



Stage 5 Agricultural Technology

Course plan

Rationale

Inverell High School has a diverse range of students, drawing from both town and country areas. This Agricultural Technology course plan has been developed to meet the requirements of all students.

The study of Agricultural Technology develops knowledge and understanding about a range of agricultural practices. It develops the ability to respond to human needs and emerging opportunities. It develops knowledge, understanding and skills in the management of plant and animal enterprises, the technology associated with these enterprises and the marketing of products.

Inverell High has access to a wide range of resources:

- on the school farm
- in the community
- staff expertise.

The enterprises chosen take full advantage of these valuable resources. Consideration was also given to choosing regionally significant enterprises that contribute to both the local and Australian economy such as *Beef*, *Wool*, *Nursery plant production* and *Wheat* as well as 'alternative' enterprises such as *Olives*, *Rabbits*, *Growing plants hydroponically* and *Worms*. Topics such as *Pastures (Lucerne)* and *Summer Crops (Forage Sorghum)* were chosen as they are the 'backbone' of the beef and wool enterprises.

Each enterprise will be viewed holistically, however, by simultaneously highlighting some of the important interactions within the enterprise and with other relevant enterprises this will demonstrate the typically integrated nature of agriculture.

The 10 topics listed above were selected due to the diversity of agriculture in this area.

The syllabus outcomes will therefore be addressed across a range of enterprises, reinforcing concepts, building on prior learning and emphasising both the differences and similarities between production systems. By progressing through the course, students will gain a more sophisticated, deep understanding of the concepts and skills as they will be studied in greater depth each time.

The enterprise progression and sequencing is determined by a number of factors:

- the time of the year when the majority of management operations are performed for each enterprise
- seasonal nature of the enterprises
- cattle show and competitions calendar
- holiday periods.

Enterprises such as *Beef cattle*, *Wheat* and *Sheep (Wool)* are spread across several terms, allowing for the study of the relevant management activities, growth and development and opportunities for practical work to take place when each enterprise demands it.



Course overview

At Inverell High School, it is expected that most students will study 200 hours of Agricultural Technology. Some students elect to drop Agriculture after 100 hours in Year 9 to complete a Work Studies program. Students are not usually permitted to join Agriculture at the start of year 10, unless under special circumstances such as moving to Inverell and having done 100 hours of Year 9 Agriculture at their previous school.

Syllabus requirements

The 10 enterprises include examples of intensive and extensive production systems, covering a range of both plant and animals. Practical experiences will make up a minimum of 50% of the course time. All enterprises will be studied with reference to: interactions, management and sustainability.

IHS runs on a two-week cycle with five one-hour periods per two-week cycle in Years 9 and 10.

Enterprises range from 10 to 30 one-hour periods (see below).

Year 9 enterprises

	Hours	Weeks
1. Beef cattle	30	12
2. Worms	10	4
3. Winter crops (Wheat)	25	10
4. Growing plants hydroponically	20	8
5. Summer crops (Forage Sorghum)	15 (+ 5 in Yr10)	6 (+ 2 in Yr10)
	100	40

Year 10 enterprises

	Hours	Weeks
5. Crops (Forage Sorghum) continued	5	2
6. Rabbits	12	4–5
7. Pastures (Lucerne)	26	11
8. Sheep (Wool)	25	10
9. Nursery Plant Production	20	8
10. Olives	12	4–5
	100	40



Assessment

Students will be provided with the opportunity to demonstrate their learning in everyday classroom activities as well as planned assessment events.

Assessment for each topic will be balanced between theory and practical work, employing a range of strategies ensuring that information is being gathered regarding the knowledge and understanding that is being acquired, and the skills that are being developed.

Assessment strategies may include:

- Topic tests
- Practical tests
- Plant and animal husbandry skills
- Practical work / reports
- Experimental work
- Research assignments and projects
- Peer assessment

Feedback on assessment will be both formal and informal.



