AS 90160 Describe the environmental impact of primary production management

Version 2 | 2 credits | External

Achievement	Achievement with Merit	Achievement with Excellence
Describe the impact of primary production management practices on the environment.	Explain the impact of primary production management practices on the environment.	Explain the impact of primary production management practices on the environment.
		Select and justify solution(s) to an environmental problem caused by primary production management practices.

Explanatory Notes

The impact of primary production management practices could include both positive and/or negative effects on the environment.

Management practices that have a negative impact could include: indiscriminate fertiliser application, over-cultivation, indiscriminate chemical spray use, and indiscriminate disposal of animal manures. *Negative impacts* could include: pollution of air, soil or water, and soil erosion.

Management practices that have a positive impact could include: biological control of pests and diseases, crop rotations, treatment and recycling of effluent, and use of compost material. *Positive impacts* could include: reduced chemicals in the environment, soil stability, nutrient recycling, and improved water quality.

Describe questions will focus on 'what' aspects and *Explain* questions will focus on 'why' and/or 'how' aspects.

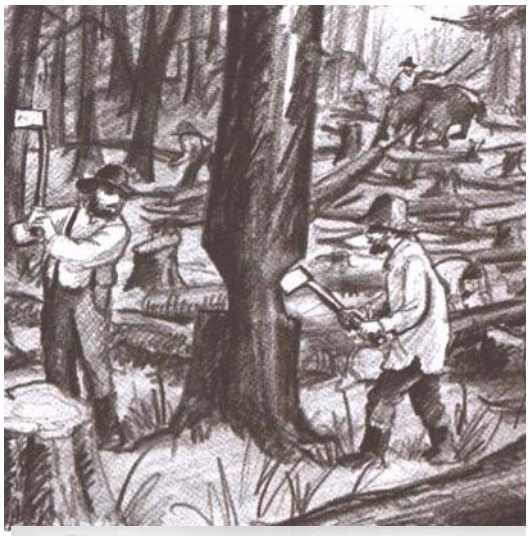
Specific Learning Outcomes		I have learnt about
Management Practices that have a negative impact • Indiscriminate fertiliser application • Over cultivation • Indiscriminate chemical spray use • Indiscriminate disposal of animal manures		
Negative impacts • Air pollution • Water pollution • Soil pollution • Soil erosion		
Management practices that have a positive impact • Biological control of pests and diseases • Corp rotations • Treatment and recycling of effluent • Composting		
Positive impacts • Reduced chemicals in the environment • Soil stability • Nutrient recycling • Improved water quality		

AgHort and the Environment:

Since the arrival of people in NZ, the landscape is constantly being changed.

- Removal of native forests

Felling burning



- Drainage of swamps and wetlands.
- Reclaiming land: as the sea levels decline, land is turned into productive farm land (e.g. as you go into Nelson, most of the land to the Church steps is reclaimed land, Trafalgar park use to be under water)
- Erosion: 3 main types: wind, water and gravity. Erosion is due to the removal of ground cover and trees.

- New species being introduced has caused a couple of problems. Reduction in native species of plants, thus a reduction in native birds and wildlife. Introduced plants taking over and becoming a weed problem, e.g. gorse, blackberry, old mans beard, banana passionfruit

Humans have had a huge impact on the environment, most of it negative. For the land to remain productive we need to look after it. We need to be thinking long term (hundreds of years not just 10 years)

Negative impacts on the Environment

Many management practices carried out on agricultural and horticultural properties have negative impacts on the environment. Not all of these impacts can be removed but they can often be reduced by using care, or alternative methods. Care can be taken when using chemicals: correct application, correct timing, reducing amount, different application methods etc.
The most common negative impacts are caused by:

- Indiscriminate fertiliser use
- over-cultivation
- indiscriminate chemical spray use
- and indiscriminate disposal of animal manures.

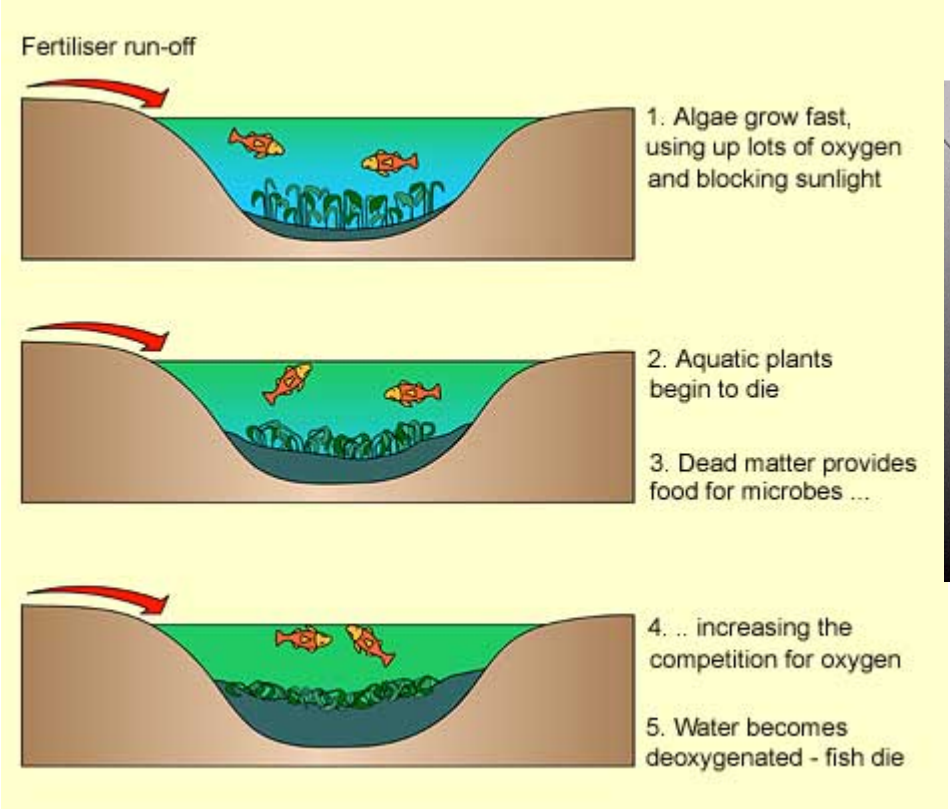
The negative impacts can cause:

