LESSON 3

PRACTICAL RISK MANAGEMENT

Aim
Assess horticultural situations for risks and hazards, and demonstrate methods and procedures to minimise risk.

WORK SAFETY

It is the responsibility of the employer to provide a safe workplace. Procedures for safe work should be formulated, implemented and managed. Management includes responsibility for education, training and supervision of staff to ensure compliance as well as regular reviews and audits.
Under a Safe Work Management Plan each task should follow a set procedure. Procedures should be formulated and written in such a way as to:

- Avoid unnecessary lifting, carrying, lowering or throwing of objects
- Reduce to amount of time an object is handled to as short a time as possible
- Prevent the need for double-handling through planning and work flow systems management i.e. make sure that the work flows from one area to the next by covering the shortest possible distance, and that benches and storage areas are at the correct height for heavy objects i.e. waist height.
- Have extra scheduled work breaks during periods when work is of a repetitive manner

Manual handling task should include the following steps:

1. Train staff in the necessary skills required to undertake a manual handling task
2. Plan the task before you commence
3. Ensure that each member of staff undertaking this duty is aware of the potential hazards
4. Ensure that the area is clear and enough room is left around the task to avoid injury through tripping or collision with objects
5. Ensure that each person is wearing the correct PPE (personal protective Equipment; this includes suitable clothing and footwear.

Ways to minimise risk during manual handling tasks could include:

- Smaller loads; larger loads may need to be divided into smaller quantities
- Use machinery for heavy carrying i.e. forklifts, conveyor belts, trolleys
- Minimise the need to reach, bend or twist
- Warm up before tackling prolonged, heavy or cumbersome work i.e. to prevent muscle fatigue and strain

ASSESSING SITES AND OPERATIONS FOR RISK

In order to reduce risk in the workplace it is necessary to:

1. Establish and maintain procedures for identifying hazards
2. Confirm the hazard i.e. in accordance with good OHS practice in horticulture and relevant legislation
3. Assess the risk associated with the hazard in accordance with the safe work practices in horticulture i.e. check OHS records, check industry standards check current codes of practice and relevant legislation.
4. Design the work processes to reduce exposure to OHS hazards through elimination or substitution or design a system that will reduce risk in instances where elimination is not possible and ensure that all administration is compliant. i.e.
   Hazard: Handling potting mix
   Risk: Exposure to contaminated potting mix containing the micro- organisms; tetanus bacillus and or legionella pneumophila; exposure may cause serious illness i.e. tetanus or legionnaire's disease
   OHS system: Use sterilised mix; immunisation i.e. tetanus; ventilation; reduce moisture as much as practicable; wear safety equipment i.e. appropriate masks.
   Sometimes short term solutions may also need to be implemented when a risk is identified that does not have an OHS procedure in place until more effective measures can be adopted as policy.
5. Put into place ongoing management procedures that are will implement and monitor OHS issues including compliance and regularly assess structures, machinery and work processes.

6. Manage and maintain the most appropriate control measures and regularly review the effectiveness of the control programs.

Further to the above in order to effectively introduce an OHS risk management system the following points also need consideration

- Staff training i.e. induction programs for all staff at all levels on OHS issues relevant to the industry sector.
- Ensure ongoing staff involvement i.e. adopt systems that allows staff input as well as ongoing training sessions. Management promptly addresses OHS issues raised through staff input.
- Maintain records according to OHS laws and conduct audits to ensure compliance include Material Safety Data sheets for all hazardous substances held on premises
- Establish a health and safety plan that includes emergency situations and ensure that all employees have a copy included in their duties statement.

EXAMPLE OF HOW TO ASSESS A SITE FOR RISK

Risk Assessment of Protected Crop Production

A detailed risk assessment of an operation should be conducted on commencement of that operation and reviewed annually, or improved as soon as an additional risk is identified. It is too late to improve after an accident has occurred. A near accident or a small mishap is justification to review and upgrade the assessment.

A standard risk assessment should include:

1. Background information and the purpose of the project – this should state location –the address should include postal address, physical location, Registered Plan and Lot number;

- *Access* – directions as to how emergency services can access the property, and the growing areas,
    - Proprietors – name and contact details of owners and management,
    - Insurance company – details and policy number
- *Previous use of the site* – if you are not sure of previous uses, do some research so you can provide a history of the site, it may be important if for example it was part of a cattle property and there was a dip site close to your work area,
- *Intended purpose and operational functions* – clearly state your intended purpose of the property –include the crops you intend to produce, marketing strategy and waste disposal.

2. The area(s) and people that may be at risk – site layout, provide a map of the layout of the property showing growing areas, services locations and pumps from dams, bores etc, show locations of waste water drainage, compost sites and staff facilities; quantity of staff and their work movements – names, addresses and phone numbers of all staff, their positions, responsibilities and work areas.

3. The risks - what and how it can happen – compile a list of things that could go wrong – pest/disease outbreak, fire, flood, power failure, complaints from neighbours re – noise, aroma, traffic, dust etc, and what strategies you have in place to alleviate risks

4. What do you do to control the risks and spread of out break. The consequences of a disease outbreak could be for example - shed(s) quarantined, identification of disease, agreed use of control method and rate of application, time for the control methods to be implemented and time for expected control, you would need to have dispatch paperwork in order so a recall or collection of infected product could be implemented quickly.

