Agricultural Science

Agricultural Science explores the ways people sustainably manage natural resources such as plants, animals, climate, soil and water to meet their basic needs. These management practices derive from current understandings about science, food and fibre production systems, sustainable farming practices, agricultural technologies, consumer-driven economics and effective product marketing. Because Agriculture is of fundamental importance to humans, the subject is highly relevant to all students, not just those from a rural background. The subject is especially useful to those students seeking a successful career in Agriculture as a specialist, agribusiness or simply wanting a career on the land.

Semester 1 (Yr11) Livestock Production

Animal Production Systems
- Intensive and extensive production systems
- Production systems of regional importance – an in-depth study of lot feeding
- Beef markets and specifications

Animal Science
- Animal anatomy and physiology
- Cells, tissues and organs
- Hormonal and physiological interactions e.g. ovulation
- Study of the main structures and systems
- A detailed study of the ruminant and monogastric digestive systems
- Reproductive systems

Animal nutrition
- Food constituents
- Nutritional requirements
- Selected animal rations and their nutritive value
- Rations used for different types of animals and production categories
- Feed additives
- Study of food conversion ratio of cattle
- Growth promotants
- Comparative studies of dressing percentages

Animal growth and development
- Relationships between growth and development, carcass characteristics and marketing

Reproductive technology
- Artificial insemination and embryo transfer
- Oestrus synchronization

Assessment:
Report
End Semester Exam

Semester 2 (Yr11) Livestock Management

Animal Production Systems
Social influences on production, e.g. animal welfare, waste management and chemical residues

Animal Health
- Characteristics of healthy animals
- prevention, control and treatment of diseases and pests
- specific diseases common to livestock in S.E Queensland
- exotic diseases
- common livestock pests – cattle ticks and buffalo fly
- quarantine issues – local and national

**Animal Behaviour**

**Genetics**
- Genetic theory
- Selection methods and breeding practices
- Estimated breeding values (EBVs)

**Agribusiness**

**On-farm management**
- Decision making and risk management
- Record keeping and budgeting

**Product Management**
- Quality control, packaging and storage
- Value-adding processes
- Transport
- MSA grading system

**Beyond the farm gate**
- world markets

**Assessment:**
Oral Presentation
Mid Semester Exam
Feedlot Trial (Extended Agricultural Investigation)

**Semester 3 (Yr12) Crop Management and Production**

**Natural resources management**
- Climate in agriculture
- Process of soil formation and the soil profile
- Soil types and soil classification
- Landcare and property planning
- Sustainable management and production practices

**Plant Science**
- Plant anatomy
- Plant growth and development
- Plant propagation
- Plant health – Nutrient requirement and deficiencies

**Crop production on the Darling Downs**
- Summer and winter grain production, crop rotations, markets and end uses
- Tillage operations – Conservation tillage (Zero and Min till)
- Technology and Precision Agriculture
- Chemical groups and modes of action
- Chemical application – Spray drift, Mixing, Water Quality, Surface temperature inversions and nozzle selection.
- Herbicide resistance
- Integrated Pest Management (IPM)
- Water use efficiency
- Fertiliser applications and maintaining nutrition
- Weed management
- Carbon Farming
- Grain storage

**Assessment:**
Mid Semester Exam
End Semester Exam

**Semester 4 (Yr12) Challenges Ahead For Agriculture**

**Challenges**
- Prevention, control and treatment of diseases and pests
- Identification and classification of agricultural plants
- Plant breeding practices
- Developing hybrids
- Genetic engineering and gene transfer
- Genomic biodiversity

**Agribusiness**
- Agriculture and the economy
- Marketing – Beef and Grain
- Contracts and forward selling
- Finance and purchasing
- Beyond the farm gate – factors affecting the marketing of farm products
- Supply and demand

**Government policies**
Promotion and advertising careers and training in rural industry

**Assessment:**
Plant Trial (Extended Agricultural Investigation)
Essay
Plant or Insect Collection