Enterprise outcomes grid preamble

Several outcomes, *learn abouts* and *learn tos* have been split up and placed into different enterprises. To differentiate between these dot points, I have labelled them a. b. c. d. etc in order from the first to the last. An example is given below.

Outcomes	Students learn about:	Students learn to:
A student:		
5.1.1 explains why identified plant species and animal breeds have been used in agricultural enterprises and developed for the Australian environment and/or markets	a. animal breeds/plant species specific to chosen agricultural enterprises b. climatic factors affecting plant and animal production including: – humidity – solar radiation – wind patterns – temperature – rainfall c. the impacts of a range of cultures including Aboriginal cultures on Australian agricultural production	a. identify the characteristics of animal breeds and plant varieties specific to chosen enterprises b. measure and assess climatic factors affecting plant and animal production c. tabulate and graph climatic conditions in the local region relative to a chosen enterprise d. identify some impacts of range of cultures including Aboriginal cultures on Australian agricultural production

Unit of work	Outcome: 5.1.1	
	Learn about (LA)	Learn to (LT)
Beef cattle	a. b.	a. b.
Worms	a. b.	a. b. c.
Wheat	c.	c. d.
Growing plants hydroponically		
Summer crops		

The enterprise outcomes grid therefore illustrates how certain outcomes are addressed in each enterprise. Not all outcomes are appropriate for all enterprises and some will be addressed across a number of enterprises.



Year 9

1. Beef cattle

Outcomes	Key concepts	Practical activities	Technologies
5.1.1 LA a. b LT a. b. 5.1.2 LA a. LT a. b. 5.2.1 LA a. b. c. d LT a. b. 5.3.1 LA a. b LT a. b. 5.3.4 LA a. b. c. e. f. j. LT a. b. c. d. e. f. 5.4.2 LA b. c. d. LT a. b. c. 5.4.3 LA a. LT a. b. 5.5.2 LA a. LT a. b. c. 5.6.1 LA b. LT b. c. 5.6.2 LA a. LT a. b.	Breeds Basic requirements – nutrition Climate / limiting factors – distribution Ruminant digestion Reproduction Calendar of operations Husbandry techniques Pests and diseases Interactions Aust. economy, culture, society Employment opportunities Animal behaviour Intensive v's extensive Social/ethical issues – Feedlot Animal welfare Marketing – domestic and export	Muster and move. Set up yards and move cattle through. Catch cattle in crush. Put halter on. Tie up and lead. Parade a steer in show setting. Wash and groom. Pack show box. Judge live animals – live appraisal (fat and muscle score). Feed cattle. Monitor health. Check water. Monitor and record growth. Drench/backline. Estimate weight. Set up scales and weigh. Excursion: saleyards.	Artificial insemination (AI) Embryo transfer NLIS Ultra sound fat scanning Cloning Estimated breeding values (EBV) Nutritional technology Internet marketing feedback

2. Worms

Outcomes	Key concepts	Practical activities	Technologies
5.1.1 LA a. b. LT a. b. c. 5.1.2 LA a. LT a. b. 5.2.1 LT a. 5.3.1 LA a. b. LT a. b. 5.3.2 LA b. LT b. c. 5.3.4 LA a. b. c. d. g. i. LT a. b. f. 5.4.2 LA a. b. c. LT c. 5.5.1 LA a. LT b. 5.6.2 LA a. LT a. b.	Breeds Basic requirements – nutrition Monogastric digestive system Reproduction Husbandry techniques Climate/limiting factors Intensive production Production cycle Pest control Interactions Markets Social/ethical issues Experimental design and analysis	Establish and maintain a worm farm. Select breed and number. Feed worms. Measure pH, temperature of bedding material. Water worms when necessary. Identify mating worms. Identify worm capsules/eggs. Experiment: food preferences. bedding preferences covering materials. Excursion: two different worm farms with two distinct markets	Full nutrient analysis – Quality assurance. Random analysis – heavy metals, pesticide residues. Multi-filter system – prevent boom spray blockages.