5. The adequacy of existing controls – safety plans – have you a safety plan approved and is your staff aware of how to implement it? Chances are that something will go wrong when you are not present, so staff must be fully aware of the safety plan. Frequency of government inspections – how often does your premises get inspected by government authorities – maintain a friendship with them – remember they are on your side and are employed to help and provide assistance. Ring and ask them to come and inspect your business, ask government experts to provide advice and can they offer suggestions on how to improve conditions to reduce risks

6. A rating of the consequence, likelihood and level of risk –
Nominate a rating for consequence - 1-minor, 2- intermediate, 3-significant, 4-major and 5-catastrophic
Likelihood rating – A – almost certain, B-likely, C- possible D – unlikely, E –rare
Level of Risk rating – Low, Moderate, or High

Identifying Hazards
Accidents happen because people in the workplace do not have the necessary skills to recognise the hazards that cause them. Once you have learnt how to identify a hazard or potential hazard you can then take action to eliminate or reduce the risk. The most important thing to remember is that a hazard is anything that has the potential to cause sickness or injury. Each and every person in the workplace has the responsibility to identify and report hazards. Once a hazard is reported, it is the employer's responsibility to recognise, remove or manage them.

The most important aspects in reducing workplace hazards are:

- Identify the hazard
- Take responsibility for both your own safety and that of co-workers
- Wear appropriate safety gear
- Behave in a manner that reduces accidents or injuries by working to company safety policies
- Follow instructions and training provided
- Report all potentially hazardous situations

Risk Control Methods
Most managers and experts follow a set of guidelines once a hazard is reported:
1. Eliminate the hazard: this is the most effective method of control. Hazards can be eliminated for example by using machinery instead of people to lift heavy objects
2. Find a safer alternative: One type of growing medium may be safer then another
3. Use an engineering or design solution: i.e. safety switches, circuit breakers, safety rails etc.
4. Think of a safer way: turning tools off at the power point after use to prevent accidentally triggering a power tool.
5. Wear personal protective clothing i.e. goggles, face masks, steel capped boots etc.

It is interesting to note that of the above five points, health and safety experts have identified no. 5 as being the least effective way of preventing workplace injury. Eliminating the hazard is the most effective way of reducing risk but is not always practical. Risk can be reduced or prevented by working through the above five guidelines and using most practical solution for each situation.

Conducting a Safety Audit
Safety Audits need to be conducted in order to identify, monitor and assess the safety hazards in a workplace. The information compiled in a safety audit forms a basis for controlling safety in the workplace; hence minimising preventable risks to workers.

A safety audit should be designed to be appropriate to the specific workplace it serves.

As such, when designing a safety audit, you need to consider every aspect of the workplace including physical facilities, people involved, materials and equipment, procedures, etc.
There are eight elements that have been identified as being significant to the health of workers in the workplace. These elements all need to be considered and where relevant addressed in the design of a safety audit form.

The eight elements identified as being significant to workers health are:

1. Exposure to HAZARDOUS SUBSTANCES & SETTINGS
   -resulting from inappropriate procedures, storage, handling, use, etc.

2. RUMOUR & SUSPICION
   -Incorrect or incomplete information through the media, from fellow workers etc. can lead to misunderstanding, are improper action by employees or employers.

3. LITIGATION RISKS
   -Increasing litigation impacts on safety issues.

4. COMPENSATION FACTORS
   -workers are increasingly seeking compensation from employers, even long after an event. (eg. passive smoking)

5. RIGHTS TO SAFETY
   Workers now have ethical/moral/legal rights to a safe work environment.

6. LEGAL REGULATION of the workplace
   -There is increasing litigation controlling aspects of the workplace including procedures practiced.

7. RESTRUCTURING of workplace organisations and awards

8. Activity of SAFETY OFFICERS
   -increased monitoring of workplace health & safety issues

AUDIT FORMS/CHECKLISTS

Every workplace should develop a standard audit checklist or form which can be worked with when conducting a safety audit.
Using this ensures that:
-The audit is comprehensive i.e. "everything" which you planned to consider is considered.
-Audits are standardised i.e. every time you conduct an audit, the same things are looked at.
-Audits are conducted in a logical and efficient way. i.e. the audit tasks performed can be arranged in a logical order that helps the auditor achieve the task more efficiently and effectively.

EXAMPLE OF AN AUDIT CHECKLIST

BUILDINGS

- Walls clean
- Windows clean
- Walls free of unnecessary hangings
- Proper light provided
- Platforms in good condition
- Stairs clean & well illuminated.
- Handrails and steps of sound construction and well maintained

FLOORS

- Appropriate floor surface
- Floor clean and free of loose material (clean in corners, behind furniture etc).
- Floor free of grease, oil etc.
- Floors in work area free of scrap or waste from work (eg. metal or wood scrap in a workshop)
- Unnecessary articles (eg. tools not being used) are off floor.
- Bins/receptacles provided for reuse.

