops. *Red clover in alleys between berries.*
- Living barriers – *comfrey planted beside raspberries prevents twitch growing in and slows up berries spreading.*
- Physical barriers – *use of rocks, ground durable timber.*
- Spacing – increase sowing rate to out compete weeds.
- Water – drip or ooze irrigation on selected crops rather than sprinklers. *Essential for water conservation also and ease of use in tree crops and vegetable growing.*
- Composting – hot compost at 60 deg cel for several days to kill seeds.

- *Separate useful mulch weeds from those likely to reproduce when hand weeding. Leave out to cook in sun weeds such as twitch, corn bind, convolvulus, and then burn or discard safely.*

Cultivation:

Carry out when soil is relatively dry. Weeds are cut or uprooted, examples include tractor mounted brush weeders, spring tines, ploughs and various hand tools. *Care with hand weeding or cultivation around shallow rooted perennial crops such as blueberries or young hazels.*

Animals:

Ducks and geese in orchards. *Have good fences especially with sheep, cows and chickens.*

Mowing:

To prevent seeding.

Mulch:

Needs to be dense and thick enough to prevent or slow up weed growth. Evaluate materials that are cost effective. *Side delivery mower in orchard to cut and spread herbal ley mulch under trees. Cardboard and sawdust for pathways, cardboard and wood chips or pea straw under smaller perennial crops such as feijoas.*

Biological control:

Use of living organisms to control or reduce numbers of another organism. For example ragwort seed fly for ragwort. Check with local regional council pest control officers for what has worked in your area.

Biodynamic peppering

Requires specific techniques and best to discuss with Biodynamic Association to accurate information.

Heat:

Flame weeders, steam weeders, black or clear plastic. *Plastic used to kill via solarisation effect pre planting.*

Herbicides:

Interceptor (now called Bioweed Control) is the only Bio-Gro acceptable one available. *It has a burning off effective so is best on small weeds that propagate by seed but before they have set seed. Some effectiveness on hazelnut suckers.*

Part Two –by Neville & Sue Sinclair

1. Brief History of Property:

The property originally was 4.5 ha in size and consisted of one large Lucerne paddock. The purity of the pasture was maintained by conventional means, i.e. use of herbicides to combat weeds. This regime was stopped 28 years ago. Consequently there was a huge influx of weeds; barley grass, cranesbill, sterile brome, dandelion. These weeds grow rampantly early spring when the Lucerne is still just coming away. The seeds of the barley grass and sterile brome became an unpleasant difficulty for the sheep, getting in their wool and pelts. A huge increase in biodiversity, partly through our own doing with planting and partly a process that occurs naturally.

Main focus of property is self-sufficiency, and inspired by permaculture ideas, organic ideas and some influence from our neighbour who farms biodynamically. Sustainability is a new catch word but it is how we try to live. The property is off the grid. Self sufficient in many foods for example a large vegetable garden, potatoes for the year, orchard, bees, milking cow, beef cows sheep, hens. Our main gap is in grains/flours.

To produce our food and to work our farm and garden even on a small scale requires constant assessment of the soil, the crops and the interlopers-the weeds.

2. What is a weed?

The answer might not be as clear cut as what we think. Prairie Grass in the garden is a weed. But in the pasture?

The definition of a weed is dependant on context and upon one's outlook on life.

Fundamentally weeds are survivors. They are plants with ability to do well in often trying circumstances. They are frequently plants that are early seeding another factor that adds to their success as they mature quickly.

3. Positive aspects of weeds.

Harvesting for compost. Weeds can be destined for the compost bin or rotted in mulch like rows in the garden. Every year there is a forest of hemlock, nettle, mellow and fennel around the chook house. This is scythed down and added to compost piles and heats up well because of the bulky luxuriant growth.

Each year as the season winds to an end and my gardening enthusiasm wanes from its springtime high, more and more of the garden becomes populated with weeds as they assert their right to space amongst aging tomato plants and bleaching corn stems.

In spring the luxuriant prairie grass that has colonized parts of the garden is cut each morning as a treat for the cow while I milk her.

These weeds that have populated the garden will have protected the garden soil from the heavy impact of winter rains, leaching and ultra violet light. This is good for the soil structure and nutrient levels and the soil's micro-inhabitants.

In a pasture situation weeds can contribute to increased stock health by providing a more diverse diet. Weeds with roots of varying depth gain access to diverse minerals and water.

Our pasture contains weeds that a fastidious conventional farmer might wish to eradicate.

Often this impulse stems from a misguided sense of aesthetics than from recognition of the weeds negative aspects. We deliberately sowed Plantain seed years before it was promoted as an innovative new cultivar (and got it free! From the very same company that went on to develop it as a commercial strain).

Beneficial insects can be lured to the garden and pasture by the presence of flowering weeds, egg; Wild parsnips and fennel draw the parasitic wasps, leaving some nodding thistles means there is a resource for the nodding thistle weevil and also leaves the flowers for the bees.

Various weeds provide nectar for bees during shortfalls, egg broom, horehound, dandelion, cape weed.

Sometimes you curse the weeds knowing how much energy it takes to keep them under control but sometimes I am delighted by the weeds in our vegetable garden. Self sown parsnips, self sown potatoes, self sown coriander, self sown lettuces. These plants appear with no energy input. Potatoes from last years harvest will crowd out new seedlings so they need to be eaten while young and delicious.

These weed/self sown plants are early reacting to soil temps, moisture, day length. Although preventing seeding is a good management tool for weeds and important, but occasionally allowing some plants to seed at the risk of them becoming a nuisance has its benefits.

Medicinal weed plants: Mullein used as tea for chesty coughs and also steeped in oil and applied externally on Hemorrhoids. Horehound used for tickly, dry coughs. Stinging nettle as a hair tonic. Rub dock on nettle stings. If we need to use comfrey as a wound dressing poultice or for a cracked or broken bone we dig up the ones that are encroaching and becoming a nuisance in the garden

Biodiversity; nature tends towards a wide array of plants within an ecosystem.

Looking at weeds on their own gives only part of the picture. Their influence is tied in with our own interventions- cropping, gardening, cultivating and animals.

4. Negative aspects of weeds.

Weeds are primarily a waste of space. Some weeds such as mullein, not only occupy their share of space but gratuitously spread their leaves smothering their neighbours. Weeds compete for moisture, weeds compete for nutrients, and weeds compete for light. Twitch actually damages root crops by growing right through them. Some weeds such as ragwort and hemlock can have a negative impact on stock health. Some weeds also cause physical discomfort, plants such as thistles and nettles.

5. Our main weeds.

Mullein, horehound, hemlock and broom all in the pasture situation. In the garden, there is twitch, spurge in the glass house is a host for white fly, fathen, nightshade, sowthistle.

6. Weed management.

Manual cultivation. A display of tools included hand grubbers, dutch hoes, weed eater, 2 handmade sickle like grass slashers, scrub cutter, springtine grubbers.

Mulching, has a positive add on of moisture retention, but the negative aspect is that the mulch will keep soil temperatures low for longer into the spring and it is also a slug hideout!

We have used fire on Broom but it is not a good idea as it stimulated seed germination.

Peppering, a biodynamic technique and used on Barley grass successfully and also on broom with less success. Need to find a biodynamic publication to get details of practice.

Ducks and Geese in the orchard. Geese make a lot of poo! Ducks love your lettuce patch if they find it!

Large scale cultivation; Springtine grubbers have been used for this purpose up until today when I acquired my new set of red discs!

To combat broom which is a major problem, we use a petrol powered scrub cutter with a circular saw blade.