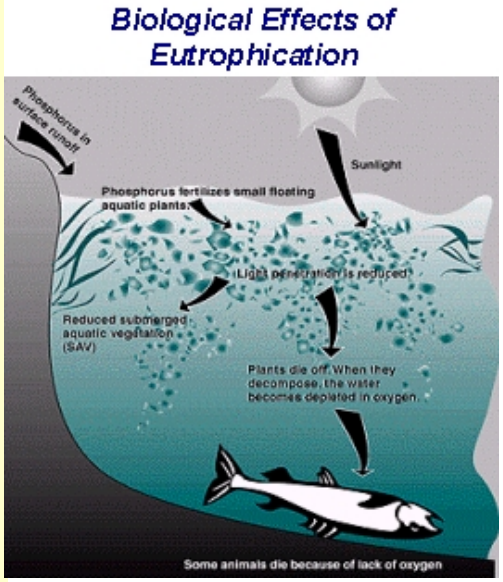
- pollution of air, soil or water,
- and soil erosion.

Indiscriminate Fertiliser Use:

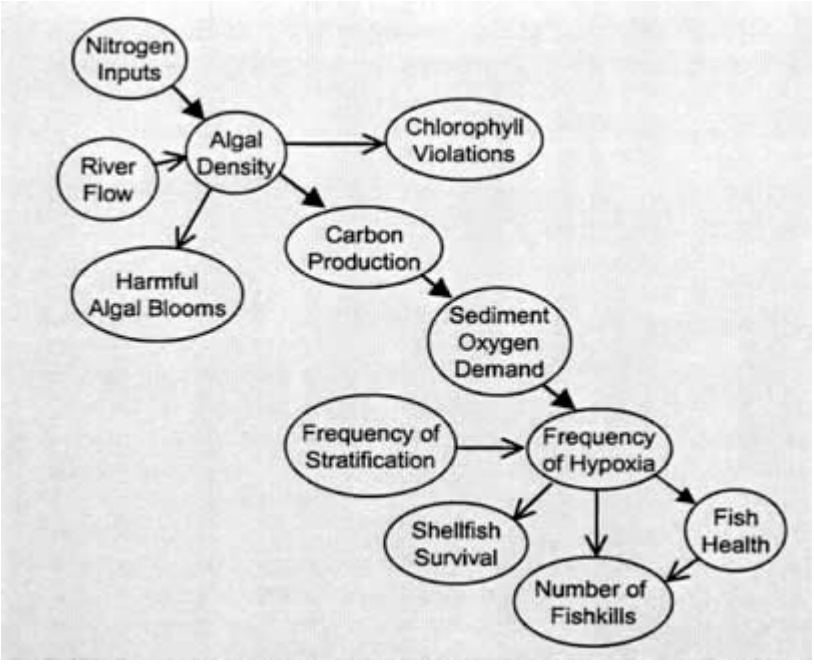
Fertiliser use is very common in primary production units (farms). This is because it is relatively cheap to use and easy to apply.
They can help increase the productivity of the land. BUT when used without thought there are many negatives.

N fertilisers: used to increase leaf growth in pastures. Often applied as urea. If we apply too much, most is washed through the soil profile and ends up in the streams and eventually in the lakes. Eutrophication is the name given to this problem.





Task: add extra notes to the diagram above from the notes on the board.



P fertilisers: the production of these can cause problems in the environment. Superphosphate tends to decrease the pH of soils. This can lead to toxic levels of micronutrients e.g. Fe, Al, Mn

$Ca_3(PO_4)_2 + 2H_2SO_4 \rightarrow Ca(H_2PO_4)_2 + 2\ CaSO_4$

NB: H_2SO_4 is manufactured using S. The S is burnt to produce SO_2. this is a toxic/acidic gas and is the main contributor to acid rain. When SO_2 is mixed with water it forms sulfuric acid (_____).

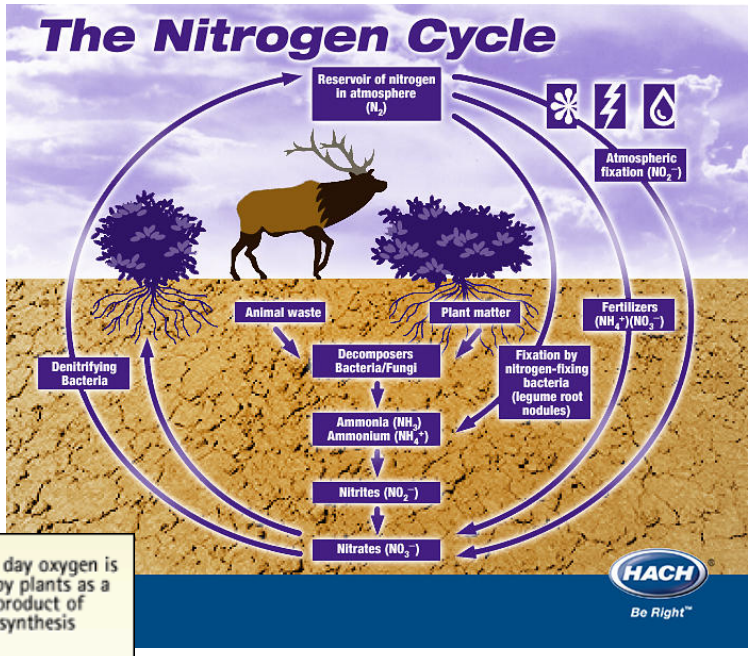
Fertiliser in general pollute waterways by making them undrinkable due to a “bad taste” or toxic levels of undetectable toxic chemicals. The excessive amounts applied to some paddocks leach into underground water supplies, this makes them unsuitable for drinking.
Too much of any nutrient can cause it to become toxic.
Toxic levels mean that plants don’t grow as well, and, animals can get sick. Both of these lead to humans getting sick.
It costs money to put fertilisers into the soil, if a lot of it is wasted.