AISLES

- Free of obstructions
- Safe & free passage to fire fighting equipment and fire exits
- Safe and free access to work positions
- Aisles clearly defined (eg. different coloured floor covers).

EQUIPMENT & MACHINERY

- Clean free of unnecessary material
- Free of unnecessary oil or grease leaks
- Free of corrosion, obvious deterioration
- Area around machines free of rags, paper etc.
- Area around machines clean and free of obstructions.
- Cupboards, lockers, stores, free of unnecessary material.
- Seating clean, in good condition and free of unnecessary material.
- Drinking fountains, taps, lunchroom and any other eating/drinking area kept hygienic.
- Toilets, showers, hand basins, etc hygienic and well ventilated
- Proper guards on machinery and in good condition.
- First aid equipment and materials well stocked, well stored, accessible and in good condition.

STOCK & MATERIALS

- Kept in appropriate storage areas
- Properly stored/arranged/stacked

TOOLS

- Stored neatly in proper place
- Clean: free of grease, oil, dirt, corrosion
- Storage facilities clean and in good condition
- Tools inspected and maintained routinely

GROUNDS

- *Free of rubbish (paper, food scraps, work wastes etc)*
- *Weeds controlled*
- *Ground surfaces even and accessible*
- *Drains in working order*
- *Gardens maintained*

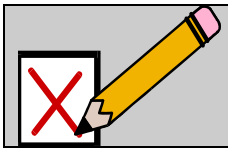
ADMINISTRATION

- *Appropriate records are kept*

CHECKLIST: FOR TOOLS AND MACHINES*:*

- *Loose parts: check moving parts in particular, as well as bolts and screws.*

- Adequate joins: where parts join (eg: the spade blade to the spade handle) should be strong enough, and firmly fitted, to withstand the rigours of hard work. For hand tools such as spades, shovels and forks the most likely place for breakages to occur is where the handle meets the tool head. It is important to ensure that you purchase tools with strong durable handles, and that these are subsequently well.



SELF ASSESSMENT
Perform the self assessment test titled ' test 3.1'
If you answer incorrectly, review the notes and try the test again.

USING TOOLS

Rules for Using Tools

* Don't overload - you will only damage a tool or piece of equipment and perhaps lose control, slipping or falling, and damaging nursery stock, equipment or yourself.
* Have a clear working area - obstacles and uneven working surfaces put a strain on both the worker and equipment, particularly when moving heavy or awkward things about.
* Many hands make light work - get help to do things which are difficult with only one set of hands. Accidents occur or time is wasted when a stubborn worker tries to do a difficult job alone.

How to Use a Chainsaw

To start with, clothing is an all important safety factor. Full time loggers wear heavy duty protective clothing as should any sensible chainsaw operator. First and foremost you should wear lightweight clothing which permits full freedom of movement. If you wear a jacket, make sure it is buttoned or zippered. Wide, loose, trouser legs should be tucked into boots. The use of heavy protective gloves will save your hands from a lot of cuts and scratches. Wear good boots or heavy shoes on your feet. You must be able to stand firmly and securely and your feet must be well protected. Use earmuffs or special earplugs to protect your ears. Eye protection is vital, so always wear protective glasses or goggles. A safety hat is also an important consideration. If possible, the use of a purpose built helmet with face mask and ear defenders provide excellent protection. Amateurs have a recommended option to wear safety clothing: In many countries, professional users i.e. those working with a chainsaw as part of their employment, whether self-employed or not must, by law, wear specialist chainsaw boots, gloves, helmet, mask and ear defenders in conjunction with nylon fibre reinforced trousers and jacket or waistcoat (usually Kevlar reinforced). Be sure you know the regulations in your locality and act accordingly.

Basic Rules for Handling a Chainsaw

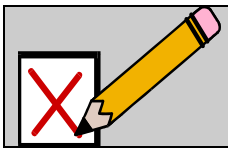
When using a chainsaw, it is important to have the correct stance, and to hold the saw correctly. The following instructions give a good guide as to how use a chainsaw safely. Practise with saw turned off until you automatically know how to stand and hold the saw. Remember that chainsaws are not adapted for left-handed use, so instructions apply, as given, to all users. Some basic rules for using a chainsaw include:

- Your feet should be spread wide apart to improve your balance. You should feel that you are standing steadily and securely.
- Always keep your left thumb underneath the front handle bar. If you hold your thumb on top of the handle bar, the saw can easily jerk out of your hands if it kicks back.
- A chainsaw should be equipped with a kick-back guard to protect your left hand. Another safety feature is the chain brake. The brake is connected to the kick-back guard and stops the saw chain immediately if the kick-back guard is pushed forward and trips the brake mechanism. Check the chain break is operating properly before starting, and periodically during operation.
- The motor should be running at top speed before you start sawing. If the chain stops or rotates too slowly when you start sawing, the teeth will grab in the wood and pull the saw. Start sawing as close as possible to the body of the saw. Don't force the tool when cutting.
- When you saw with the pulling chain (i.e. when you saw with the underside of the guide bar) the body of the saw is pulled in towards the tree trunk. When you cut with a pushing chain - use the top of the guide bar - the saw is pushed away from the tree trunk.
- Try to keep the saw close to your body. You can hold it more firmly there. If you saw with your arms outstretched, you will quickly tire.
- Whenever you attempt to saw with the tip of a chainsaw guide bar, THE RISK OF KICK BACK IS HIGH. Always be aware of the danger, and if you have to use the tip of the saw, make sure that the saw is running at top speed.
- Only ever cut wood. Never allow the chain to touch soil or other foreign matter.
- Maintain a safe distance from other people and power equipment. Maintain a safe, clear working area around you such as removing small branches or obstacles that could be tripped over.
- Shut off the motor before making major moves such as walking to another tree that needs to be felled.
- Always wear goggles when using a chainsaw or brush-cutter.
- Never operate a machine close to other people (grass, twigs or stones can be flung at people).
- Always wear thick boots and long pants – safety footwear is recommended for blade brush cutters.