3. Winter crops (Wheat)

Outcomes	Key concepts	Practical activities	Technologies
5.1.1 LA a. b. c LT a. b. c. d. 5.3.2 LA a. b. c. LT a. b. c. 5.3.3 LA a. c. d. LT a. b. c. d. e. g. 5.3.4 LA f. h. LT e. 5.4.1 LA a. LT a. b. 5.6.1 LA c. LT c.	Types, varieties and uses Structure, function and reproduction Photosynthesis Production cycle Stages of growth Climate/limiting factors – distribution Soils Pests and diseases Calendar of operations Aboriginal/European land use Sustainability Cultural Influences, incl. Aborig. Markets and marketing – specifications and export OHS	Grow and monitor a wheat crop. Collect, press, present plants at different stages of growth. Harvest a wheat crop. Soil tests – pH, texture, colour. Identify a range of cereal plants, seeds and fertilizers. Identify a range of weeds (plant collection). Identify machinery. Excursion: local machinery dealer (demonstration of machinery technologies). Hazard identification and risk assessment of tractor and machinery.	GPS Machinery Satellite imagery Refractometer (Brix meter) Leaf analysis Soil testing Foliar fertiliser application Australian Rainman CD Decision Support Tools – University of New England (UNE)

4. Growing plants hydroponically

Outcomes	Key concepts	Practical activities	Technologies
5.3.1 LA a. b. LT a. b. 5.3.3 LA a. b. LT a. b. d. e. 5.3.4 LA i. 5.6.1 LA a. LT a. b. 5.5.1 LA a. LT a. 5.6.1 LA a. LT a. 5.6.2 LA a. LT a. b.	Plant structure and function Basic requirements – nutrition Climate/limiting factors Types of systems: adv/disadv Management techniques Pests and diseases Intensive production Chemical use, storage, safety	Establish and maintain a small scale hydroponic system. Select growing medium. Select and transplant seedlings. Mix up nutrient solution and apply when necessary. Evaluate the efficiency of the system and make recommended changes. Harvest plant produce. Identify plant parts and function. Measure pH, temperature of growing medium. Monitor the rainfall and air temperature over the growing period. Read a chemical label. Use and store chemicals safely.	Genetically engineered species Nutrient solution - quality, flow regulation methods



5. Summer crops (Forage Sorghum) continued for 2 weeks in year 10

Outcomes	Key concepts	Practical activities	Technologies
5.3.3 LT f. 5.4.1 LA a. b. c. LT a. b. c. 5.4.2 LA a. 5.5.1 LA a. LT a. b. c. d. 5.6.1 LA c. d.	Soil: structure, texture, pH, profiles Land degradation Aboriginal/European land use Sustainability Experimental design and analysis (1st hand investigation – fert. trial) OHS	Prepare soil for sowing of summer crop. Determine pH, temperature, texture and structure of soil. Experiment: fertiliser trial density trial. Hazard identification and risk assessment of tractor and machinery. Examine photos, pictures of land degradation. Excursion: local degradation sites.	Leaf analysis GPS Machinery Satellite imagery Refractometer (Brix meter) Soil testing Australian Rainman CD Decision support tools (UNE) Foliar fertiliser application



Year 10

6. Rabbits

Outcomes	Key concepts	Practical activities	Technologies
5.1.1 LT c. 5.1.2 LA a. LT a. 5.3.1 LA a. b. LT a. b. 5.3.4 LA a. b. c. LT a. b. c. d. 5.4.3 LA a.	Breeds Micro-organisms and invertebrates Pests and diseases Types of production systems Reproduction/breeding techniques Basic requirements – nutrition Husbandry techniques Animal welfare	Establish and maintain a small scale rabbit farm. Select breed and number. Feed rabbits. Water rabbits. Identify male and female rabbits. Excursion: local rabbit farm.	Housing systems Disease control