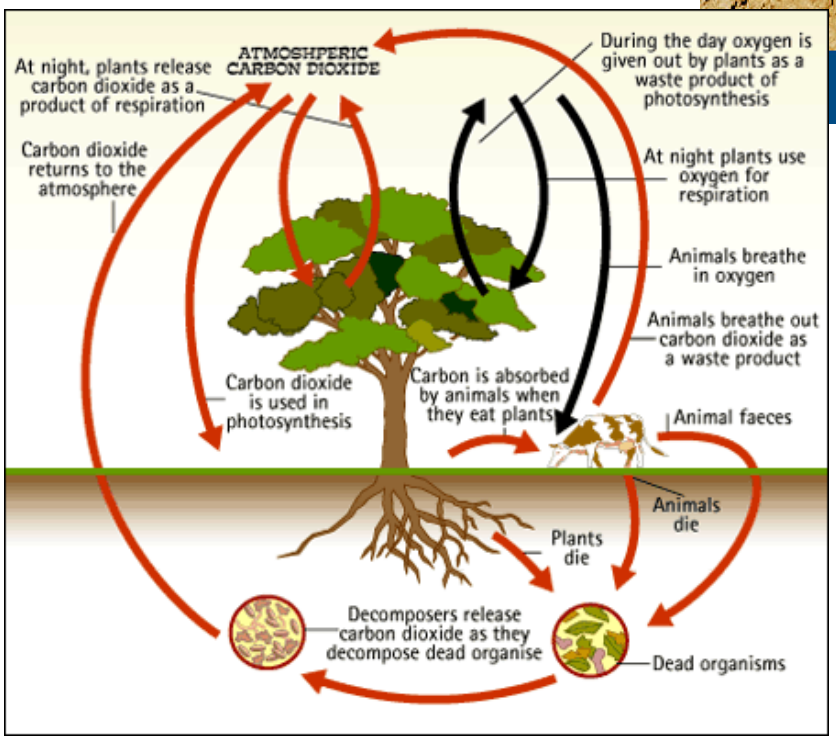
Leaching of nutrients = loss of money = less profit

In nature most nutrients are re-cycled naturally through the decomposition of dead and decaying matter

Outline the role of carbon and nitrogen cycles in agriculture and horticulture:

_____
_____
_____
_____
_____
_____
_____
_____





How does the addition of superphosphate fertiliser affect the carbon cycle?

_____
_____
_____
_____
_____
_____

Impacts of Cultivation:

When cultivation is carried out correctly, it provides a fine tilth for seeds to germinate in. It can also help to mix in green manure crops or compost.
Cultivation causes problems with the soil structure. When over-cultivated, the soil structure is destroyed. This can lead to soil compaction in the topsoil, it may also lead to the formation of a clay pan.
Over-cultivated soil is more prone to erosion. In Blenheim one of the main forms of erosion is wind. The Wither Hills are covered in wind blown soil from the Wairau Plains. Soils formed by wind erosion are called Loess.
If there is not enough ground cover on the Withers' then they are prone to water and gravitational erosion. Tunnel erosion occurs on the Withers'.

Impact of chemical sprays

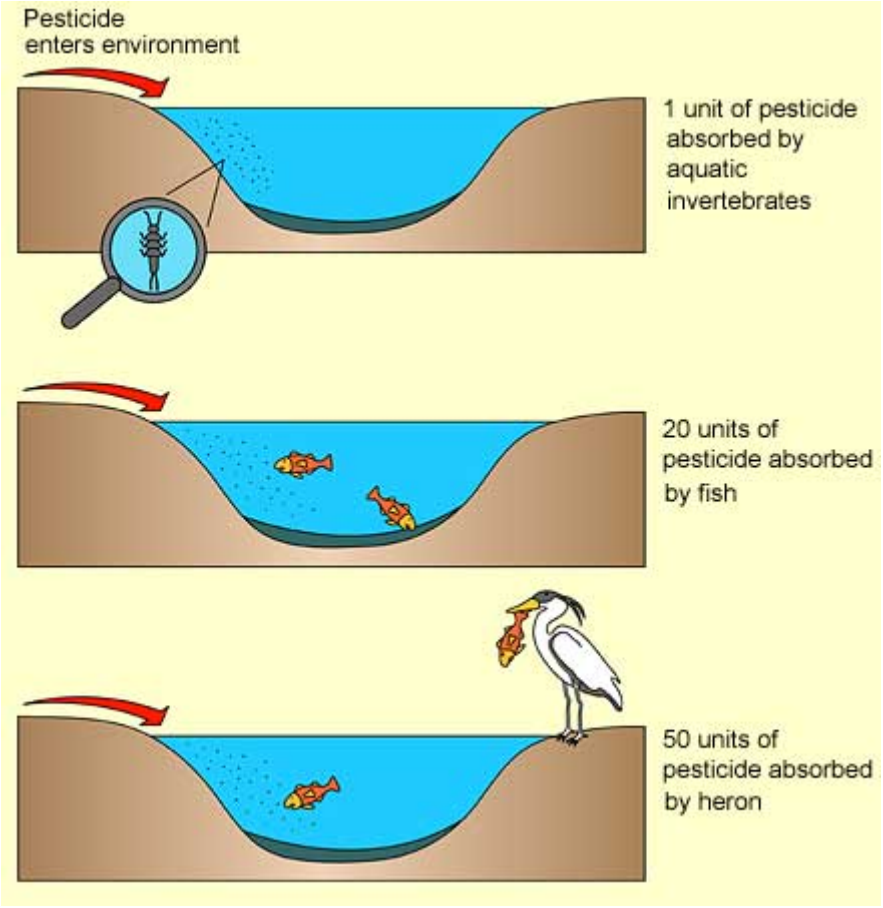
Pesticides and Herbicides:
Many of these chemicals can survive in the soil or on plants and in animals for a long time.
The use of agri-chemicals needs to be timed so it won't interfere with the sale of goods (meat or plant products). Farmers need to take note of the with-holding period for all chemicals they use on the farm.
Farmers shouldn't blanket spray whole paddocks with herbicides. Spot spraying (knapsack) is a better choice. It also uses less spray, thus less money.
With pesticides, the pests can develop resistance. This means stronger pesticides need to be developed and used. Follow the directions, make up the correct concentrations. Most importantly, make sure you have identified the correct pest/weed and are using the correct type of spray.

Indiscriminate spray use can also result in:

- Water pollution: if the stray gets into the ground water, or leaches into streams; spraying alongside streams or rivers can cause the chemicals to end up in the water. Don't spray near waterways.
- Spray drift: this can cause problems with neighbours. Pesticides can drift onto organic properties killing beneficial insects. Herbicides can drift onto plants you don't want to get damaged (killed). Don't spray when windy. Damage is more common with broad spectrum herbicides.