- Keep your distance from the spinning cord or blade and turn the machine off before putting it down.
- Don't operate the machine when you are fatigued.

Starting a Chainsaw
Check the fuel and chain oil. Place the saw on the ground. Make sure that the chain cannot get caught in scrub or branches. Check that you know where all the controls are located. Set the choke and throttle etc. Put your foot right through the rear handle. Hold the front handlebar with your left hand. Pull to feel if the starter mechanism is engaged. Make a short sharp pull. Follow through back with the starter handle. As soon as the saw starts, check that it is pumping oil to the chain. Point the guide bar towards a stump or another light background with the chain running. You can then see whether chain oil is splattering out from the guide bar.

How to Use a Ride-On Mower Safely
- Before starting the mower, walk around the area and pick up any rocks, wires, sticks, etc. that the blade might throw up.
- Operator should be seated before starting up engine or engaging mowers.
- Mow in dry conditions whenever possible to prevent slipping, especially on slopes. Mowing wet grass may block the mower and leave a ragged finish.
- Mow up and down the slope – never across the slope – if it is greater than 5 degrees. A 15 degree slope is considered the maximum slope for mowing. Avoid mowing uphill with a full grass bag or box as this will make the mower unstable.
- If the grass is excessively long, cut it high to start with. This helps to prevent grass clumping in the discharge port and exposes any objects that could be thrown up by the blade.
- Discharge the collection bag frequently as a full bag or box will not pick up the grass properly.
- Do not mow in reverse unless absolutely necessary and you are certain no-one is behind you.
- As you reverse, disengage the blade and look behind you and down before and while you back up.
- Never carry passengers on the mower or on any implement being towed.



SELF ASSESSMENT
Perform the self assessment test titled ' test 3.2'
If you answer incorrectly, review the notes and try the test again.

How to Safely Use a Pedestrian Controlled Rotary Cultivator
The starting operation will depend on the type of machine you are using and is also differs according to brand. Make sure that you read the staring instructions carefully before attempting to start the machine.

The following applies to operation of any type of cultivator:
*Make sure your feet are clear of the blades
*Do not allow other people near the machine whilst in operation
*Make sure that the machine disengages and engages as required

1. Use Personal Protective Equipment (PPE): Eye Protection, steel Capped Boots, overalls, gloves

2. Do a maintenance checks before operating: Top up petrol and oil levels if necessary, in an open (unconfined) situation to ensure that you do not inhale fumes. Do not re-fuel near naked flames i.e. equipment that causes sparks, cigarettes. Make sure tines are clear of debris i.e. roots or string etc. and that they are securely fastened.

3. Check the area that you are going to hoe. Clear it of debris including rocks and large stones, branches tree roots etc. Survey the land i.e. is it steep, is the soil hard/soft? Hard soil should not be cultivated; make sure it is soft and slightly damp. (This causes less likelihood of injury in the form of sprains, strains and from flying debris) Check for dry grass nearby as this can present a hazard i.e. fires ignited by sparks from tines hitting stones; have a fire extinguisher on hand.

4. Always look in the direction the machine is moving i.e. in front when the machine is moving forward or over your shoulder when reversing.

Using Brush-Cutters

Brushcutters are either attached with a petrol driven or electric motor. They come in a range of models and sizes with either a single unit attachment i.e. nylon cord or with the ability to change attachments i.e. cord, blade or saw blade.

1. You must use the correct brushcutter fitting for each task i.e. Steel circular saw blades are used to cut through small shrubs and trees up to 50mm in diameter. Steel, plastic or rubber blades are used for general clearing tasks i.e. grass, pasture weeds. Cutting cord or pivoting plastic blades are used for grass and weeds.

2. *As there are various types of brushcutters on the market make sure that you read the manufacturer's instructions for the brand you are using

*Do a safety check before starting by – checking that the cutting blades are sound (with no cracks and clean) – the mounting components are not worn – that the harness fits or is adjusted to suit you.

*It is essential to wear the correct Personal Protection Equipment when using a brushcutter including steel capped boots, leg protection, comfortable clothing that is not flowing or too loose, and eye and ear protection.

*Electric brushcutters should also be fitted with an earth leakage circuit breaker or isolating transfomer to protect the user from electric shock.

*All brushcutters should be fitted with a safety guard that protects the user from flying debris.

*Always have a fire extinguisher on hand; brushcutters can cause fires through hot sparks.