7. Pastures (Lucerne)

Outcomes	Key concepts	Practical activities	Technologies
5.1.2 LA a. LT a. 5.3.1 LA a. b. LT a. b. 5.3.3 LA a. c. LT a. c. d. 5.4.1 LA a. LT a. 5.4.2 LA a. LT a.	Importance Types, uses Microbes and invertebrates Soils – texture, structure Grasses and legumes Native and introduced Grazing strategies Seasonality of growth Sustainability Land degradation Extensive production	Grow and monitor a pasture. Collect, press, present plants at different stages of growth. Identify a range of pasture plants – grasses and legumes – native and introduced species. Identify a range of pasture seeds and fertilizers. Soil tests – pH, texture, structure. Compare soil structure under long term pasture and a cultivated paddock. Set up and move livestock through different grazing systems. Identify a range of weeds. Identify machinery. Inoculate and lime pellet seed	Resistant varieties – breeding GPS Machinery Satellite imagery Refractometer (Brix meter) Leaf analysis Soil testing Moisture meter Foliar fertiliser application Bloat prevention methods Australian Rainman CD Decision support tools (UNE)



8. Sheep (Wool)

Outcomes	Key concepts	Practical activities	Technologies
5.5.1 LA a. b. LT a. 5.2.1 LA a. LT a. b. 5.3.2 LA a. b. c. LT a. b. c. d. 5.3.4 LA a. b. c. LT a. b. c. d. 5.4.2 LA b. LT b. 5.4.3 LA a. LT a. 5.5.1 LT a. b. 5.5.2 LA a. LT a. b. 5.6.1 LA a. LT a. 5.6.2 LA a. LT a.	Breeds Basic requirements – nutrition Climate/limiting factors – distribution Breeding program – reproduction Wool industry Calendar of operations Husbandry techniques Employment opportunities Social/ethical issues Animal welfare Marketing – requirements, appraisal, techniques – domestic and export OHS	Muster and move. Set up yards and move sheep through. Draft sheep. Catch, tip and hold sheep. Identify external features. Feed sheep. Determine age by mouthing. Pick up and hold lambs. Carry out marking duties. Tag sheep. Monitor health. Check water. Monitor and record growth. Drench. Estimate weight. Set up scales and weigh. Condition score. Hazard identification and risk assessment of yards.	Decision support tools (UNE) Chemical shearing On farm fibre testing kit AI Ultra sound Cloning Pest and disease control methods Nutritional technology Internet marketing feedback

