



Implement a grassed area maintenance program

AHCTRF303

By the end of this topic, you should be able to:

- Prepare for grassed area maintenance work
- Maintain and repair grassed areas
- Coordinate and report on grassed area maintenance activities

Grassed areas

- The differing characteristics of grass influence what purpose they are selected for. For example:

Grass	Features	Suited for
Blanket/Carpet grass (<i>Axonopus compressus</i>)	- Best adapted to warm, lowland tropics - Low tolerance of salinity and drought - Suitable as turf in moist, low fertility soils, and shaded areas	- Ground cover - Permanent pasture
Blue Couch (<i>Digitaria didactyla</i>)	- Can tolerate acidic soils (pH equal and lower than 5.5) - Excellent heat tolerance = thrives in both heat and humidity (moderate tolerance to cool environments) - Low invasive properties - Moderate to good wear tolerance - Intolerant to weed sprays	- Commercial projects - Parks - Residential lawns - Sports arenas
Colonial Bentgrass (<i>Agrostis spp</i>)	- A fine-textured grass with upright leaves and dense growth - Grows best in cool, humid weather - Low tolerance to heat, salinity, water stress and traffic - Requires frequent irrigation because it has a shallow root system - Tends to be susceptible to a wide range of diseases - Tolerates some shade	General lawn areas

Grassed areas

- The differing characteristics of grass influence what purpose they are selected for. For example:

Grass	Features	Suited for
Creeping Bentgrass (<i>Agrostis spp</i>)	- Capable of very low cutting heights - Requires frequent irrigation because it has a shallow root system - Requires high level of nitrogen fertilisation - Not suitable for home lawns or other general-purpose turf	- Bowling greens - Golf greens - Lawn tennis
Fine Fescue (<i>Festuca spp</i>)	- Cool season turf grass - Has either a clumped or creeping type of growth - Moderate wear tolerance (not for constant high traffic areas) - Tolerates poor soil, drought and shade well	Home lawns
Kentucky Bluegrass (<i>Poa pratensis</i>)	- Common in cool, moist climates - Grows in well-drained, fertile soil - Does not perform well in shade	- Golf fairways - Parks and gardens - Pasture plant

Grassed areas

- The differing characteristics of grass influence what purpose they are selected for. For example:

Grass	Features	Suited for
Kikuyu (<i>Pennisetum clandestinum</i>)	- Ability to grow in very poor soil types - Endures heavy wear and tear - Fast growing = high maintenance in warmer months - Good drought, heat and wear tolerance - Thrives in humidity and full sun, doesn't grow well in heavy shade - Difficult to mow and is prone to thatch heavily - Can be invasive, unless a sterile variety	- Parks and ovals - Permanent pasture - Residential lawns
Sir Walter Buffalo (<i>Stenotaphrum secundatum</i>)	- Soft leaves, unlike original forms of Buffalo - Hard wearing - Low maintenance - Resistant to weeds, pest and disease - Tolerant to drought, shade and sun - Will re-establish itself in damaged areas in summer	- Business lawns - Residential lawns - Parks

Grassed areas

- The differing characteristics of grass influence what purpose they are selected for. For example:

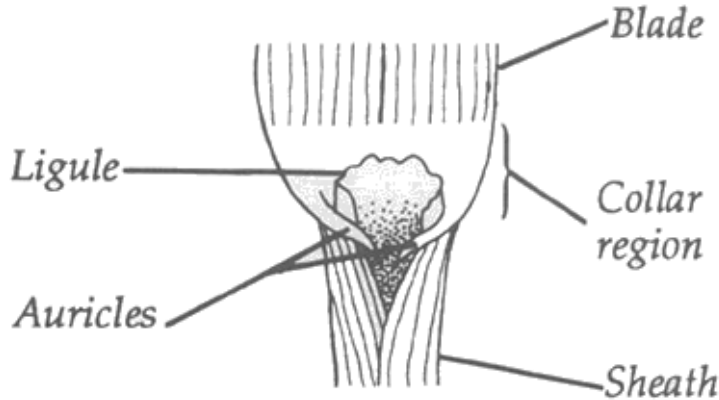
Grass	Features	Suited for
Tifdwarf [Couch] (<i>Cynodon dactylon</i>)	- Disease resistant - Drought and heat tolerant, suited to warm seasons - Quick recovery from injury - Slow growing = less mowing - Tolerates heavy traffic - Tolerates low mowing = low profile - Vigorous growth habit	- Bowling greens - Croquet courts - Golf greens - Tennis courts
Zoysia (<i>Zoysia japonica</i>)	- Deep rooted, requiring infrequent irrigation - Highly tolerant to heat - Less prone to weeds, pests and disease than most lawn types - Recovers well, but at a slightly slower rate than Couch - Salt and drought tolerant - Very low lawn mowing requirements - Not suitable for colder regions	- Residential lawns - Business use - Government and municipal grounds