*Use a harness and shoulder straps to take the weight of the brushcutter thereby reducing the incidence of sprains and strains.

*Make sure that there are no people within 25 metres of where you are using the machine; loose stones and other debris can travel at quite fast speed over a long distance causing a potential hazards to people nearby.

*When using the cutter make sure that the cuttings are thrown away from your body

*Make sure that the brushcutter head is well clear of your feet and legs.

3. Do a site survey before undertaking brushcutting work. Check the area for debris and remove large sticks, stones etc. Check for holes and ditches and old tree stumps beneath undergrowth to prevent tripping..

*Do not use a brushcutter on slippery or steep terrain

*Do not use a brushcutter above shoulder height

4. Refuel away from the site so that inadvertent fuel spills are not ignited through sparks. Don't refuel until machine has cooled down. Don't smoke whilst operating or refuelling.

Using a Knapsack Sprayer

Knowing how to use a knapsack sprayer correctly is essential for the successful application of horticultural chemicals i.e. herbicides, pesticides and weedicides i.e. when using herbicides to control weeds within a crop the application needs to be precise and uniform throughout the crop

The correct rate is imperative at the crops ability to tolerate herbicides and the amount needed to kill a weed can be extremely close. Under application can mean low cropping due to weed competition over application can lead to the death of a crop and chemicals residue in the soil that may affect subsequent plantings.

Nozzles are made up of a spray tip, a filter (strainer) a nozzle body and a cap. The amount of flow and the way in which the spray is distributed is determined by the spray tip. Multi nozzle hand held spray booms are also available. And these help to increase the spraying efficiency.

A variety of spray tips are available to suit various situations i.e. Flat fan, even fan, flood, variable cone, hollow cone and each needs to be calibrated to ensure efficient spray patterns.

Calibration means working out the amount a sprayer will output over a certain pre-determined area and is influenced by:

- The speed at which the operator walks i.e. the faster you walk the less spray applied to a given area.
- The capacity of the nozzle
- The type of spray tips used
- Whether a single or boom spray is used
- The pressure will also influence the sprayer

When purchasing a knapsack, instructions are provided in relation to use and calibration processes, the output of the knapsack sprayer unit should always be pre-determined using water and by walking over the terrain in question for a set area, the usual pace is 1m per second. The water is collected as you spray and then measured to determine how much liquid you have used. The area you covered is also measured. From these calculations you can work out how much herbicide you need to cover the area in question. A more detailed outline on calibration is included in the following lesson.

Pressure Regulators

Most knapsacks do not come with a pressure regulator valve as standard however it is important to maintain a constant pressure and this can be difficult when using hand regulated pressure, particularly when the operator has spent several hours using the unit. A pressure regulator valve is a useful and reasonably economical addition as it enables the operator to make simple and accurate sprays eliminating under or over spray. Accurate calibration is also reliant on pressure regulation.

Spray Tips

Flat fan spray tips are only used for multiple nozzle boom sprayers. The spray pattern is designed to create an even pattern across the spray boom by overlapping each nozzle with the adjacent one, the centre nozzle is at full flow gradually tapering out to the edges and a light flow.

Even Fan spray tips are only used on single nozzle knapsacks and are designed to be used as single pass sprays over crops or between the rows. It creates a uniform spray with a full flow rate from edge to edge.

Flood (cut) spray tips are commonly used by knapsack operators, they have a wide spray pattern that is tapered from centre to edge and are used for application of total kill weedicides. There must be a 50% overlap in the spray to overcome the un-even spray pattern made by these tips.

Variable cone tips are used to apply total kill herbicide, fungicide and insecticide are extremely versatile cone shaped tips that can be adjusted from a solid stream to a very fine mist spray however calibration is known to be difficult.

Hollow cone tips have a very fine multi-angled spray mainly on the outside edge of the pattern and are mainly used for insecticides in situations where good coverage is essential. However, because of the fine spray pattern they do have a tendency to spray drift.

Strainers or filters are very fine mesh screens used for all solutions that are mixed with unfiltered water. They are located in the spray body and designed to filter out impurities that have a tendency to clog up the nozzle tips. Rinsing in water and or brushing with a soft brush are the best ways to unclog nozzle tips.

Heavy duty protective suit, gloves, hat, goggles and respirator mask. It is important to use protective clothing like this when working with herbicides and other poisons

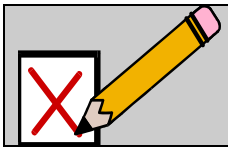
Applying Sprays

The uniform application of herbicide is important to crop health and weed control. It is difficult to achieve a uniform spray using a single nozzle lance attached to a knap sack over large areas. The lance is swung from side to side as the operator moves forward, human error i.e. variation in walking speed, poor mixing and a variable pressure, means that the spray will be uneven. This problem can be somewhat overcome by attaching a boom sprayer to the knapsack i.e. with three or four appropriate nozzles and a pressure valve, this also gives a very wide spray area of up to 3 metres

Consider what safety issues might arise from operating spray equipment with inadequate protective clothing

Attaching Implements to a Tractor

*Always make sure that you are fitting attachments according to the manufacturer's instructions for each attachment.
*Each implement will have specific draw bars or mounting points make sure that each implement is attached to one provided by the manufacturer.
*Only alter the height of the draw bar if it has been supplied as fully adjustable by the manufacturer
*When towing implements always check that the safety pins are in good order
*Always use the guards provided by the manufacturer before operating towed implements.
*DO NOT hitch towed implements above the centre line of the rear axle, the axle housing or to the top link pin
*Make sure all machinery is switched off and not moving before making adjustments
*The PTO shaft should always be guarded, do not attach implements if it isn't.
*Always lower the towed implement and the three point linkage when parking



SELF ASSESSMENT
Perform the self assessment test titled ' test 3.3'
If you answer incorrectly, review the notes and try the test again.