9. Nursery plant production

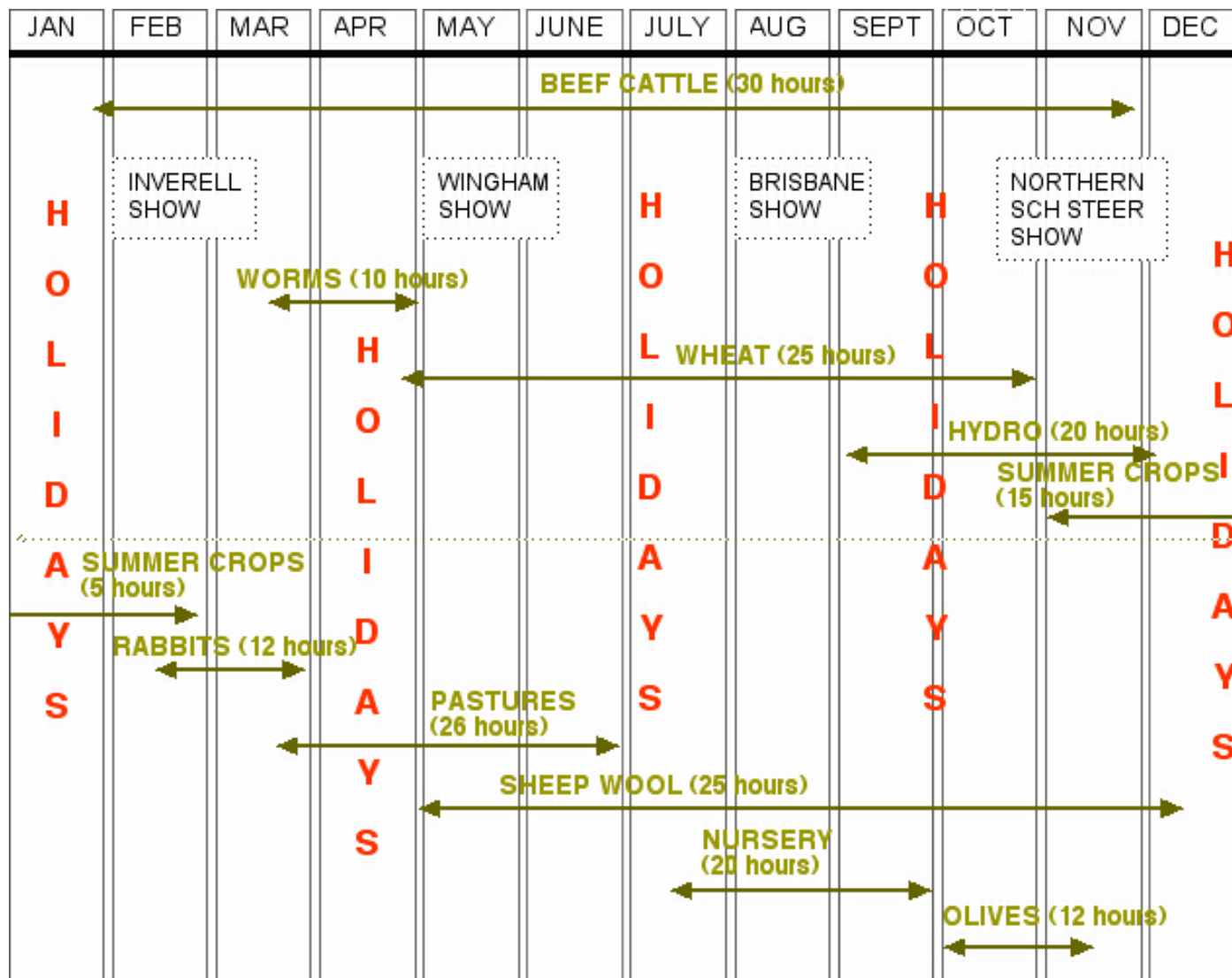
Outcomes	Key concepts	Practical activities	Technologies
5.2.1 LA a. 5.3.3 LA b. LT b. 5.4.2 LA a. LT a. 5.5.1 LA a. LT a. b. 5.6.1 LA a. LT a. 5.6.2 LA a. LT a.	Types Sexual and asexual reproduction Propagation techniques Greenhouse design Experimental design and analysis Markets OHS – hazard identification and risk assessment	Identify plants that reproduce sexually and asexually. Carry out different propagation techniques: – seedlings – cuttings – grafting – layering – budding. Experiment: comparing different rooting hormones/products. Excursion: State Forestry Nursery	Tissue culture Propagating media and techniques Hormones



10. Olives

Outcomes	Key concepts	Practical activities	Technologies
5.1.1 LA a. b. LT a. b. c. 5.2.1 LA a. LT b. 5.3.2 LA a. b. c. LT a. b. c. d.	Varieties and uses Production cycle Husbandry techniques Value adding Marketing – requirements, appraisal, techniques – domestic and export	Grow and monitor olive trees. Prune olive trees. Excursion: Olive farm and factory. Examine husbandry harvesting and techniques. Taste testing – different oil and olive varieties.	Variety – breeding Propagation methods Harvesting methods

Years 9 and 10 overview



* The four cattle shows indicated may not all be attended in any one year.