Damage is more common with broad spectrum herbicides. Choose the appropriate type of herbicide for specific weed species.

- Chemical build-up: some chemicals don't break down into less harmful chemicals. When these chemicals build-up they can cause problems such as "toxic sickness", cancers, health problems
- Pesticides can cause problems with killing "good" species of insects. Think of less toxic methods of controlling pest problems. Pesticides don't always kill the pest, they can just make them sick.



Effluent Disposal

Dairy effluent (from the dairy milking shed) needs to be disposed of responsibly.
In the past: dairy farmers were able to dump effluent straight into rivers. This is not allowed today because of:

- Nitrogen compounds causing Eutrophication
- Solids in the river are unattractive
- Makes water undrinkable
- Kills wildlife (e.g. fish)
- Bacterial levels rise and become unsafe.

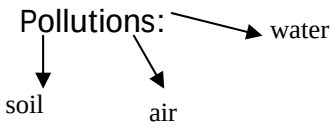
Farmers have several methods available to them to choose from: e.g.:

- Effluent ponds
- Muck spreaders
- Fertigation (liquid part only)
- Irrigating using the shed run off

Water pollution is the biggest negative impact. This is due to effluent/runoff getting into the water supply (underground water, ground water, streams etc)
To avoid this problem farmers need to ensure that effluent is not spread (or stored) near river banks; and that the water table is sufficiently low that the effluent will not pollute it.
The amount of liquid being spread through irrigation (fertigation) can't be too much. The soil needs to be able to cope with the volume of liquid being added. Ie no pools forming. Ponding/pooling or effluent causes soil pores to become clogged. Drainage doesn't occur, the grass dies and bad smells occur. Slime can grow on paddocks.
The irrigation profile can't be too deep. It is not supposed to reach the ground water.
Problems with effluent can also occur when animals go to the "toilet" while standing in a river. This needs to be managed by using riparian strips or building bridges over streams.
Many of these problems are difficult to fix, but they are extremely easy to avoid.

Negative impacts summary:

The main types caused by primary production industries are:



Soil erosion.

Soil pollution is caused by:

_____

Air pollution is caused by:

_____

Water pollution is caused by:

_____

Soil erosion is caused by:

_____

How can we reduce negative impacts in/with:

Soil: _____

_____

_____

Air: _____

_____

_____

Water: _____

_____

_____

Erosion: _____

_____

_____

Problems:

Complete the problems in your own book.

Photograph 1: the water in the stream is covered in green algae

Photograph 2: the structure of the soil is very fine

Question 1
Identify and describe the primary production management practices that could have led to the negative impacts on the environment shown in photographs 1 and 2 above. For each practice, explain its negative impact on the environment
Use the following headings when answering question 1

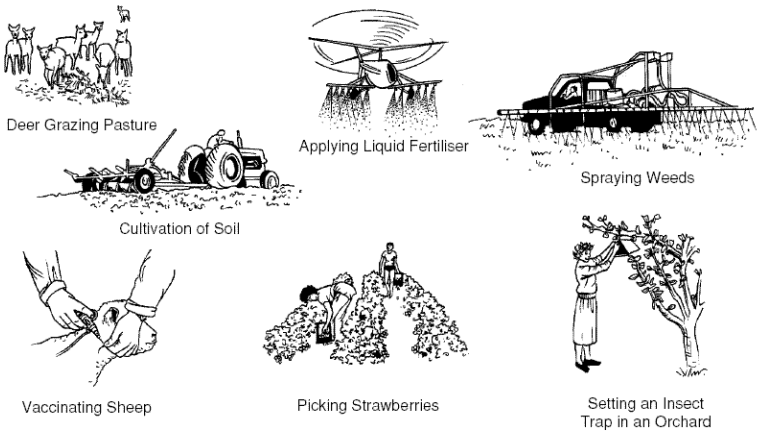
Photograph 1:
Management practice:
Description of management practice:
Impact on the environment:

Photograph 2:
Management practice:
Description of management practice:
Impact on the environment:

Question 2
Describe how the management practices identified in Question One could be changed to reduce the negative impact on the environment shown in photographs 1 and 2. Explain how the change you describe reduces the negative impact on the environment.
Use the following headings when answering question 2

Photograph 1
How the management practice could be changed:
How change reduces negative impact on environment:
Write a description of what you would expect to see now

Photograph 2
How the management practice could be changed:
How change reduces negative impact on environment:
Write a description of what you would expect to see now.



The diagrams to the left show management practices associated with different forms of primary production.

Question 3

Some of the management practices shown above could produce good or harmful effects on the environment.

List **three** management practices that could have a good effect and **three** that could have a harmful effect on the environment in a table like the one below (rule off after you have written in your answer.

Good effects on the environment	Harmful effects on the environment
1	1
2	2
3	3

Question 4:

The diagrams above give no information about conditions or how equipment is being used.

Select one management practice from those shown above that could have a **harmful effect** on the environment.

For this practice, explain the conditions and/or use of equipment that would produce a harmful effect on the environment.

Management practice: ….

Conditions and/or use of equipment that would produce a harmful effect on the environment.

QUESTION 5:

Many primary production management practices can have a negative impact on the environment.
Identify by activity, TWO management practices shown in the photographs **below** that have a **negative** effect on the environment.

For each management practice you identify:

(i) describe the management practice

(ii) explain how the management practice has a **negative** impact on the environment.