Safety and Irrigation Pipes

Metal irrigation pipes can be the cause of serious accidents particularly through electrocution on the farm or other horticultural sites.
*Make sure that you load and unload trailers correctly
*Never stand on trailer to unload irrigation pipes
*Don't stack irrigation pipes under electricity lines
*Always carry irrigation pipes horizontally, don't up-end the pipe before checking for overhead power lines

Safely Using Ladders and Access Equipment

Firstly ladders should only be used as access i.e. used to gain access to a work area not as the actual work area. Scaffolds or other mobile access equipment (i.e. cherry – pickers for tree lopping) should be used instead of ladders when a work area is required i.e. when painting, building, etc.
Ensure that there are no:
*Missing or wear and tear i.e. cracks, splits or decay on rungs
*Warped, cracked, split, sagged or stiles
*Splinters, sharp slivers or edges on either the rungs or stiles
*Damaged, worn or split ends to the stiles
*Slippery substances i.e. grease, oil etc on the ladder
Ensure that:
* The metal tie rods are secure and none are missing
* The extension locks are in place and are functional
* Hinges, swivels and sliding joints are in good repair

Using Ladders

*Always place on flat level ground and on a stable surface
*Do not use props under ladders, including planks, bricks etc
*Incline to a ration of 1:4 horizontal/vertical
*Don't place behind a closed door unless the door is locked
*Always face the ladder when ascending or descending and firmly grip the rungs or the stiles
*Do not overreach or straddle the ladder and another foothold
*Do extend a ladder at least 1 metre above a working platform
*Only allow one person at a time on the ladder

Moving ladders
*Heavy and long ladders should be moved by two people
*Take care when moving around corners and going through doorways, check for clearance
*Always carry in a horizontal position
*Check for overhead electricity cables

Handling Bricks and Pavers
To prevent muscle fatigue and back injury:
*Minimise the time spent stooping i.e. have rest breaks periodically
*Don't over stretch i.e. keep bricks or pavers as close as practicable to the area under construction
*Use safe manual lifting procedures
*When moving bricks or pavers in a wheel barrow avoid soft or sandy surfaces i.e. use planks
*Don't through bricks for other workers to
*Always use the correct transportation equipment i.e. sturdy wheel barrows or brick trolley
*Make sure that when you are moving pallets of pavers or bricks that the strapping is secure.

HOW TO MANUALLY HANDLE OBJECTS IN A NURSERY
Some simple techniques can prevent a lot of the injuries that are common as a result of manual handling of objects. This applies to many horticultural tools that are commonly used. These techniques include:
*Always bend your knees and keep you back straight when reaching down to pick up something.
*Don't attempt to lift anything that may be too heavy for you. Try rocking the object first to get an indication of its weight. Get help if there is any doubt about whether you can easily lift the object.
*Use work gloves and safety boots, particularly if the object may have sharp or rough surfaced parts, where insects or spiders may be present, and just in case you drop the object.
*Don't overexert yourself or put yourself in a position where you can overbalance. This applies particularly when straining to use such tools as rakes, shovels, crowbars and heavy mechanical equipment.

The following is revision of information that was covered in Practical Horticulture 1:

Manually Lifting Objects
Poor lifting technique is probably the biggest single cause of back injuries at home or work. Where possible use alternative ways of moving objects, such as a trolley, or a wheel barrow, or for very heavy items use a forklift, lifting devices on tractors, or perhaps a bobcat if these are available. If you intend to manually handle the object, however, then try and practice the following good lifting habits:

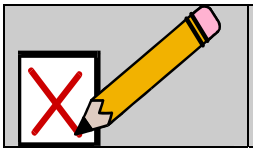
- Test the weight of any thing you are going to lift carefully. Simply pushing it, or tipping it a little will help give you a "feel" for how heavy it is.
- Avoid twisting or jerking while lifting or carrying anything, or you might injure the joints which help guide movement in the back.
- Avoid leaning forward when lifting to minimise stress on the spine. Injuries most commonly occur when you lean forward and twist at the same time.
- Know your limitations & don't push it…you may suffer for life.
- Always warm up & stretch before lifting.
- Use gloves to minimise the likelihood of hurting hands from splinters, sharp edges, etc, and to give you greater grip on slippery surfaces. Good grip is also important for foot wear.
- Whenever possible get help lifting, particularly if objects are heavy, large, or difficult to get a grip on or hold. While many hands make light work, it is important to make sure all hands move in the same direction. Talk first, get a plan then work together.
- Before you lift make sure you have a clear path with plenty of width, nothing to trip over or bump into, and check that floor surfaces aren't slippery.
- Items that might be readily damaged if they are bumped against other things can be protected by wrapping them in a blanket or something similar.

How to Lift

- Stand close to the object you wish to lift, but not too close that you are crowded.
- Place your feet shoulder width apart.
- Bend down towards the object from the hips and knees.
- Take hold of the object carefully, making sure that you have a good grip.
- Use your leg muscles to lift your body and the object upwards.
- Keep your back as straight as you can at all times while doing the lift, and subsequently moving the object.
- Lowering the object should be the reverse of the lifting technique.

Other Ways of Lifting

- The wheel (one of mans first inventions, and still one of the best). Trolleys, pulleys, wheelbarrows, or low boards on strong wheels (fridge trolleys) can be manoeuvred under items to be lifted, or used to transport items from place to place once you have manually lifted them, to greatly reduce the effort, and the stress on your body required in shifting them. Such tools can often be moved beneath heavy objects by carefully rocking the object onto its edge, moving the trolley, etc. under it, and then lowering the object back down.
- Leverage can be easily applied to heavy objects to either raise them enough to move a trolley or something similar beneath them, or to actually move the object short distances using tools such as crow bars.
- Ropes can be used to drag or lift items by such means as a simple pulley system, or by towing the item behind a vehicle, or hand towed when the object is on wheels or rollers. Be sure the rope/s is securely attached, and off sufficient strength, particularly when objects are being lifted up off the surface. Also make sure that what you are hanging the ropes from, or attaching them too, has sufficient strength to hold the weight of the object.



SELF ASSESSMENT
Perform the self assessment test titled ' test 3.4'
If you answer incorrectly, review the notes and try the test again.

Safe Use of Chemicals

Spray Programs

Spray programs involve applying a series of sprays at predetermined stages of a plant's development in order to stop the pest and disease problems which are most likely to occur on that particular plant before the problem becomes too serious.

To be sure of good quantity and quality in some crops (eg. certain vegetables and fruits) spray programs are still part of the overall cultural practices.

Most growers now implement an IPM system as part of their management strategies.

Please note that some of the chemicals listed may not be used legally in your country, as new research progresses chemicals may be banned for use.

Chemicals are termed as poisons under health regulations. Most countries will have their particular regulations in relation to the sale and use of Chemical pesticides. Material Safety Data Sheets also known as Pesticide fact Sheets are available for all chemicals pesticides from the manufacturer as well as online.

Information in relation to the status of chemicals throughout the world (whether they are classified as restricted use or have been banned) can be accessed through the World Health Organisation and also online at www.pesticideinfo.org. It is imperative that the user is up to date with the latest developments as the status of chemicals and their use changes regularly.

Following is an example of how poisons are classified as defined by the Standard for the Uniform Scheduling of Drugs and Poisons in Australia (an example for your country will be available through the appropriate authority in your region). This schedule differs to documents relating to the status of chemicals and should be viewed as a separate document.

Schedule 2 - poisons for therapeutic use that should be available to the public only from pharmacies; or where there is no pharmacy service available, from persons licensed to sell Schedule 2 poisons.

Schedule 3 - Poisons for therapeutic use that are dangerous or are (so) liable to abuse as to warrant their availability to the public being restricted to supply by pharmacists or medical, dental or veterinary practitioners.

Schedule 4 - Poisons that should, in the public interest, be restricted to medical, dental or veterinary prescriptions or supply, together with substances or preparations intended for therapeutic use, the safety or efficacy of which requires further evaluation.

Schedule 5 - Poisons of a hazardous nature that must be readily available to the public but require caution in handling, storage and use.

Schedule 6 - Poisons that must be available to the public but are of a more hazardous or poisonous nature than those classified in Schedule 5.

Schedule 7 - Poisons that require special precautions in; manufacturing, handling, storage or use, or special individual regulations regarding labelling or availability.

Schedule 8 - Poisons to which the restrictions recommended for drugs of dependence by the 1980 Australian Royal Commission of Inquiry into Drugs should apply.

Schedule 9 - Poisons which are drugs of abuse, the manufacture, possession, sale or use of which should be prohibited by law except for amounts which may be necessary for medical or scientific research conducted with the approval of Commonwealth and/or State or Territory Health Authorities.

Law

Manufacturers, wholesalers, retailers, advisers, farmers, veterinarians, ground and aerial spray applicators and householders should all be aware of regulations concerning the spraying, storage, transportation and disposal of chemicals. Ignorance is no longer an excuse!

Each state, country or region may enforce a different Act to control chemical use. It is advised that you become acquainted with your local law and relevant Acts.

WARNING:

Some chemicals listed may be restricted or banned in some countries.

Chemicals are constantly under review and various countries or states have differing laws governing use. It is imperative that you research chemicals before using them. Remember that a product may have restricted use i.e. it may only be used to control a particular pest on a particular plant: it may not be used to control the same pest on a different plant

e.g. In the UK, a product with the active ingredient chlorpyrifos may be used to control aphids on Brassicas in general production, but not on Brassicas grown as fodder crops: dimethoate may be used to control thrips on peas, but not on other plants

Labels

The label offer a wealth of information concerning safety precautions, application rate and modes, directions, storage conditions, first aid and safety instructions, batch numbers and container disposal instructions.

Registration safeguards of chemicals assess:

- Residues in foods
- The safety of persons using the chemicals
- Environmental safety
- Safety to the plants or animals being treated
- Trade issues.

After reading the labels always adhere to:

- do not exceed label dose/application rates
- do not apply chemicals more frequently than label instructions
- do not use chemicals contrary to a specific label prohibition
- observe withholding periods stated on the label.

NB. Permits may be granted by some states to use chemicals outside these restrictions.

As an example: The Agricultural and Veterinary Chemicals (Control of Use) Act 1992 (Vic) Australia states that any person who carries out spraying with an agricultural chemical which:

- Injuriously affects any plants or stock outside the target area, or
- injuriously affects any land outside the target area, so that the growing of plants or keeping of stock could be reasonably expected to result in contamination.

...could be committing an offence. This applies to all types of application (eg aerial, mister, spot spraying).

You should be aware of the regulations in your country as well as those for your state /region

Material Safety Data Sheets (MSDS) or Pesticide Information Sheets are available for all manufactured chemicals. You should ensure that you have a copy of each sheet for every chemical that you have in use or storage.

WHAT CHEMICAL CAN BE MIXED WITH WHAT?
Incompatible chemicals give an undesired chemical reaction when mixed. Mixing chemicals inappropriately can cause a threat to health and safety through an explosion, fire, and/or formation of toxic materials. It can also result in an unwanted change in the physical or mechanical properties of the materials.
Even everyday chemicals have incompatibilities. For example mixing bleach and ammonia, you would the toxic gases chloramine (NH2Cl) and hydrazine (N2H4) an extremely toxic substance that can cause injury or death. This is just one example there are obviously other lethal combinations.

MSDS Relevance
Fortunately, chemical incompatibility (as well as compatibility) is listed on the MSDS. It is the responsibility of the user to read the MSDS for every chemical they use.
Also note that most adverse chemical reactions occur during chemical spills. Correct storage and handling techniques should be implemented by the user.

SAFETY PROCEDURES WHEN USING AGRICULTURAL CHEMICALS
GOLDEN RULES FOR USING CHEMICALS
1. ONLY use chemicals when actually needed!
2. Use the correct chemical for the job at hand, if unsure; seek advice.
3. Always read the label, and the MSDS or Pesticide Information Sheets
4. Use protective clothing at ALL times.
5. Use the correct pesticide application equipment.
6. Don't spray on windy or very hot days!!!!
7. Warn other people in the area that you are going to spray (and have sprayed)
8. Wash out all spray equipment thoroughly when finished (to government regulations and guidelines)
9. Do not eat or smoke while spraying.
10. Wash all protective clothing thoroughly after spraying.
11. Wash yourself thoroughly after spraying -especially the hands.
12. Store spray equipment and chemicals in a safe, locked place.
13. Dispose of empty pesticide containers according to the label instructions (and government regulations)
14. Record all details of your spraying...

KEEPING RECORDS
Records of pesticide usage are particularly important when using weedkillers.
The record will help you to.....

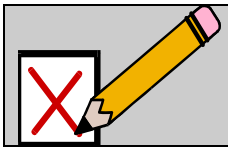
- Improve pest control practices and avoid unnecessary pesticide use
- Compare applications made with results achieved.
- Purchase only the amounts of pesticides needed.
- Reduce inventory carry over
- When errors occur, establish where they were made.
- Establish proof that you used recommended procedures if indemnity payments are involved.

WHAT INFORMATION SHOULD BE KEPT

- Varieties of plants treated
- Pests (Weeds) treated.
- Location & size of area being treated.
- Time of day, date & year.
- Type of equipment used.
- Pesticide used including name, type of formulation, trade name, manufacturer & batch number.
- Amount used per hectare or per 100 litres of water
- Amount of active constituent (i.e. chemical) per hectare or per 100 litres water
- Stage of plant development (size of pot & size of plant)
- Pest/weed situation (eg: severe, mild ...etc)
- Weather, temperature, wind, rainfall etc
- Whether the chemical was watered in afterwards
- Results of application....how long before weeds died, how well it worked

RECOMMENDATION

Obtain copies of pesticide compatibility charts from the Department of Agriculture or similar government department in your region.



SELF ASSESSMENT

Perform the self assessment test titled ' test 3.5'

If you answer incorrectly, review the notes and try the test again.

SET TASK

1. Contact your local Workplace Health and Safety Authority (or similar authority in your region) and collect safety information and guidelines relevant to the horticulture Industry.

2. Find a workplace where you are able to undertake risk assessment for various tasks (industry sector of your choice) (see assignment question 1).

- List the chemicals that are used in this business and how they are stored, take notes.
- What types of PE does the business have?

3. Collect MSDS for chemicals used in the horticulture workplace at which you are undertaking risk assessment.

4. Design a Safety Audit Form suitable for use in a specified horticultural business.

ASSIGNMENT

Download and do the assignment called 'Lesson 3 assignment'.