



Year 9-10
Scientific Research Awards 2008



"A Partnership between the Tasmanian Women in Agriculture and The University of Tasmania"

Guidelines and Ideas

GUIDELINES

Submitted entries should be examples of scientific research and investigation, with a relevant application to primary industry and agriculture.

This should be seen as a broad field of study with numerous potential scientific investigations (see Ideas below). Any area of research is encouraged, from specific farming practices to laboratory studies, as long as there is a credible link to primary industry in some form. This link needs to be clearly stated within the final written report, with any possible application of the results explained.

Investigations should be based on correct scientific method, with the following aspects taken into consideration:

- Use of hypothesis to define the initial problem
- Evidence of the use of a control or control groups
- Replication of treatments and/or experiments
- Limitation of variables being tested in a single experiment
- Valid measurements of relevant, applicable data

Projects do not have to be completed within school hours or on school property. Students may be encouraged to set up experiments at home or utilise local farms/industries if they are able. This may provide wider scope for larger experimental trial sites or studies that involve appropriate use of animals (stock or wildlife).

The following are key components for students attempting the Awards:

- Registration of Project
- Written Report indicating an ongoing record or work
- Final Display

The Award organisers are not responsible for providing equipment or resources related to specific Projects. This will be primarily the responsibility of individual students or teams, in consultation with appropriate teachers and the school.

The Awards are limited to students who are in Grade 9 and 10 in 2008.

The following types of projects will not be accepted:

- Anything in violation of animal welfare regulations.
- Projects that involve the use of prohibited substances or chemicals, or dangerous chemicals used in an unsafe or inappropriate manner.
- Any project that involves unnecessary risk of harm to the student or other individuals.

Examples of projects that are less likely to succeed:

- Survey Projects (eg opinion sampling, product use) – unless clear scientific method shown
- Information gathering (eg. what is the water cycle? or report on the planets)
- Models, demonstrations or collections.
- Projects with small sample size
- Projects in which the results are common knowledge
- Projects which duplicate standard class/textbook experiments
- Anything with purely subjective measurements

HUMAN SUBJECTS:

If a Project involves the use of volunteer human subjects in any manner (collation of information, physical testing, questionnaires etc) then **you must obtain their prior permission**, explaining fully what you expect of them and how you will use the results of the tests. You must also present the results in a way that the individual's privacy is guaranteed. No experiments, which may be deleterious to the health or physical integrity of the subjects may be carried out.

No responsibility is accepted by Tasmanian Women in Agriculture, The University of Tasmania, the Industry Sponsors, staff or volunteers for any known or unknown cause that may result from involvement with the project.

IDEAS (also refer to www.utas.edu.au/sciencelinks)

The following are ideas to prompt further exploration and generate a relevant study. Students are not limited to these categories or project ideas; however they provide a sample of the potential scope available

1. Biology

Examples: Can household substances (eg tea) make plants grow better? Investigation of wine-making techniques – what works best? Compare different yeast fermentation techniques for converting sugars to alcohol. Do fertilisers really work? How can I stop mould growing on my bread? Best ways to sterilise milking equipment. What's the best disinfectant? What effect do native animals have on grazing pasture? etc

2. Environmental Science

Examples: Study effect of agricultural chemicals on water quality. How does salt in the soil affect plants? The effects of water impurities on plant growth. Examine effects of cropping practices on wildlife populations. Compare different irrigation systems for energy efficiency. How does grazing frequency affect overall pasture volume/production (or, if you cut grass more often does it grow more)? How do native animals and their grazing affect overall pasture volume/production? Differences between rain-watered and controlled-watered plants etc

3. Animal Science

Examples: How do worms affect plant growth? Study of population fluctuations in insects. Effects of different feeding regimes on animals. Effect of different conditions on milk (volume, quality, cream content etc). Effectiveness of sterilisation with iodine sprays on cows' teats. Compare effects of different thawing temperatures on livestock semen. Compare effects of different nutrient levels on animal growth. Effectiveness of insecticide varieties etc

4. Plant Science/Soil Science

Examples: Factors affecting flowering. Comparison of different plants' ability to add humus to the soil. Organic fertilizer versus chemical fertilizer. Exploring methods of controlling erosion. Fertiliser applications (types, rates, methods of spread and their effects). Soil compaction and effects of/how to prevent it. Effects of different soils on plant growth. Examine effect of light/temperature/compost type on mushroom growth. Compare plant growth using hydroponics and conventional methods. Effect of ultraviolet light on soil microbes. Can potatoes be grown effectively without soil? Compare water movements through different soil types. Composting etc

5. Physics/Engineering

Examples: Develop alternate energy source engines. Investigate light energy sources. Test how much water is 'sucked up' into different soils. Compare various tillage methods for energy efficiency. Investigating (with models) different shed designs. What method of fencing is strongest? Most effective method of improving drainage. Testing windmill design and effectiveness. Effectiveness of different ploughing methods/shearers' blades/baling methods/fuels/etc. Comparison of the load bearing strength for different soils.

6. Other ideas

Examples: Other ideas might include: Designing and building a wasp trap. Best/new/modified heating system for chicks. Setting up a working hydroponics system and growing something. Invent something new or modify something to make it better. This award basically includes a mix of designing, building, testing, modifying, etc with the outcome being a product that does a particular job effectively. The focus is on real-life, practical value (applicability) and the processes used by the student to produce the enterprise.