Retirement fencing and planting of the riparian margin (river side)

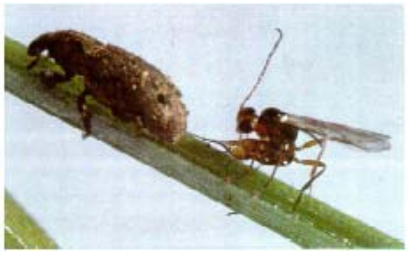
Cultivation

Hedge trimmings drying in preparation for burning

Spraying herbicides and pesticides

Composting

Using one insect to control another



Textbook:

Collect a textbook from the front and do the following:

1. Read pg 12-17
2. Read pg 290-293

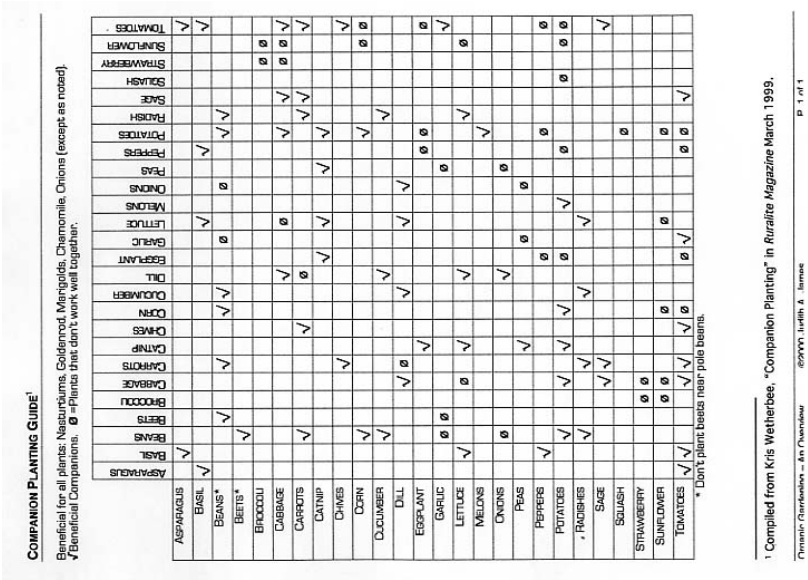
Positive Impact Management Practices

Biological Control

This is an environmentally friendly method of controlling pests and diseases. Some methods are more suitable than others, and some are easier to use than others. Ease of use and suitability needs to be taken into consideration when making decisions.

- **Companion Planting**: Companion planting is a method of growing different plants adjacent to one another for the benefit of one or both of the companions. Some plants are thought to confuse or act as a decoy to potential pests, while a few provide food for the pest's natural predators. Many of the specific plant combinations are based on garden folklore rather than scientific evidence, although many organic (and non-organic) gardeners swear by them. In some gardens the mixing up of flowers and herbs with the vegetables, not only looks good, but also because if there is any chance of confusing the enemy it is worth a shot. There is growing scientific evidence to support certain widely used plant combinations.
  E.g. cabbages with marigolds. Marigolds repel insects as they contain a chemical called pyrethrum. The companion plants can be planted in-between individual plants, or mass planted around the edge of the garden.
  Pests locate their food by sense of smell, so if you can mix up the plants enough to disorientate or confuse, far fewer of your plants will be attacked. For example, the cabbage white butterfly can be fooled into passing by a crop of brassicas simply by planting French marigolds in between the plants, while parsley planted among carrots repels carrot flies. Other plants that produce confusing scents include: rosemary, thyme, sage, lavender, chives, wormwood and garlic.

  To the right is a table showing some companion plants.



COMPANION PLANTING GUIDE[1]

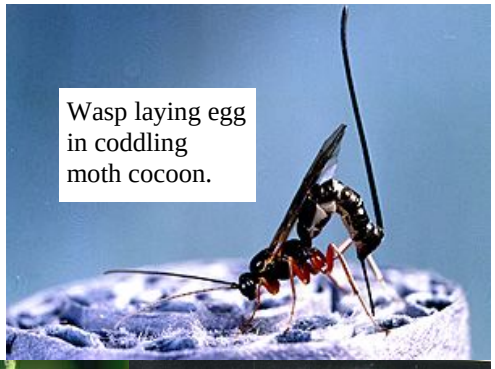
Beneficial for all plants: Nasturtiums, Goldenrod, Marigolds, Chamomile, Onions (except as noted)
√Beneficial Companions. Ø =Plants that don't work well together.

	Asparagus	Basil	Beans*	Beets*	Broccoli	Cabbage	Carrots	Catnip	Chives	Corn	Cucumber	Dill	Eggplant	Garlic	Lettuce	Melons	Onions	Peas	Peppers	Potatoes	Radishes	Sage	Squash	Strawberry	Sunflower	Tomatoes *
Asparagus		√																								
Basil	√		√																	√						√
Beans*		√		√																						
Beets*			√		√																					
Broccoli				√																					Ø	
Cabbage					Ø																				Ø	
Carrots						√																√				√
Catnip							√															√				
Chives								√																		
Corn									√																	
Cucumber										√					Ø										Ø	
Dill											√															
Eggplant												√					√									
Garlic													Ø						Ø							Ø
Lettuce		√				Ø		√				√									√					
Melons																										
Onions			Ø									√						Ø								
Peas							√							Ø												
Peppers		√						√					√							Ø						Ø
Potatoes																					√					
Radishes															√											
Sage																										
Squash																										
Strawberry																										
Sunflower																										
Tomatoes *																										

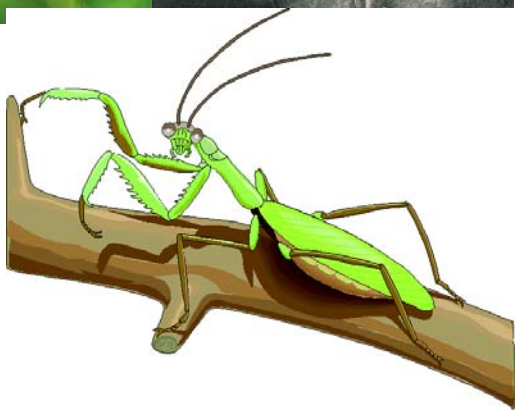
* Don't plant beets near pole beans.

[1] Compiled from Kris Wetherbee, "Companion Planting" in *Ruralite Magazine* March 1999.