- Grassed areas require to be maintained for many reasons, including:
 - Preventing overgrown areas
 - Preventing soil compaction
 - Preventing weed/pest invasion
 - Rectifying uneven surfaces
 - Reducing mat/thatch build up (i.e. build up of undecomposed grass fibre on the surface of the grassed area)
 - Repairing worn areas

Having a sound turf management program will ensure a healthy turfed area.
This is the best method of pest control.

Grassed areas

- As part of maintaining a grassed area, it is important to understand grass physiology – especially so as to distinguish grass from weeds



The structure at the junction of blade and sheath

Appendages that protect from either side of the collar

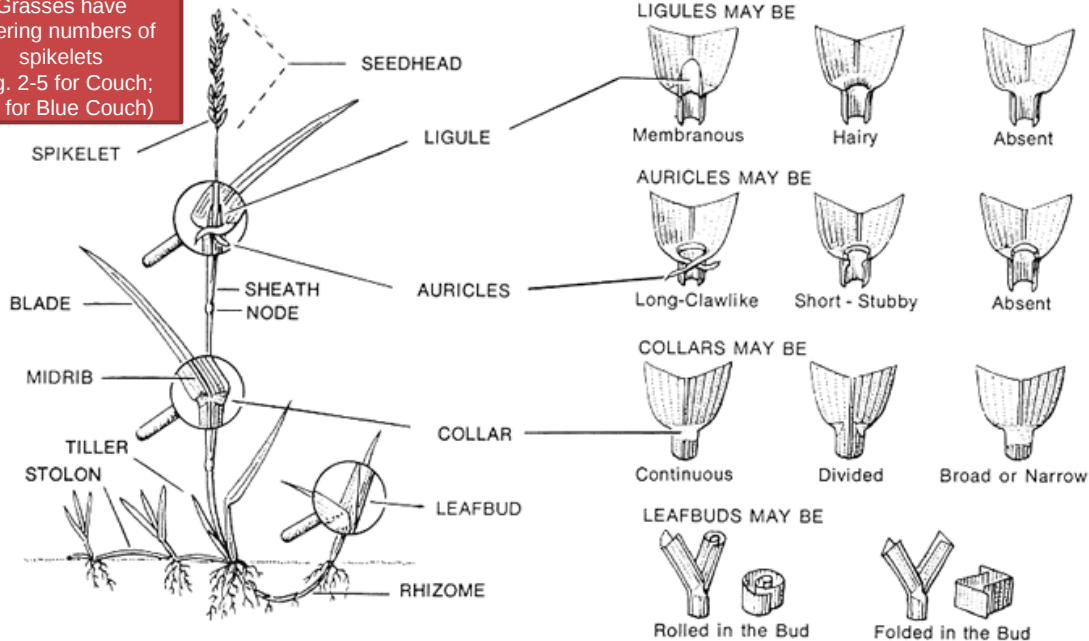
The upper portion of the leaf

The area outside of the leaf where the blade and sheath join

The tubular portion of the leaf which wraps around the stem

Grassed areas

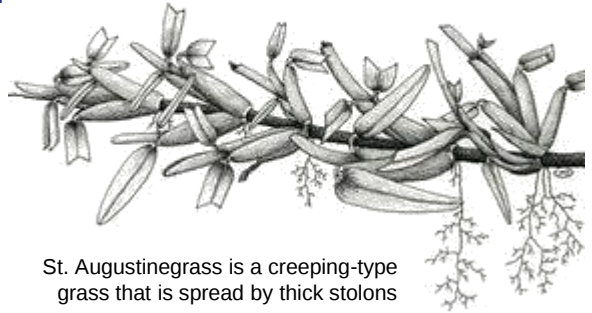
Grasses have differing numbers of spikelets (e.g. 2-5 for Couch; 3-6 for Blue Couch)



