Stage 5 – Agricultural Technology – summer crops and tractor operation

## Summary

Summer crops and tractor operation gives students the opportunity to learn about tractor and machinery safety and driving through the establishment and maintenance of a summer crop. Students learn about the parts and controls on tractors and safe operating procedures while preparing seed beds, applying fertilisers and maintaining a crop through to harvest.

## Duration

Sample term - 10 weeks

Detail: 25 hours, 5 (1 hour) lessons a cycle

## Outcomes

* **AG5-3** explains the interactions within and between the agricultural sector and Australia’s economy, culture and society
* **AG5-4** investigates and implements responsible production systems for plant and animal enterprises
* **AG5-5** investigates and applies responsible marketing principles and processes
* **AG5-6** explains and evaluates the impact of management decisions on plant production enterprises
* **AG5-8** evaluates the impact of past and current agricultural practices on agricultural sustainability
* **AG5-11** designs, undertakes, analyses and evaluates experiments and investigates problems in agricultural contexts
* **AG5-12** collects and analyses agricultural data and communicates results using a range of technologies
* **AG5-13** applies Work Health and Safety requirements when using, maintaining and storing chemicals, tools and agricultural machinery
* **AG5-14** demonstrates plant and/or animal management practices safely and in collaboration with others

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## Unit overview

Students will develop knowledge and understanding of agricultural enterprises and the practices and skills required to produce summer crops. Students will be involved in tractor safety training and driving instruction lessons at an introductory level. Students will use their tractor driving skills to prepare the ground for a summer crop, maintaining the crop and harvesting the product.

As part of this unit, students will undertake a range of practical tasks, including, but not limited to:

* Seed bed preparation
* Cultivation
* Sowing
* Fertiliser use
* Irrigating
* Pest and disease prevention
* Cleaning and securely storing machinery

## Resources overview

The resources and links listed below are referenced within the program but is not an exhaustive list of resources available. Teachers can add to these resources as needed.

###  Physical resources

* Tractor operators manual
* Guide to safe use of tractors: WorkCover Authority of New South Wales
* Yates Garden Guide
* Sweet corn packet, Yates
* Instructor tractor safety booklet
* Student tractor work booklet
* Student tractor operations booklet
* Tractor resource booklet
* Sweet corn resource booklet

### Websites

* Farmsafe Australia Inc. [farmsafe.org.au](http://www.farmsafe.org.au/)
* The University of Sydney. Safe Tractor Operations A Practical Guide [farmsafe.org.au/Resources-for-Farmers](https://www.farmsafe.org.au/Resources-for-Farmers)

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| **Content** | **Teaching and learning** | **Evidence of learning** | Adjustments and registration |
| **Weeks one and two*** Identify and apply ethical and WHS practices (ACTDEP050)
 | **Teacher**:* Discuss the importance of farm and machinery safety.
* Introduce students to the school tractor. Identify the safety aspects of the machine; including ROPS, safety triangle and guards.

**Teacher and students:*** Identify and familiarise parts and controls of the school tractor.
* Identify make, model, engine capacity, and other features of the school tractor.
* Identify the personal protective equipment (PPE) for use in driving tractor.
* Identify the safety decals of the tractor, caution, warning and danger.
* **Students**:
* Complete the relevant sections in the student tractor operations booklet.
 | * Students demonstrate prior knowledge by being able to identify safe farm and machinery behaviour and rules.
* Students identify and verbally name parts and controls of the school tractor.
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| **Week three*** Identify and apply ethical and WHS practices (ACTDEP050)
 | **Teacher:*** Conduct pre start procedures on the tractor.
* Discuss the function of gears and levers.
* Examine students on identifying parts and controls of the tractor.
* Introduce students to starting and stopping tractor. This may include questioning of students’ knowledge of PPE and tractor pre start checks.
* Introduce students to tractor hand signals.

**Students/Practical:*** Start and stop the tractor and become familiar with controls under teacher supervision.

**Students:*** Complete the relevant sections in the student tractor operations booklet.
 | * Students are able to identify the controls used in starting and stopping the school tractor.
* Students start and stop the tractor under direct teacher supervision.
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| **Weeks four and five*** Identify and apply ethical and WHS practices (ACTDEP050)
 | **Teacher and students/practical:*** Complete tractor driving skill test in ‘open space’; 50 metres x 50 metres. Ensure departmental protocols are followed for this activity.

**Students:*** Complete a tractor driving examination.
 | * Students accurately complete the tractor driving examination.
* Students are observed during practical driving skills test following correct procedures and safety requirements.
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| **Week six*** Identify and apply ethical and WHS practices (ACTDEP050)
 | **Teacher and students:** * Identify the implements owned by the school.
* Identify the purpose of each implement and the risks associated with their use.

**Students:*** Complete tasks to identify the safe operating procedures for each implement.
 | * Students are able to articulate the purpose and risks associated with a range of implements.
* Students complete tasks identifying safe operating procedures for school tractor implements.
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| **Week seven*** Identify plants relevant to agricultural production
* Plan and undertake procedures in the management of a plant enterprise (ACTDEP048)
* Manage and monitor crops to raise/grow products on the school farm
 | **Teacher:*** Select a summer crop suitable for the local area to be planted.

**Students:*** Research aspects of the summer crop enterprise including, soil preparation, fertiliser application, planting information, irrigation methods used, anatomy of the crop and marketing.
* Complete the relevant sections in the student tractor operations booklet.
 | * Students research and record information that will assist in successfully planting and maintaining the chosen summer crop.
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| **Week eight*** Implement soil-management operations for a chosen plant enterprise (ACTDEK046)
* Investigate and analyse soil quality indicators, e.g. soil texture, structure, pH and soil profiles
 | **Teacher and students/practical:*** Under teacher supervision, prepare an area for the summer crop using the tractor and rotary tiller.
* Example: Form x 4 ‘Hills’: 300mm high x 400mm wide x 20 meters. Row spacing 600mm. Use tape measure, pegs, string and garden equipment to form the ‘hills’.

**Students/practical:*** Complete a pH test of the soil and add lime fertiliser if required.
 | * Students are observed safely following instructions to prepare soil for planting.
* Students are observed safely and accurately completing a field pH soil test.
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| **Week nine*** Plan and undertake procedures in the management of a plant enterprise (ACTDEP048)
* Manage and monitor crops to raise/grow products on the school farm
 | **Teacher and students/practical:*** Under teacher direction, deep band the selected fertiliser, 100mm below seed.
* Use a ‘spacer stick’ marked at 300mm intervals for seed sowing. Sow seed to recommended depths.
 | * Students are observed safely following instructions to apply selected fertiliser to soil and planting seed.
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| **Week ten*** Plan and undertake procedures in the management of a plant enterprise (ACTDEP048)
* Manage and monitor crops to raise/grow products on the school farm
 | **Teacher and students/practical:** * Establish an irrigation system applicable to the area.
* Depending on site location, use an electric fence to restrict animal encroachment onto summer crop.
* Harvesting of the summer crop will occur in mid-term of the following year.
 | * Students are observed safely following instructions to establish irrigation for the crop.
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## Evaluation

Evaluation of learning activities should be an ongoing process that happens throughout the delivery of this unit. Teachers should document their evaluation of learning activities throughout the program. The space provided below is to evaluate the overall unit of work.

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