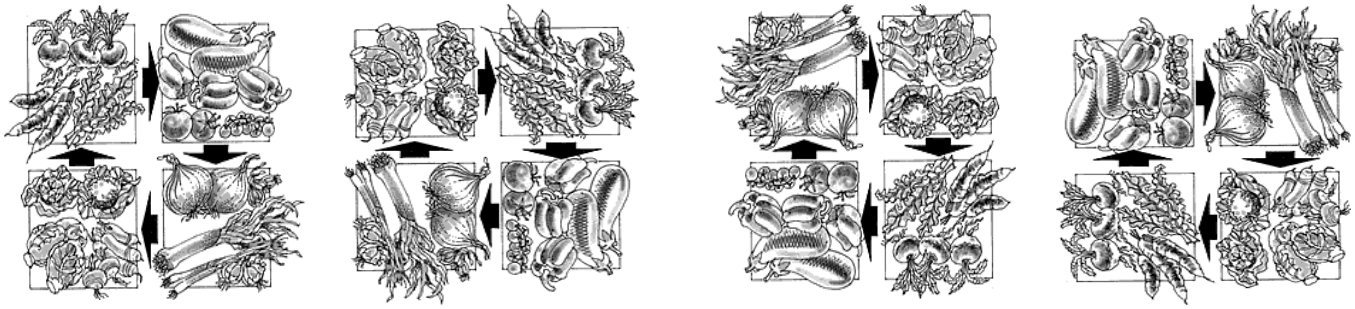
- **Biological enemies**: some insects have natural enemies that eat them. E.g. aphids get eaten by ladybirds and preying mantis. Some insects are controlled by other insects laying eggs inside them (parasites) e.g. wasp. Encouraging the beneficial insects in your garden will aid in the control (but not the eradication) of pests. The use of pesticides kills all insects (beneficial as well). Certain diseases will also aid in the control of larger pests e.g. Myxomatosis in rabbits (the movie Watership Downs was about rabbits running from Myxomatosis) and rabbit calicivirus disease virus (illegally introduced into NZ in 1997). Microbe use (bacteria, viruses and fungi) is common in nature to aid in the control of populations, only the strong survive.


Wasp laying egg in coddling moth cocoon.

- Biological control tend to be species specific, this means they only attack 1 type of pest. This is one of the areas that MAF needs to explore before they allow the release of a new biological control method. They needs to ensure that the new insect (or whatever) that is being released will not harm our native species (especially as many of our natives are endangered) e.g. the *Apantales* wasp lays its eggs inside the white cabbage butterfly caterpillar, the hatched wasp larva eats the caterpillar from the inside, thus the caterpillar dies.



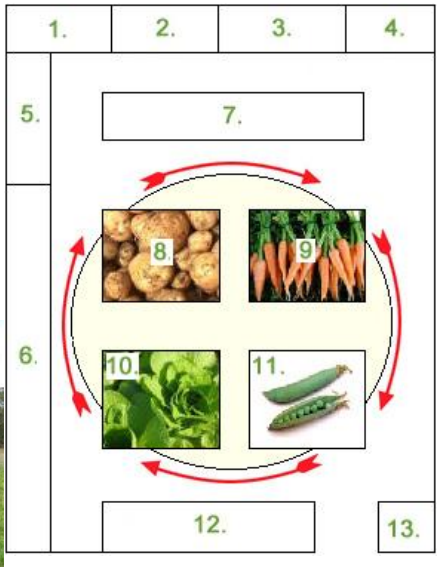
- **Crop rotation:** this is a tried and tested method of helping control diseases and pests in crops.



Year 1 Year 2 Year 3 Year 4

Crop rotation prevents a build-up of pests and diseases. This is because when you plant the same crop in the same area year after year, the pests and diseases that like that crop remain in the soil. After a while they build up to very high levels and the crop becomes severely damaged.

Crop rotation means that it is at least 4 years until the crop returns to the same piece of ground, by that time any disease/pests in the soil have "died" off through lack of "food".



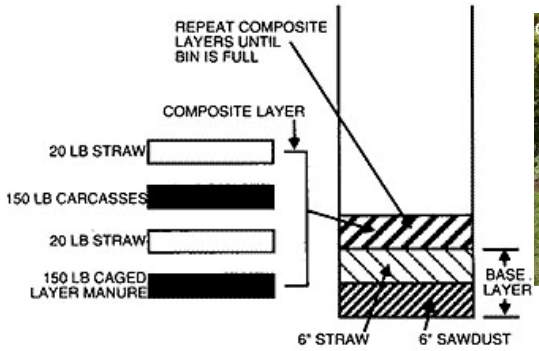
Another benefit of crop rotation is that some crops (e.g. legumes: peas, beans, Lucerne) add nutrients (N) to the soil, thus replacing lost nutrients. The planting of a green manure crop (e.g. oats, ryegrass) can rest the soil and help add organic matter to the soil when it is "ploughed in" to the soil.

Composting: involves using the natural rotting down processes. Composting speeds up the breakdown of organic matter. Good compost is sterile and free of pests, diseases and weed seeds. Commercially produced compost is more sterile than home produced compost because of the temperatures they can reach. The higher the temperatures, the more sterile the compost.

There are many different compost systems available. The simplest is just a pile of organic matter.

One of the better systems is a series of 3 bins. This is because it allows for the turning of the compost, speeding up the breakdown of the organic material. There are some compost bins available that rotate and mix the organic matter, often these take a lot less time and effort than the 3 bin system, but they are expensive and are often more suited to small gardens.

Compost should be done in layers to provide the best mix. This is not always possible and so any composting is better than none.



downsides

It can be expensive to research beneficial insects, scientists need to make sure that they won't damage native species when released.

If not released correctly then they can become a nuisance, or ineffective (RCD) by making the animal sick but not killing it - immunity occurs and the disease is a waste of time.

Using biological control methods doesn't kill all of the pest/disease. This is because if the predators ate all of their food they themselves would die. BUT they do decrease the numbers to a point that the plant can cope with.

Because some of the control agents are diseases, there is always the risk of immunity forming, they become ineffective.

textbook

Collect a text book from the front of the room:
Read pg 87-89 (especially biological control)
Read pg 199-202; Q&A in full pg 202 # 24, 25, 26
Read pg 493-496, then:
Copy and complete: Pg 496 Essay topic #1

integrated control methods:

Integrated control methods are those that use several types of control. Organic, chemical, physical etc. Text book references: pg 302, 388, 493-496. Make notes on integrated control methods in your books.

Read the information below and highlight where integrated control methods are mentioned. (USA)

Dyer's Woad (*Isatis tinctoria*) is an herb associated with the mustard family. *I. tinctoria*'s origins date back over 2000 years. In Europe, this plant has been cultivated as a source of blue dye and for medicinal properties since the 13th century. Within the last century it has become a serious problem on rangelands and in cropland of the United States (Young and Evans 1971, Varga and Evans 1978). This plant, as found in Utah, is a winter annual, biennial, or a short lived perennial. The leaves are alternate, simple, petiolate, bluish-green with a whitish vein on the upper surface of the blade.