The arrangement of leaves in the bud shoot is known as vernalion

- Generally warm season grasses are established by vegetative propagation by:
 - Planting sprigs (i.e. part of stolon or rhizome)
 - Planting sods (i.e. a piece of grass with soil – held together by the roots) which has been cut from an area covered with grass (sward)
- Generally cool season grasses are established only by seed propagation

- As part of maintaining a grassed area, it is important to understand grass growth.
- Creeping-type grasses are known for their creeping growth habit
 - These grasses are spread by stems that stretch out from the crown of the plant
 - New shoots develop from nodes on either:
 - Underground stems (rhizomes), or
 - Horizontally growing aboveground stems (stolons)



St. Augustinegrass is a creeping-type grass that is spread by thick stolons

Grassed areas

- Different grasses spread in different ways:

Grasses spread by rhizomes	Grasses spread by stolons	Grasses spread by both stolons and rhizomes
• Kentucky Bluegrass • Fine Fescue (some varieties)	• Buffalograss • Creeping Bentgrass • St. Augustinegrass	• Axonopus compressus • Blue Couch • Bermudagrass • Colonial Bentgrass • Kikuyu • Sir Walter Buffalo • Tifdwarf • Zoysia

Note: All warm season grasses have stolons and/or rhizomes

- To prepare for grassed area maintenance, you should familiarise yourself with the following:
 - Task requirements
 - Refer to enterprise maintenance schedules and work instructions
 - Speak to your supervisor
 - Apply active listening when receiving instructions
 - Clarify any unclear instructions with your supervisor
 - Document and present priorities and time allocation for tasks for verification
 - Requirements for particular turf types
 - Reports (e.g. about turf health, soil test results)
 - Documentation from turf providers

- To prepare for grassed area maintenance, you should familiarise yourself with the following:
 - Laws applicable to your workplace
 - Acts
 - *Work Health and Safety Act 2011 (Qld)* which outlines employers' and employees' safety responsibilities
 - Regulations
 - *Work Health and Safety Regulation 2011 (Qld)* which addresses the handling of hazardous substances.
 - Codes of practice
 - *Labelling of Workplace Hazardous Chemicals Code of Practice 2011* which outlines the types of information needed on chemical labels so that hazards are easily identified
 - *Managing risks of hazardous chemicals in the workplace Code of Practice 2013* which describes the types of labels that may be present on chemical treatments

- To prepare for grassed area maintenance, you should familiarise yourself with the following:
 - **Work area**
 - Identify any WHS hazards and assess risks (e.g. manual handling injuries, injuries from machinery/tools/equipment, chemical exposure)
 - Identify environmental impacts (e.g. damage to flora/fauna, waste, chemical spills/drift, over-fertilisation, noise/dust pollution, leaching into water table)
 - Report hazards to your supervisor within a timely fashion – especially emergency situations

Assess risks by developing a Job Safety Analysis (JSA) or Safe Work Method Statement (SWMS)

Workplace risk assessment

- Risk is measured in terms of the seriousness of the possible **consequences** of the hazard and the **likelihood** that those consequences will occur, as in the matrix shown below:

