**Sample Course Outline**

Plant Production Systems

ATAR Year 12

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# Sample course outline

# Plant Production Systems – ATAR Year 12

## Unit 3 and Unit 4

#### Semester 1

| **Week** | **Syllabus content** |
| --- | --- |
| 1 | * Course description and assessment * Revision, update on key concepts from Year 11 |
| 2–4 | Systems ecology   * comparison of natural, agricultural and urban ecosystems, including the energy flow and recycling of matter * conservation of biodiversity and natural ecosystems * climate change and possible impacts on production systems |
| 5–7 | Plant structure and function   * utilisation of the net products of photosynthesis * transpiration and its controls * absorption and translocation of nutrients * plant hormones and their role in plant physiology, including gibberellins, ethylene, cytokinins and auxins * manipulating plant processes by managing plant growing conditions * the use of plant hormones in manipulating end products * use of synthetic hormones in weed control   Investigating plant production   * develop hypotheses to test, based on prior information * design and conduct an investigation considering aspects of experimental design, including variables, controls, randomisation and replication * analyse and interpret data, including use of standard deviation and standard error * present data using appropriate methods * draw conclusions based on experimental data and validate from other sources * evaluate experimental design, including possible bias and experimental error, and propose areas for future investigation |
| 8–11 | Plant environment   * determining the availability of water in growing media and soil water management * production records used in nutrition management * decision making involved in fertiliser selection, including soil and crop type, stage of growth, cost, availability, and application method * designing a plant nutrition program * management of plant nutrition and soil water throughout the growing season * nutrient application to reduce environmental impacts |
| 12–14 | Plant health   * economic principles of pest and disease control, including thresholds and economic injury levels of pests * the relationship between modes of action of pesticides to their effectiveness, and to resistance risk * the development of pesticide resistance * avoiding and managing pesticide resistance * management strategies for pest and disease outbreak on a local, national and international level * comparing the effectiveness of different pest control methods |
| 15 | Examination revision |
| 16 | Semester 1 Examination |

#### Semester 2

| **Week** | **Syllabus content** |
| --- | --- |
| 1–4 | Sustainable production   * intergenerational equity, ensuring that the wellbeing of future generations (social, economic and environmental factors) are not compromised by the activities of the current generation * duty of care in the workplace * planning for sustainability: balancing short-term needs with long-term improvement of resources * establishing short-term and long-term enterprise goals * optimising production through new technologies * managing the conflicting demands of social, environmental and economic factors, also known as the ‘triple bottom line’ * responding to the impacts of climate change on production systems * assessment and management of risk, including probabilities, consequences, avoidance and mitigation |
| 5–7 | Breeding and improvement   * sources of genetic diversity, including seed banks * breeding technologies, including genetically modified organisms (GMO) * steps in breeding new plant varieties * developing cultivars for specific environments and markets * impact of breeding technologies and related ethical issues |
| 8–10 | Economics, finance and markets   * comparative advantage of Australian producers in the international market * importance of the global economy to Australian plant production, including major markets and competitors * use budgets and gross margins to compare profitability of management decisions * use market information to plan production and marketing * use financial records to guide decision making * maintaining Australian global competitiveness * protection strategies for Australian markets, including quarantine and tariffs * altering production systems in response to consumer trends |
| 11–14 | Produce for purpose   * identify variations in product quality and quantity and causes, including variety, weather, nutrition, handling and transport * effect of product variation on financial return * evaluate on-farm practices to meet quality assurance criteria * propose adaptations to production systems to improve efficiency or to meet changed circumstances * evaluate new technologies to optimise production |
| 15 | Examination revision |
| 16 | Semester 2 Examination |