The flower has a flat top with yellow petals. The fruit is a purplish-brown pod containing one seed. Dyer's Woad has a thick tap root that can exceed 5 feet in depth. Shown above is a fence post tall Dyer's Woad plant along Hwy 89 in the northern part of Weber County.

This invader is found mostly in disturbed sites, such as range, cropland, dry areas, woodlands, and pasture sites. This a major problem because Dyers Woad overtakes native grass, and most livestock and wildlife don't graze it. Shown to the right is the typical habitat of our local Dyer's Woad - foothills that rise up to the east. This scene from a development near the Weber and Box Elder County lines shows how Dyer's Woad will take over when land has been cleared for development and then left alone for a time. Dyer's Woad is spread from place to place by seed, which become viable comparatively early during seed production. Fortunately, other than the sheer number of acres infested with this particular weed, it is rather benign compared to some of the other noxious weeds found in the county.

When Dyer's Woad is found in the middle of incorporated cities and no attempt is made to control the infestation, the environmental impact on both private gardens and public recreation can be severe. This recent photo (below) is taken from the Weber County Fairgrounds and shows Dyer's Woad inhabiting the Browning Army Reserve Center, which borders both Weber County and the City of Harrisville.

Traditional Methods for Controlling Dyer's Woad

Dyer's Woad is relatively easy to control both with herbicides and by good farming practices. The big challenge with this particular weed is the amount of acreage infested here in Northern Utah. The analogy that fighting weeds is like fighting wildfire really holds true with Dyer's Woad. Our practice is to respond to flare-ups away from the main body of weeds, but not to spend our time or resources attacking a thousand acre piece of Woad on the hillside where the ground is not in use anyway. There are many ways to be much more cost effective on other threatening weeds that not only pose more negative impact to the public, but occupy far less ground to where the expense of applying herbicides can be justified with noticeable result. Once again, it is extremely important that you READ AND FOLLOW THE LABEL with any herbicide you chose to use.

All is not lost, however, as a very effective biological control agent is working on the many infestations of Dyer's Woad wherever they are found. The "time line" featured near the bottom of the page represents a generalized guide to the most effective timing of chemical weed control for Dyer's Woad here in Northern Utah.

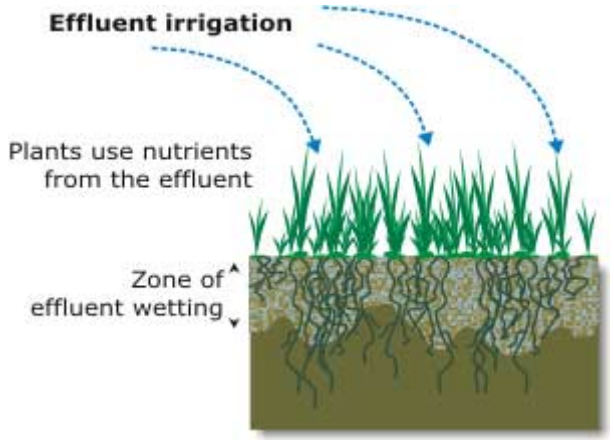
Integrated Control methods are the most cost effective way to attack an infestation of *I. tinctoria* in the majority of its settings. There are very good herbicides for treating Dyer's Woad in non-crop and rights of way environments. In croplands, good solid farming methods usually render this weed harmless. Orchards and vineyards make the worst cleanup challenge when Woad invades. In Northern Utah, many thousands of acres of Dyer's Woad inhabit our hillsides and valleys. Biological controls are the only practical hope for slowing the spread of what has already gotten quite a foothold here.

(*Isatis tinctoria*) is our enigma here in Northern Utah. A perfectly healthy plant can thrive amongst several others that are wilted and dying. Pictured to the left is a clump containing two or more plants in a field in Weber County. Notice that one plant is very stunted with a curled up look and is surrounded by healthy Dyer's Woad. It is those diminutive stems that are affected with a host specific fungus or rust. It is this fungus that is the hope of the future as far as containing the spread of Dyer's Woad.

There are no known weed feeding insects specific to Dyer's Woad that we know of at this writing. However, this close relative of the Eurasian rust fungus *Puccinia thlaspeos* is doing yeoman's work in the fight against Woad.

The rust can enter the plant through inoculation on the leaf surface and systemically damages the plant to the roots. It can prevent or reduce seed production and may also affect the survival of seedlings, rosettes, and overwintering plants. Researchers are not sure of the identity of this species and are uncertain as to how it moves through the plant. The rust is able to complete its life cycle on *I. tinctoria* alone and does not seem to require a secondary host like many rusts do. Photo below is of a rust infected Woad plant in Huntsville, rural Weber County.

Effluent:



Treatment and Recycling of Effluent:

Effluent contains organic matter and is high in biologically available N.
When it is treated and recycled correctly it is beneficial to the plants and soil.
The liquid part is suitable for irrigation.
The solid part is suitable for spreading and eventually mixes into the soil.

What are the positive impacts?

- Reduced level of chemicals in the environment (herbicides, pesticides, fertilisers)
- Improved soil stability and structure
- Increased organic matter
- Nutrient re-cycling (more worms and bacteria recycling the OM)
- Improved water quality (streams, rivers) due to less N getting into the water, and less sprays used.
- Farm dairy effluent is a natural, dilute liquid fertiliser. It contains nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), sulphur (S) and trace elements that you'd normally pay for to have applied to pasture

Effluent Information:

Think of dairy effluent as a resource, not waste. The average dairy herd (244 cows) produces the same amount of effluent as a town with about 3,400 people, such as Otorohanga.
The effluent of 100 cows is worth approximately $1,200 to $1,500 in fertiliser value a year.
Applying the maximum amount of nitrogen from effluent allowed per year (150 kg per hectare), also provides the following approximate amounts of nutrients:

17 kg of phosphate per hectare
135 kg of potassium per hectare
20 kg of sulphur per hectare
smaller amounts of magnesium and calcium

Effluent can be irrigated 'fresh' from a small sump or a tanker. However, irrigating from ponds or other storage facilities may give you better flexibility:

when soil is waterlogged (too wet to absorb the effluent)
if there is an equipment breakdown.