Likelihood

- 1: Very Likely
- 2: Likely
- 3: Possible
- 4: Unlikely
- 5: Very Unlikely

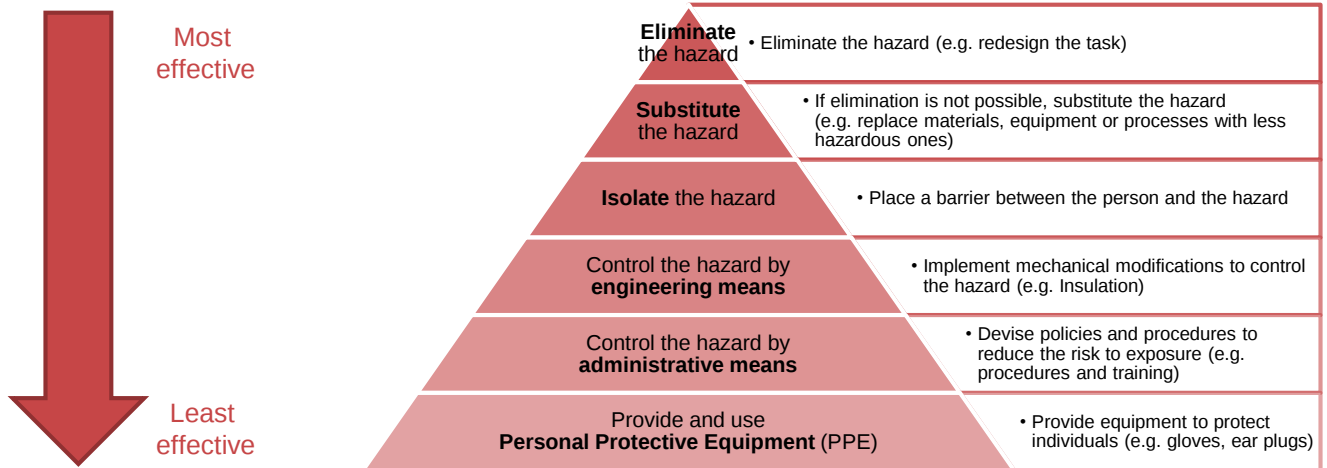
Consequences

- A: Death or Permanent Disability
- B: Serious Injury
- C: Lost Time Injury
- D: Casualty Treatment
- E: First Aid

Matrix	A	B	C	D	E
1	E	E	H	H	M
2	E	H	H	M	M
3	H	H	M	M	L
4	H	M	M	L	L
5	M	M	L	L	L

Workplace risk control

- The hierarchy of control gives priority to the order in which hazard and risk controls should be implemented.



- To prepare for grassed area maintenance, you should familiarise yourself with the following:
 - Available PPE, machinery, equipment, tools and materials
 - PPE may include: Gloves, goggles, gumboots, long sleeved shirt, long trousers, waders, wide brimmed hat, work boots
 - Machinery and equipment may include: Boom spray, sorer, mower (cylinder or rotary), fertiliser spreader, line edger, quad bike/buggy, scarifier, skid steer, spray equipment, tractor, turf cutter, vacuum/blower
 - Tools may include: Core sampler, fork, funnel, hand weeder, hoe, hose, irrigation components/systems, leveller, marking paint, mattock, rake, shovel, spanner, stringline,
 - Materials may include: Fertiliser, fuel, grease, herbicide, oil, pesticide, sand, sandy loam, seeds/sprigs/sods, water
 - Ensure they are appropriately selected, prepared and used for the task, following manufacturer recommendations and enterprise work procedures

Maintaining grassed areas

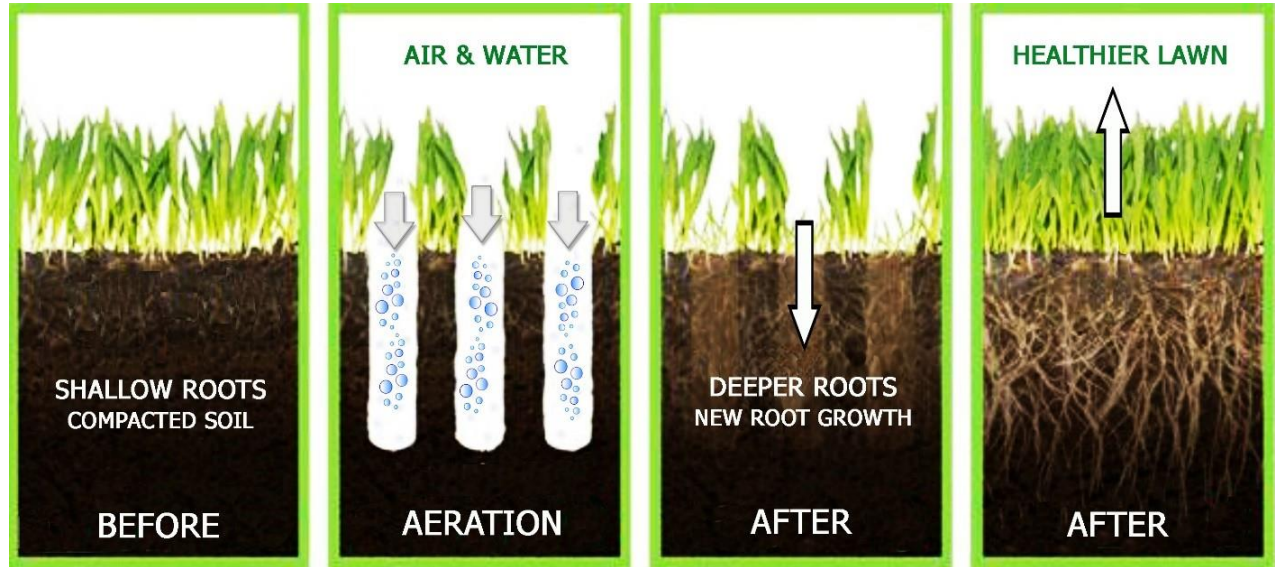
- The maintenance requirements for grassed areas will vary, depending on the type of grass that has been planted.
- Activities that are generally undertaken as part of a grassed area maintenance program include:

Task	Definition
Aeration	Creating openings in the grassed area to help air, water and nutrients move into the soil to the grass roots, alleviate soil compaction and help reduce thatch
Fertilising	Provides food to grassed areas to retain good health and colour
Mowing / trimming	Levelling or cutting down grass and trimming edges
Top dressing	Spreading sand or sandy loam over grassed area to boost nutrients or repair holes/ uneven lawns
Pest, disease and disorder control	Using biological, chemical, cultural, genetic, mechanical or physical control methods
Irrigation system repair	Undertaking required repairs and other maintenance/service/replacements

- Aeration is the process of creating openings in the grassed area to help air, water and nutrients move into the soil to the grass roots, alleviate soil compaction and help reduce thatch.
- An aerator pulls plugs out of the soil – coring, spiking or slicing into the soil:
 - Coring removes columns of soil using hollow tubes
 - Spiking uses solid tines to create holes in the soil
 - Slicing/scarifying uses rotating blades to cut narrow slits into the soil

Aeration

- The process of aeration:



- The fertiliser required will depend on the soil nutrient and pH needs

Lower soil pH	Raise soil pH
• Acidic fertiliser (e.g. containing ammonium sulfate, or sulphur-coated urea) • Elemental sulphur (Flakes of sulphur), needs to be broken down by soil bacteria to be available for plant uptake • Apply at 35g/m² on soils with sandy structure • Apply at 100g/m² on clay soils • Manure (i.e. from poultry, cows, horses and sheep)	• Agricultural lime (Calcium carbonate), a finely ground limestone which is untreated • Hydrated/slaked lime (Calcium hydroxide), which is more soluble and faster acting than agricultural lime • Dolomite (Calcium magnesium carbonate), which contains more magnesium than agricultural lime • Quick lime (Calcium oxide), but not for garden use

Fertilising

- The fertiliser required will depend on the soil nutrient and pH needs

Element	Symptoms of deficiency
Nitrogen	• Pale grass • Reduced grass density • Slow growth • Weed invasion
Phosphorus	• Reduced root growth • Reduced shoot growth
Potassium	• Decreased tolerance to disease and drought • Reduced shoot length • Reduced root growth • Yellowing older leaves
Iron	• Yellowing and chlorosis • Reduced root growth

Fertilising

- The fertiliser required will depend on the soil nutrients and pH requirements
- There are a range of methods of applying fertiliser:

Type	Description
Banding	If subsurface, it is applied below the soil surface close to the seed row
Broadcasting	Uniform application of fertiliser by hand or mechanically
Fertigation	The injection of fertiliser, soil amendments and other water-soluble products into an irrigation system
Ripping	Loosening the soil by tillage

- Consider the fertiliser and soil type when selecting a method

- Most grasses have a range of recommended mowing heights
 - As a general rule, warm season grasses can be mowed lower than cool season grasses

Grass type	Mowing height	Grass type	Mowing height
Blanket/Carpet grass (<i>Axonopus compressus</i>)	30-50mm	Kentucky Bluegrass (<i>Poa pratensis</i>)	40-65mm
Blue Couch (<i>Digitaria didactyla</i>)	12-30mm (Average 12mm)	Kikuyu (<i>Pennisetum clandestinum</i>)	30-50mm
Colonial Bentgrass (<i>Agrostis spp</i>)	6-25mm	Sir Walter Buffalo (<i>Stenotaphrum secundatum</i>)	30-50mm
Creeping Bentgrass (<i>Agrostis spp</i>)	6-25mm	Tifdwarf (<i>Cynodon dactylon</i>)	15-30mm
Fine Fescue (<i>Festuca spp</i>)	35-60mm	Zoysia (<i>Zoysia japonica</i>)	12-35mm

Top dressing

- Top dressing should only occur during the growing season (i.e. late spring to early summer)
- Never top dress more than 1cm in a single application, making sure the grass tips are still exposed
- Be sure to properly water the sand/soil during the application to wash it into/between the small spaces in the grassed area
- Fertilise a few weeks prior to top dressing to ensure maximum growth

Well-fertilised grass that is healthy and even may not need top dressing

- General pests that may affect grassed areas include:

General pests	Weeds
• Ants • Army worms • Black beetles • Earthworms	• Crows foot (<i>Eluesine indica</i>) • Mullumbimby couch (<i>Cyperus brevifolius</i>) • Nutgrass (<i>Cyperus rotundus</i>) • Winter grass (<i>Poa annua</i>) • Summer grass (<i>Digitaria sanguinalis</i>)

- There are a range of different treatment options to control pests, diseases and disorders, including:
 - **Cultural**
 - Involves manipulating farming practices to suppress pests/diseases/disorders, while promoting plant development
 - **Biological**
 - Makes use of the pest/disease's naturally occurring enemies, such as insects and pathogens (e.g. fungi and bacteria)
 - **Chemical methods**
 - Herbicides: Used to kill unwanted plants
 - Pre-emergent herbicides stop young weeds before they have the ability to flower and seed. Thus, less chemical are required and less labour to control weeds that have established.
 - Insecticide: Use for killing insects
 - Pesticide: Used to attract and then destroy/mitigate pests

- There are a range of different treatment options to control pests, diseases and disorders, including:
 - Genetic
 - Planting pest-resistant varieties
 - Mechanical
 - Includes the use of covers/screens and vacuums
 - Physical
 - Includes hand weeding, slashing, burning, cutting, ripping

- An irrigation system is a system of components which supplies and distributes water.
- This includes micro-irrigation systems and spray irrigation systems
 - Systems range from manual operation and monitoring to fully automated with computer control and monitoring

Micro-irrigation systems may include	Spray irrigation systems may include
• Mains pressure • Low pressure • Below or above ground • Sprays systems • Drip emitter trickle • T-tape • Mini-sprinklers • Capillary pop ups • Gear driven sprinklers	• Travelling irrigators (soft hose, hard hose boom type) • Centre pivot • Linear move • Powered side roll hand shift permanent (installed) • Bike shift/easy shift

- A pressurised irrigation system consists of many components, including:

Equipment	Definition
Drip tape	Water distribution system that operates at very low pressure.
Emitter	Two main types: Allow water to seep into the root zone or direct water into the air. Includes pop-up sprinklers.
Filter	Removes debris from systems.
Fittings	Used to join pipes together. Poly fittings have barbed ends which are pushed into the pipes to connect them together.
Gate valve	Used primarily as a shut-off valve, as opposed to flow control.
Master valve	Ensures that at the end of the watering cycle the water is turned off at a central valve.
Poly pipe	Provides an outlet for water to travel through.
Pump	Deliver waters to irrigation system.

- Between seasons, a range of problems may affect a pressured irrigation system, including:
 - Damage to poly pipe or sprinklers
 - Mulch and vegetation covering sprinklers and valve boxes
 - Ants and dirt blocking sprinkler heads
- As part of pre-season checks, you will rectify such problems
 - Cleaning filters using chlorine
 - Removing mulch using gardening gloves
 - Trimming small branches and weeds using secateurs

- To reduce the amount of work required at a pre-season check, you should maintain the system post-season.
- This may include tasks such as:
 - Flushing the system
 - Cleaning the system
 - Closing down the system
 - Undertaking required repairs and other maintenance/service/replacements

- To determine if a pressurised irrigation system is performing well, measure and calculate the water output and distribution
 - Remember that friction between the moving stream of water in the internal walls of the pipes and fittings causes pressure loss as water moves through the system
- When visually inspecting an irrigation system, check for leaks, operating faults and dry areas.

- To test an irrigation system, undertake the following steps:
 - Open the furthestmost solenoid valve
 - Open the main valve
 - Allow the system to run until the water is clear
 - Turn off the furthestmost solenoid
 - Check for leaks along the mainline, especially around control valves
 - Leave joints exposed until pressure tested
 - Turn off main valve
 - Turn on each station individually using the controller

- Items that are commonly replaced due to wear or blockage include:
 - Drip line tapes
 - Emitters
 - Filters
 - Outlets
 - Pump screens
 - Sprinklers
 - Strainers

Ratchet clips are the most commonly replaced components of pressurised irrigation systems

- To maintain pop-up sprinklers, complete the following:
 - Remove nozzle and insert flushing cap
 - Dig a hole around the sprinkler to provide working room
 - Unscrew pop-up and unscrew riser
 - Turn on the system to flush pipes
 - Reattach riser
 - Open flushing driver and flush system again
 - Replace filter
 - Clean and reattach nozzle

- To repair a poly pipe, complete the following:
 - Isolate the system
 - Locate the hole in the pipe
 - Dig a hole around the pipe to provide working room
 - Cut out the damaged section of pipe
 - Reconnect the cut pipes using joiners and clamps/clips
 - Test joint for leaks

- You will not always be able to undertake repairs yourself.
 - You may need to record and report damaged or faulty items, such as:
 - Pumps
 - Valves
 - Electrical components
 - Computer systems

- There may be times that you encounter grassed areas that require specialist attention
 - Refer to your supervisor in the first instance for guidance
 - You may be required to organise additional assistance
 - For example: Referring unknown weeds to a horticulturalist for identification and advice on control methods
- Other issues may arise where a contingency plan is required (e.g. pest treatments do not work)
 - Report these to your supervisor
 - Take corrective actions according to enterprise guidelines

- When undertaking grass maintenance tasks, you will likely be working as part of a team (e.g. co-workers, consultants)
- Observe the following tips regarding teamwork:
 - Use clear language and concepts (verbal and non-verbal)
 - Consider the varying cultural and ethnic backgrounds of your co-workers
 - Consider the message you are communicating and the best method to communicate it (e.g. written, verbal)
 - Consider the abilities of your co-workers
 - Coordinate tasks sequentially, timely and effectively according to a schedule
 - Coordinate resource delivery and timing of tasks according to workplace priorities, ensuring materials are delivered to site as they are required

- As part of finalisation processes, you should:
 - Shut down, maintain, clean and store machinery, tools and equipment according to manufacturer's specifications
 - Report identified hazards and faults
 - Machinery operators should be made aware of their responsibilities with respect to maintenance of machinery and equipment

- As part of finalisation processes, you should:
 - Store chemicals
 - Follow Safety Data Sheet (SDS) requirements
 - Ensure chemicals and fuels are not stored together, as this may cause explosions
 - Ensure the storage area is well-ventilated to avoid the build up of fumes and gases
 - Lock up the storage area to avoid access by unauthorised persons

- As part of finalisation processes, you should:
 - **Dispose of materials that cannot be reused or recycled**
 - Ensure you implement environmentally safe practices
 - Follow Safety Data Sheet (SDS) requirements
 - **Prepare written reports to management of maintenance activities undertaken**
 - Note personnel (including specialists), activities, timelines and materials usage on appropriate paperwork
 - Document results clearly and concisely

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