Remember to cover water troughs when irrigating effluent. Protect waterways on your farm by:

not irrigating within 50 metres of a water supply
leaving a strip of non-irrigated land next to all watercourses – at least 20 metres wide
ensuring that spray drift isn't getting into nearby streams or rivers.

Soil acts as a 'living filter'. It treats the applied effluent by changing it:

- physically – filtering out effluent particles, breaking them down and incorporating them into the soil structure
- chemically – absorbing nutrients and making them available to plants
- biologically – harmful micro-organisms (such as bacteria) present in the effluent are retained by the soil, or are killed when the effluent dries or when they become exposed to sunlight.

Soil can only filter so much effluent at a time. It's important not to irrigate to a depth of more than 25 millimetres during each application. This is because too much effluent can:

- kill pasture – especially where effluent has 'ponded' on the soil surface
- pollute nearby streams and rivers – where it runs off paddocks into waterways
- pollute ground water – by seeping too deep into the soil
- reduce pasture growth – by seeping too deep into the soil, past the root zone

What are the negative impacts?

If you apply too much effluent the paddocks can become saturated with water/effluent and ponding can occur. Ponding is a problem in 2 main ways:

- Smells
- Causes the grass/soil to "die" due to lack of oxygen in the soil. The pores become clogged.

The area you apply the effluent to needs to be away from streams, ditches and water ways to prevent the effluent from entering the water. Effluent can cause Eutrophication as easily as N fertilisers can.

Land based disposal of farm dairy effluent

problems:

Question 1:

A farmer is having trouble with crop production in a particular paddock. The paddock has been tested by the farmer. Results: pH=6, N high, P medium, K medium. What could be causing the poor crop production?

How could you fix the problems?

Question 2:

A sheep farmer is having trouble with drench resistant worms. What can be done to overcome this problem?

The following problems are a continuation from pg 9-10.

Photograph 3:
a windmill in an orchard

Photograph 4:
a school horticultural area where the students grow different crops in the raised plots

Photograph 5:
three compost bins used in a school horticultural area

QUESTION THREE
Refer to photographs 3, 4 and 5 to answer the following question.

Explain how the primary production management practices shown in photographs 3, 4 and 5 will have a positive impact on the environment.

Photograph 3

_____
_____
_____

Photograph 4

_____
_____
_____

Photograph 5

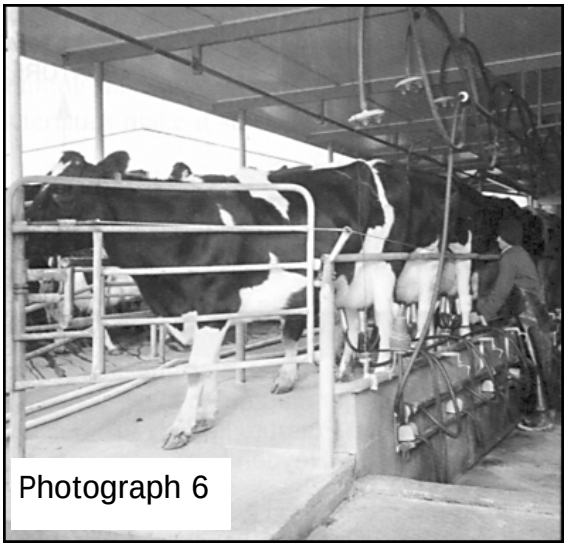
_____
_____
_____

Question 4:

The effluent (dung and urine) from cows in milking sheds needs to be managed so that it does not cause environmental problems.

Farmers can manage the effluent from cows by using the following practices:

1. spray the effluent onto paddocks
2. use settling ponds which allow solids to settle before the water enters waterways
3. wash the effluent down drains.



Photograph 6

Refer to photograph 6 and the accompanying text above to answer the following questions.

(a) Select the best management practice from 1–3 listed above and explain why it is the best.

(i) Best management practice: _____

(ii) Reasons why it is the best practice: _____

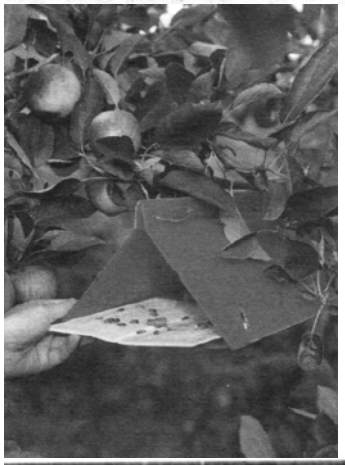
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

(b) Explain why the practice you have selected will have less impact on the environment than the other two management practices.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

For each of the following pictures, list what management practice is happening. Also list the positive and/or negative impacts that each will have on the environment.

Management practice:



Management practice:

Management practice:

Management practice:

Management practice:

Management practice:

QUESTION ONE:

Positive Impact of Primary Production Management Practices upon the Environment

Select and identify TWO of the management practices shown in the pictures on pg 19-20 that have a positive effect on the environment.

For each of the management practices selected, explain how the practice has a positive effect on the environment.

Management practice (1) _____

Explanation of how this practice has a positive effect on the environment:

Management practice (2) _____

Explanation of how this practice has a positive effect on the environment:

QUESTION TWO:
Negative Effects of Primary Production Management Practices upon the Environment

Select and identify TWO of the management practices shown on page 19-20 that have a negative effect on the environment.
For each of the management practices selected, explain how the practice has a negative effect on the environment

Management practice (1) _____
Explanation of how this practice has a positive effect on the environment:

Management practice (2) _____
Explanation of how this practice has a positive effect on the environment:

QUESTION THREE: Solution(s) to an Environmental Problem caused by a Management Practice

A negative impact on the environment is not desirable. When primary production impacts negatively on the environment, people try to solve the problem.

a. Select ONE of the management practices from Question Two (above) that has a negative impact on the environment:

   _____

b. Explain TWO solutions / management practices that might overcome the environmental problems caused by the primary production management practice
c. Which ONE of the two solutions / management practices you explained in (b) could solve the environmental problem more effectively than the other?

Justify your choice of this solution / management practice by explaining why it is the better solution.

Solution 1

Solution 2

Best choice

Justify

summary/revision

For each of the following headings list the positive and/or negative environmental impacts that can occur.

Fertiliser application:

Overcultivation:

Chemical spray use:

Effluent disposal:

Stocking rate:

Biological control:

Crop rotation:

Composting:

Ploughing in crop residue: