IOWA STATE UNIVERSITY
AGRON/ECON 496:
AGRICULTURAL PRODUCTION, BUSINESS, AND TRADE IN AUSTRALIA

2011
Dr. Ebby Luvaga
Dr. Tom Loynachan
Dr. Sergio H. Lence
Dr. Ken Young
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Itinerary

**Thursday, March 10th**
- 8:45 am: Meet In Lot 29 (Behind Molecular Biology Building) to Board Charter Bus
- 12:06 pm: Depart Des Moines Airport for Denver: UNITED FLIGHT: 7546
- 3:15 pm: Depart Denver Airport for San Francisco: UNITED FLIGHT: 735
- 7:45 pm: Depart San Francisco to Auckland, NZ: Air New Zealand flight 7

**Saturday, March 12th**
- 7:00 am: Depart Arrive Auckland, NZ to Sydney Air New Zealand 701
- 8:30 am: Arrive Sydney Airport and clear customs
- 10:00 pm: Drop off at hotel – Devere Hotel, 44-46 Macleay Street, Potts Point NSW Check into hotel, freshen up, rest, nap, etc.
- 1:30 pm: Sydney orientation tour – Hyde Park, Darling Harbour, Circular Quay
- 4:15 pm: Opera house tour
- 5:30 pm: Complete orientation tour out to Bondi and back to Hotel

**Sunday, March 13th**
- Own free time: Ken will be available to assist students with where to go, tickets, etc.
- **Suggested major sites:**
  - Sydney museum, Fort Denison, Queen Vic Bldg – shopping, China Town, Sydney Bridge – climb or walk, Taronga Zoo, Aquarium, Darling Harbour/ Circular Quay/ The Rocks, Sydney Olympics site, Botanical Gardens, Sydney Tower, Maritime Museum, etc.

**Monday, March 14th**
- 6:15 am: Depart hotel for fish markets
- 6:50 am: Behind the scenes tour (10 students only)
- 8:00 am: Return to hotel
- 9:00 am: Depart hotel
- 10:30 am: Mowbray Park Produce, Sydney Basin
- 12:30 am: Depart Sydney Basin
- 1:30 pm: Lunch en route
- 2:00 pm: Fitzroy Falls National Park
- 3:30 pm: Travel to Goulburn
- 4:30 pm: Goulburn Big Merino – wash room refreshment stop
- 5:00 pm: Travel to Canberra,
- 6:30 pm: Arrive at Pavilion on Northbourne
- 7:00 pm: Walk or public transport into Commonwealth Park for Canberra day fireworks

**Tuesday, March 15th**
- 6:15 am: Depart hotel for Balloon festival
- 6:30 am: Balloon festival and breakfast
- 8:00 am: Gather at meeting point to walk to Parliament House
- 9:00 am: Collected at Parliament House, travel to Botanical gardens
- 9:30 am: Botanical gardens – rainforest and eucalypt walk
- 10:00 am: Wiradjuri Echoes dance performance
- 11:00 am: Wiradjuri Echoes boomerang workshop
- 12:00 noon: picnic lunch in gardens
- 1:00 pm: CSIRO National Insect collection
- 2:00 pm: CSIRO Plant Industries
- 4:15 pm: USA Embassy
- 6:00 pm: BBQ Dinner at Ken’s house
**Wednesday, March 16th**

7:30 am: Depart hotel for Boorowa
9:00 am: Springwaters Poll Dorset Stud, Boorowa
10:30 am: Travel to Holbrook
1:00 pm: Lunch in Holbrook at Submarine
1:30 pm: Androssan Angus Stud, Holbrook
2:30 pm: Travel to Wagga Wagga via Henty & The Rock
3:30 pm: Charles Sturt University winery & farm tour
5:30 pm: Travel to Pavilion Hotel, Wagga Wagga

**Thursday, March 17th**

7:30 am: Travel to Leeton
9:30 am: Rice farm
10:15 am: Orange Grove
11:00 am: Vineyard
12:00 pm: Lunch on farm Leeton
1:00 pm: Travel to Cobram
3:00 pm: Pullars Orchards (apples and pears)
4:30 pm: Travel to Dookie College University of Melbourne campus
5:30 pm: Arrive Dookie College University of Melbourne campus

**Friday, March 18th**

*(Day for students (and academics) to go out with farmers (2-3 person/grower)*

08:30 am: meet in dining room for allocation to farmers
09:00 am: depart with farmers
12:00 noon: return with farmers for lunch
2:00 pm: travel to Tabhilk Winery, Nagambie
3:00 pm: Vineyard and winery tour
4:00 pm: structured wine tasting
4:30 pm: depart for Melbourne

**Saturday, March 19th**

6:30 am: Travel Cobden
9:00 am: Dairy farm, Cobden
Noon: Lunch at Port Campbell
1:30 pm: Great Ocean Road Site Seeing - Apostles, London bridge the grotto
4:30 pm: Swim & lunch at Lorne
7:00 pm: return to hotel Melbourne

**Sunday, March 20th**

8:00 am: Melbourne introductory tour of city
Own free time: Travel to Ken will be available to assist students with where to go, tickets, etc.

*Suggested major sites:*
Aussie Rules football, St Kilda Beach, Queen Victoria Markets, Victorian Museum, National Gallery of Victoria, Melbourne Zoo, Aquarium, Botanical Gardens, Rialto Tower, etc.

**Monday, March 21st**

8:30 am: Pack and checkout of hotel
9:30 am: Check in at airport. Clear customs etc
11:30 am: Depart Melbourne to Auckland. Air New Zealand flight 124
7:30 pm: Depart Auckland NZ to San Francisco, Air New Zealand : flight 8
2:28 pm: Depart San Francisco to Denver, United flight 720
7:35 pm: Depart Denver to Des Moines United flight 538
10:40 pm: Bus to Iowa State
Trip report

The Trip Report is the permanent record of your travel and will be due the Friday of Dead Week (May 2, 2011). It is the tangible evidence of your learning during the trip and should reflect your best efforts. Content, grammar, and presentation will be evaluated. The report should be more than a travel log; it should be an evaluative summary of your observations during travel. You will be seeing many new (and exciting) things; this will allow you to compare those things to your existing experiences. Areas to include are cultural, educational, and agricultural activities. Late reports will receive a reduced score equaling 5% per day (M-F).

The reports will be graded by all three course instructors.

Please organize your report and label the sections in the following manner, which will facilitate grading and ensure that your materials are complete.

TRIP REPORT CONTENTS

Section 1. Introduction. This sets the stage of timing and facts leading up to the trip. It addresses your feelings and expectations of the travel.

Section 2. Body. This section is broken into three separate sections centered on cultural, educational, and agricultural experiences or stops. Remember, some of your most reveling cultural experiences may be during ‘free time’ when you are alone or with a small group of fellow travelers. Your group cultural, educational, or agricultural stops must be included in this section. It is best to organize this section in chronological order. Pictures will greatly aid your professional presentation and will be important for your memories in years to come. Either plan to take your own photos or work with others to record the events. Remember, this is not merely a travel log, but it is an interpretative summary of your learning.
   a) Details of the experience or stop. These details are quickly lost with time so be sure to record them in your notes at the first opportunity.
   b) A narrative description of the experience. This should include your assessment of the experience. Relate it to your background culturally, educationally, or agriculturally. What was noteworthy? You should record these thoughts in your journal, perhaps at the end of each day.
   c) An evaluative statement. This is best done upon reflection, perhaps after returning to the USA. What did this experience mean to you in helping form your overall assessment of the learning experience?

Section 3. Overall summary and conclusions of the travel experience.

Section 4. A summary of your topical report findings. During your travel, you hopefully will have an opportunity to expand your knowledge of your topical area. Furthermore, after travel, you will evaluate conditions/resources in the USA and make comparative evaluations between the USA and Australia. Section 4 should include your pre-trip and post-trip fact sheets and a summary of your findings during travel. Additionally, it should include a written comparative summary of the two countries (perhaps this will take 5 pages to be complete). This written summary is the basis for your post-trip fact sheet and oral presentation.

Section 5. Raw Notes. These are the detailed daily notes that you took during each stop. Use the questions provided in the spiral-bound notebook to help you document factual information, key observations, reflections and feelings about each stop. Take time at each stop, during bus travel, or in the evening to reflect on the daily stops. These notes are to be in your own words in a form you can read and understand. Instructors may wish to review with you your notes during travel, especially to ensure that you are taking adequate notes. Use these raw notes to formulate your Trip Report upon returning to Ames. You are required to submit your raw notes as an attachment to your report or contained in a pouch at the end of your report.
Code of Conduct for Australia Trip Student Copy

IOWA STATE UNIVERSITY – DEPARTMENT OF ECONOMICS
AGRON/ECON 496: AGRICULTURAL PRODUCTION, BUSINESS, AND TRADE IN AUSTRALIA

Name of Applicant: ____________________________

Read carefully and sign the “Director Copy” of the following agreement, and keep the “Student Copy” for your records. Signing this agreement indicates your willingness to abide by the following policies and guidelines for the trip to Australia.

CODE OF CONDUCT FOR TRIP TO AUSTRALIA

The trip directors do not anticipate any problems on this trip because they feel that participants are responsible and compatible. However, it is best if participants agree to some simple policies to deal with situations that could occur. All possible options cannot be covered but, the following few general policies can establish the context for dealing with problems should they arise.

1. Students will exercise good judgment, be aware that their personal actions have consequences, and work to maintain a positive “group dynamic.” Everyone will contribute to the group's welfare while in Australia and maintain a creative and positive attitude. Participants will not take unnecessary risks, in country, in transit, or in group, that could jeopardize the success of the program. The program will be physically and mentally demanding and individuals should avoid situations that impair their health and judgment.

2. Individuals will not be late for program activities. Repeated lateness, or missing transportation departures, will result in individuals being left behind. Everyone has a schedule and anyone left behind should catch up at his/her own expense.

3. A "buddy system" will be used while traveling, and on sites in Australia. Buddies do not have to be room mates, but should be designated in groups of 2 to 4. Students will watch out for one another even while on the study site. The directors should be contacted immediately if there is any reason for concern.

4. “Solo” excursions are strongly discouraged. Students MUST supply the directors with a written itinerary, contact numbers (hotel, etc.) if they choose to travel independently during the program. Students should also share such information with their parents or guardians.

5. If someone asks or suggests to a participant that his/her particular behavior is inappropriate (within reason, not just being picky or overly sensitive), the participant will take the request into consideration. If the attitude of a particular participant is being disruptive to the learning and enjoyment of the group, that particular person will be talked to by the directors. Extremely disruptive behavior will result in dismissal from the group with the individual responsible for finding his/her own way home. Directors will contact ISU officials in such cases.

6. Individuals are responsible for their own actions and for learning the applicable laws. Participants will be subject to Australian laws during their stay in Australia. Those getting into legal problems, which in the judgment of the trip directors are self created, will be left to deal with the problems on their own.

7. Alcohol policy: ISU's position is that the laws of the country govern who and who may not drink alcohol.

   In Australia, anyone 18 years or older may purchase and consume alcohol. The program policy is that students will not be allowed to consume alcohol on the bus, or during site visits, unless it is a sanctioned program activity. Students are therefore responsible for their actions and individual participants have an obligation to not ruin the trip for others. The following suggestions will be used to govern infractions:

Code of Conduct for Australia Trip Student Copy

a. Sickness: If unable to participate in activities due to over-indulgences of alcohol, the afflicted person will be excused from activities and/or left behind, and must rejoin the group at their own expense. Repeated over-indulgence will result in the person being asked to abstain from alcohol consumption for the rest of the trip.

b. Damage created under the influence: The person(s) responsible for any damages will: (i) be financially responsible for any restitutions to be made for the damages incurred, (ii) deal with any penalties dealt by Australian authorities, and (iii) abstain from future alcohol consumption.

c. Repeat offenses: If problems persist which cause the overall dynamic of the program to be disrupted, whether physically or emotionally, due to someone’s abuse of alcoholic beverages, the offender will be asked again to refrain from consuming any alcoholic beverages. If further necessary, the offender will be terminated from the program and asked to return to the U.S. at his/her own expense. This action will automatically result in a grade of “F” for the course.

d. A suggestion: If someone in the group says “no more for you,” then no more for you.

8. Everyone is responsible for his/her own baggage and equipment while traveling to, within, and from Australia. Important and valuable stuff should be carried in a backpack or pocket. The group will not go back for items left behind. Individuals can try to arrange forwarding by phone from the next stop. If money or credit cards are lost, the individual will be responsible for wiring home for money to complete the trip.

9. Participants with any health concerns must disclose this information in writing on the study abroad application. Injuries/health problems will be treated by Australian medical personnel in accordance with directions on health history form. Treated individuals are responsible for medical bills through personal funds or as directed by their own insurance plan. Relatives will be contacted in cases of any major emergency situations.

10. Individuals are responsible for asking questions in daily briefings about dangers involved in the day’s activities and for assessing the personal risks involved in an activity. General risks relate to situations such as ground and air transportation, and urban dangers. No one is forced to participate in a program activity. However, lack of participation may adversely affect a student’s grade, and a student will not receive refunds for program activities he/she does not participate in.

I have read and understood the above Code of Conduct for the Australia Program and agree that I will abide by the policies and guidelines outlined. I understand that if I violate the code of conduct, I will receive a verbal warning, written warning and, if unheeded, could face termination from the program.

Signature of Applicant:_________________________________ Date:___________________

Directors: Dr. Ebby Luvaqa Dr. Tom Loynachan Dr. Sergio H. Lence
174A Heady Hall 1126 Agronomy Hall 368E Heady Hall
Email: luvaga@iastate.edu Email: teloynac@iastate.edu Email: shlence@iastate.edu
CAPTAINS OF THE DAY

<table>
<thead>
<tr>
<th>March 10</th>
<th>March 17</th>
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<tr>
<td>March 12</td>
<td>March 18</td>
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<td>March 13</td>
<td>March 19</td>
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<td>March 14</td>
<td>March 20</td>
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<td>March 15</td>
<td>March 20</td>
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<tr>
<td>March 16</td>
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The Gift Team:

Captains-of-the-Day assigned alphabetically (see duties below). The Gift Team is responsible for obtaining, transporting (may seek help from fellow travelers), and distributing gifts on behalf of the group (see item 4 below).

DUTIES:
1. In general, help ensure the smooth running of the day’s activities. When traveling by air, help with check-in, luggage identification, keeping track of fellow travelers, etc.
2. See that all travelers are awake at least forty-five (45) minutes before breakfast/departure time. See that all luggage and passengers are aboard at proper times.
3. During travel by bus, sit in the front ready to assist the driver, guide, or instructors.
4. During the visit with each host, obtain the correct spelling and mailing address of host. After returning to the USA, send a written thank-you note expressing the group’s appreciation for the time the host spent with the group (copy also send to instructors).
5. The instructors will be responsible for giving a formal thank you to host(s) after each stop. Captains-of-the-Day should select an appropriate gift and make a brief presentation to the host(s).
6. After all stops, take a “head-count” to assure no one is left behind. Should be 25 of us from the USA.
7. At an appropriate time, lead the group in a discussion after each stop. What is new, exciting, and different from USA? This is important because some may have difficulty in hearing the host.
8. Assist with room check-ins and check-outs. Because you will be waking travelers in the morning, assist in room check-ins the day before you serve as Captains-of-the-Day.
9. Assist in deciding meal arrangements and timing of stops when the group’s input is sought.
10. Assist bus driver in keeping bus livable.

PLEASE BE COOPERATIVE WITH CAPTAINS-OF-THE-DAY

Your colleagues Expertise (pre planning talks)

<table>
<thead>
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<th>Production and exportation of wool</th>
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<tbody>
<tr>
<td>Insects affecting crop production in Australia and the strategies used to control them</td>
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<tr>
<td>Sheep production and market</td>
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<tr>
<td>Australian grain marketing system</td>
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<tr>
<td>Cairns Group and Australia’s participation</td>
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<td>Biosecurity</td>
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<tr>
<td>Ethanol production in Australia</td>
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<tr>
<td>Australian climate and crops grown in various climatic regions</td>
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<tr>
<td>Fish production in Australia</td>
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<tr>
<td>Grape and wine industry</td>
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<tr>
<td>Water conservation and management in Australia</td>
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<tr>
<td>Commercialization of wheat</td>
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<tr>
<td>Australian national parks</td>
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<tr>
<td>Industry of hops (specifically used for brewing)</td>
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<tr>
<td>The beef industry</td>
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<tr>
<td>Dairy marketing</td>
</tr>
<tr>
<td>Dairy production</td>
</tr>
<tr>
<td>The pulse crop industry</td>
</tr>
</tbody>
</table>
Fruits and vegetables in Australia
Barley production and marketing
The role of GMO crops in Australian agriculture
Wildlife conservation
Australian performing arts including the Opera House
Precision agriculture in Australia
The swine industry
Australia's exports and imports of agricultural goods
Soils of Australia

**Room List**

**Roommates**

Based on room availability, instructors may be placed with students. If odd number, put instructors together or in private room.

**2 per room**

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
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<tbody>
<tr>
<td>Macy June Krug</td>
<td>Andrew John Heath</td>
</tr>
<tr>
<td>Katie Kristine Yule</td>
<td>Benjamin Jay Tweeten</td>
</tr>
<tr>
<td>Hilary Ann Morris</td>
<td>Benjamin Merrill Carlson</td>
</tr>
<tr>
<td>Marcie Elaine Stevenson</td>
<td>Jeremy Dean Oxley</td>
</tr>
<tr>
<td>Jessica Marie Marty</td>
<td>Kyle Patrick Ruth</td>
</tr>
<tr>
<td>Breanne E Wagner</td>
<td>Brent Austin Sexton</td>
</tr>
<tr>
<td>Adriana Marie Dubbelde</td>
<td>Landon James Kane</td>
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<tr>
<td>Amanda Ann Lorack</td>
<td>James Gorman Kent</td>
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<tr>
<td>Kaci Elizabeth Demott</td>
<td>Scott Robert Johnson</td>
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<tr>
<td>Chelsy Louise Sonnichsen</td>
<td>Kevin Lynn Wuebker</td>
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<tr>
<td>Laura Nicole Lant</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructor--Female</th>
<th>Instructors--Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ebby Luvaga</td>
<td>Sergio Lence</td>
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<tr>
<td></td>
<td>Thomas E. Loynachan</td>
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<td></td>
<td>Ken Young</td>
</tr>
</tbody>
</table>

Bus Driver
### 3 per room

#### Female
- Macy June Krug
- Laura Nicole Lant
- Katie Kristine Yule
- Adriana Marie Dubbelde
- Hilary Ann Morris
- Marcie Elaine Stevenson
- Amanda Ann Lorack
- Jessica Marie Marty
- Breanne E Wagner
- Kaci Elizabeth Demott
- Chelsy Louise Sonnichsen

#### Male
- Andrew John Heath
- Jeremy Dean Oxley
- Benjamin Jay Tweeten
- Landon James Kane
- James Gorman Kent
- Kyle Patrick Ruth
- Benjamin Merrill Carlson
- Scott Robert Johnson
- Kevin Lynn Wuebker
- Damian Earl Hosch
- Brent Austin Sexton

#### Instructor--Female
- Ebby Luvaga

#### Instructors--Male
- Sergio Lence
- Thomas Loynachan
- Ken Young

#### Bus Driver
Some Useful Terminology and conversions

<table>
<thead>
<tr>
<th>Australian</th>
<th>U.S.A.</th>
</tr>
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<tbody>
<tr>
<td>Header</td>
<td>Combine</td>
</tr>
<tr>
<td>Combine</td>
<td>Sowing drill / planter</td>
</tr>
<tr>
<td>Paddocks</td>
<td>fields</td>
</tr>
<tr>
<td>Station</td>
<td>Ranch</td>
</tr>
<tr>
<td>Lucerne</td>
<td>Alfalfa</td>
</tr>
<tr>
<td>Fresians</td>
<td>Holstiens</td>
</tr>
<tr>
<td>Yank</td>
<td>Countryman</td>
</tr>
<tr>
<td>Chemist</td>
<td>Drug Store</td>
</tr>
<tr>
<td>Tomato sauce</td>
<td>Ketchup</td>
</tr>
</tbody>
</table>

**Definitions**
- **Gday**: Oz for hello, can be used with MATE – a friend – “Gdaymate”
- **Thong**: traditionally a piece of open footwear like a sandal but without any heel enclosure and material between your big toe and the next toe. More recently also refers to a piece of underwear.
- **A Pot**: refers to a 285 mL (10 fl oz) beer glass in Victoria
- **A middy**: refers to a 285 mL (10 fl oz) beer glass in New South Wales
- **A schooner**: refers to a 425 mL (15 fl oz) beer glass in New South Wales
- **A pint**: refers to a 570 mL (20 fl oz) beer glass
- **A slab**: refers to a carton (usually 24 375 mL cans or stubbies of beer)
- **Stubbie**: usually referring to a 375 mL glass bottle of beer, but can also refer to a pair of shorts
- **Vegemite**: Australian delicacy put on bread or toast, eaten anytime of the day more often for breakfast
- **Pie**: A pastry crust filled with meat and gravy

**Conversions**

- **Hectare to acres**: multiply by 2.471
- **Kilograms to Pounds**: divide by 0.4536
- **Tonnes/ha to bushels/acre**: divide by 0.0673
- **Kg/ha to lb/acre**: divide by 1.12
- **Centigrade to Fahrenheit**: multiply by 1.8 then add 32
- **Litres to gallons (US)**: multiply by 0.26417
- **Millimetre to inches**: divide by 25.4
- **Millimetres to points**: divide by 0.254
- **1 bushel corn (56lb) to kilograms**: multiply by 25.40
- **1 bushel wheat/soybeans (60lb) to kilograms**: multiply by 27.22 kg
- **Kilometres to miles**: multiply by 1.6
- **Bags per acre to T per ha**
  - Wheat: divide by 5
  - Barley: divide by 6
  - Oats: divide by 7
  - Pulses: divide by 5
  - Canola: divide by 5.7
  - Triticale: divide by 5
  - Rye: divide by 5
Background Notes

Overall

Much of eastern Australia is bound near the coast by the Great Dividing Range. On the western flanks of the range are large arable plains drained by the Murray Darling river systems. As can be seen in the satellite view, Sydney is hemmed in by ranges. This caused significant problems to the European settlers. In the 1950-60s the Snowy Mountains were dammed and the water diverted from flowing south and east to flow west into the Murray and Murrumbidgee rivers where irrigation settlements were set up.

General History of Australia

In geological terms Australia was part of Gondwanaland Land (hence the name of the band), which included South America India and Africa. After the tectonic plates split apart, Australian flora and fauna developed in isolation. While there was a land bridge through the Indonesia to Asia, little introductions across this bridge seemed to have occurred. The original human inhabitants of Australia are the aboriginal races whom are believed to have been here for greater than 50 000 years. Generally, the aborigines are though of as hunter gathers leading a nomadic life which is true for many of the tribes, which operated in a annual changing weather pattern. Some however in more stable environments did start early farming including the pioneers of aquaculture by farming eels in Victoria.

Europeans began visiting the Australian coastline on voyage to the East Indies since the 1600s but recognition of Australia existence did not occur until the 3rd voyage of the English Explorer Captain Cook in 1770. In was not until 1788 that Britain decided to send the first settlers to Australia, mostly in part due to the Independence of their American colony. The first establishment was Sydney. It was not until the 1800s that major exploration started taking place in the Australian outback. Until the banning of transportation in 1868, most of Australia was developed through convict labour.

Migration has been a major part of economic advancement for Australia. This commenced after WWII, with migrants mainly coming initially from England, but also Germany and Scandinavian countries (due to a White Australia policy), followed by Greek and Italian migrants in the 50s & 60s, and more recently Vietnamese, Chinese, (80s), middle eastern and African migrants (00s)

Murray Darling Basin

The Murray–Darling Basin consists of 23 major river valleys and covers one million km2 across four states and the ACT.

It is one of the largest and driest catchments in the world, and includes 16 Ramsar wetlands.

It is highly significant to Australia, to Aboriginal Australians, to the Australian economy and is an iconic part of the Australian environment. Over two million people live there.

The Basin’s agriculture produces $15 billion worth of produce annually, 39% of Australia’s total agricultural production. It contains around 65% of Australia’s irrigated land area and around 40% of Australia’s farms.

Twenty of the 23 major river valleys of the Basin are in poor to very poor ecological condition.
The Basin presents a varied landscape, from semi-arid ephemeral river systems in the north to highly regulated river systems in the south fed from the Australian Alps. To the east and south, the highlands of the Great Dividing Range form the limit of the Basin, while in the north, west, and south-west the boundaries are much less distinct. By far the greater proportion of the Basin is made up of extensive plains and low undulating areas, mostly no more than 200 m above sea level. A consequence of the extent of the Basin is the great range of climatic and natural environments: from the rainforests of the cool eastern uplands, the temperate mallee country of the south-east, the inland sub-tropical areas of the north, to the hot, dry semi-arid and arid lands of the western plains.

This landscape has been home to Aboriginal people for at least 50,000 years; sustaining cultural, social, economic and spiritual life. Trade routes, major gathering places and sacred sites exist across the length and breadth of the Basin. Aboriginal people all along the Murray and Darling rivers and throughout the Basin talk of their deep relationship to the rivers. Still today, 34 major Aboriginal nations maintain their traditional lands within the Basin, and the Basin’s waters, waterways and wetlands remain significant places.

**The Basin Plan**

The Water Act and the proposed Basin Plan build on a long history of water reform in Australia. Much of this reform has centred on the future environmental, social and economic health of the Murray–Darling Basin. For more than a decade, the Australian Government and Basin states have been working together to restore the environmental health of the Basin and redress past decisions.

In 2007, supported by both sides of Federal Parliament, the Water Act was passed to deal with the management of water resources in the Basin in the national interest. The Water Act established the Murray–Darling Basin Authority and tasked it with preparing a Basin Plan. In 2008, again supported by both sides of Federal Parliament, amendments to the Water Act were passed to enhance the arrangements.

The development of the Basin Plan is supported by other significant water reforms. These include:

- The National Water Initiative, which, among other things, establishes the principle of risk and cost-sharing for the recovery of additional water for the environment between the Australian Government, Basin states and individual entitlement holders. These principles are a critical consideration for the Authority’s proposals on transitional arrangements and risk allocation.

- The Australian Government’s Water for the Future program, which allocates $12.6 billion over 10 years to restore the health of the Basin. Two critical elements of this program are important for the development of the Basin Plan:
  - The first of these is establishment of the Commonwealth Environmental Water Holder to manage water purchased in the market. The purchasing of water for the environment from willing sellers will reduce the potential impact on individual water entitlement holders from potential reductions to entitlements. The Authority has factored this into its assessment of the potential impacts of reductions in current diversion limits.
  - The $5.8 billion investment (part of the $12.6 billion program) in water efficiency projects, which will also generate additional environmental water.

The Authority is required to:

- give effect to relevant international agreements
- protect, restore and provide for the ecological values and ecosystems services of the Basin
• promote the use and management of Basin water resources in a way that optimises economic, social and environmental outcomes
• ensure the return to environmentally sustainable levels of extraction for water resources that are over allocated or overused
• maximise net economic returns to the Australian community from the use and management of Basin water resources while protecting, restoring and providing for the ecological values and ecosystems services of the Basin.

Overview of Australian Agriculture

Australian agriculture is based on the continent’s variable climate and topography such as the Great Dividing Range running down the eastern side of the continent. Along the coastal fringe there is vegetable, beef dairy and horse industries. On the inside of the range is where the majority of grain production occurs (temperate). As rainfall decreases, production switches to sheep (wool & meat) (grasslands) and as rainfall further decreases into the arid zones there is another change to cattle (in order for them to walk large distances for feed and water) (Figure 1). Cattle species change from *Bos taurus* to *Bos indicus* as you head into the more tropical parts of Australia.

Figure 1 – Australian Climate Classifications

There are some large areas of horticulture and irrigated agriculture inland of the Great Divide due to extensive dam projects built after the WWII. These projects diverted rainfall from the Great Divide heading to eastward to the sea to flow down the tributaries of the Murray Darling catchment. We are visiting the Murrumbidgee, Murray and Goulburn river systems during the tour.

General Overview of Grain Production in Australia

The major grain crops of Australia are wheat, barley, canola, triticale, maize, sorghum soybeans, faba beans, lentils, field peas and chickpeas. These crops are mainly grown in what is called the Australian Wheat belt, which runs on the western (inland side) of the Great Australian divide in Eastern Australia then into South Australia and in south western part of Western Australia (Figure 2). The rainfall where these crops grow is between 350 – 600 mm annually. Rainfall is predominately winter fed rain falling between May and October (Growing Season). The exception to this is grain production in northern NSW and Queensland where rainfall occurs in summer and winter crops are grown on stored moisture. Summer crops are grown in northern parts of the wheat belt that receive summer rainfall and irrigation areas in northern Victoria and South Western NSW. The Snowy Mountain Scheme feeds these irrigation areas.

![Figure 2: Grain Production areas in Australia; Source: http://www.grdc.com.au](http://www.grdc.com.au)

Importance of the Australian Grain Industry

Australia ranks as the 4th - 5th largest exporter of wheat in the world though in production it ranks only 10th (Table 1). This is due to other nations that produce large quantities of wheat use most of this in their domestic market. Where Australia exports 80% of its wheat, hence the Australian industry is well geared up for export markets with close ties with our major importers. The Australian wheat industry is worth $4 billion representing 0.6% of the Australian Gross...
Domestic Product ($640 Billion / $33,281 / capita). The grain industry is the largest agricultural industry in Australia closely followed by the beef industry ($6.1 B), dairy ($3 B), fruit ($2.6 B), cotton ($2 B) and vegetables ($2B).

Table 1: Wheat production and export volumes in 2000 – 01 for the top 10 wheat producing countries (ABARE 2002).

<table>
<thead>
<tr>
<th>Country</th>
<th>Production Mt</th>
<th>Rank</th>
<th>Export Mt</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union</td>
<td>104.3</td>
<td>1</td>
<td>35.7</td>
<td>1</td>
</tr>
<tr>
<td>China</td>
<td>99.6</td>
<td>2</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>75.8</td>
<td>3</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>60.5</td>
<td>4</td>
<td>28.9</td>
<td>2</td>
</tr>
<tr>
<td>Russian States</td>
<td>60.1</td>
<td>5</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>26.8</td>
<td>6</td>
<td>17.5</td>
<td>3</td>
</tr>
<tr>
<td>Australia</td>
<td>23.8</td>
<td>7</td>
<td>16.6</td>
<td>4</td>
</tr>
<tr>
<td>Pakistan</td>
<td>21.1</td>
<td>8</td>
<td>11.5</td>
<td>5</td>
</tr>
<tr>
<td>Argentina</td>
<td>16.5</td>
<td>9</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>17.5</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On a State by State basis Western Australia is the largest producer followed by NSW, SA then Victoria, Queensland and Tasmania. Victoria however has the largest average yields (t/ha) of the mainland States (Table 2).

Table 2: Area yield and production of wheat for each state in 2000 – 01 (ABARE 2002).

<table>
<thead>
<tr>
<th>State</th>
<th>Total area (‘000 ha)</th>
<th>Average Yield (t/ha)</th>
<th>Total Production (kt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA</td>
<td>4.753</td>
<td>1.31</td>
<td>6.209</td>
</tr>
<tr>
<td>NSW</td>
<td>3.877</td>
<td>2.16</td>
<td>9.365</td>
</tr>
<tr>
<td>SA</td>
<td>2.129</td>
<td>2.32</td>
<td>6.398</td>
</tr>
<tr>
<td>Vic</td>
<td>1.259</td>
<td>2.68</td>
<td>4.622</td>
</tr>
<tr>
<td>Qld</td>
<td>1.259</td>
<td>3.37</td>
<td>5.378</td>
</tr>
<tr>
<td>Tas</td>
<td>1.259</td>
<td>3.57</td>
<td>7.082</td>
</tr>
</tbody>
</table>

Oilseed production in Australia is dominated by canola and cottonseed oil representing 57% and 36% of 3 millions tonnes / annum. The other two major crops are soybeans (3%) and sunflowers (4%) with linseed and safflower being minor crops. Canola is grown in the similar areas to wheat production though where at least 350 mm of annual rainfall is received.

Sowing of the major grain crops (wheat, canola, barley, triticale) occur after the autumn break (April May) where summer crops (maize, soybeans, rice) occur during spring or early summer (Table 3).

Wheat and Canola Supply Chain

After harvest grain is transported by trucks from the farm to the grain receival silos. On farm grain storage is increasing with storage for up to 9 months. Which silo the grain is taken to depends on both what each grade of wheat each silo is taking (segregation), and the price the silos are offering. For canola there is no segregation.

Segregation

Australian grain is segregated into various grades based mainly on protein and hardness. The main grades are Australian Prime Hard (APH), Australian Hard (AH), Australian Premium White (APW), Australian Standard White (ASW), Noodle wheat (ASWN), Soft wheat (ASF1), Durum (ADR), Australian General Purpose (AGP) and Feed wheat (FEED). The silos are generally run by the major bulk handling carriers (BHC’s). Over the last few
years there has been an amalgamation of BHC’s. It the responsibility of the recieval point of the grain for segregation and to maintain the integrity of the grain throughout its storage and transport.

**Australian Wheat varieties**

Most of Australian wheat varieties are spring wheat’s not the traditional winter wheat’s grown in the northern hemisphere. These wheat’s are also generally white wheat’s not the red wheat’s of Europe and the USA. White wheat is favoured for bread making, which is why Australia has some marketing advantage over the EU and the USA. Spring wheat does not have a vernalisation requirement where winter wheat does. Both spring and winter wheat have a day length requirement hence why spring wheat is sown in autumn in Australia.

**General Overview of Dairy Industry in Australia**

The dairy industry continues to be one of Australia’s major rural industries. Based on a farmgate value of production of $3.4 billion in 2009/10, it ranks third behind the beef and wheat industries. It is estimated that approximately 40,000 people are directly employed on dairy farms and manufacturing plants. Related transport and distribution activities, and research and development projects, represent further employment associated with the industry.

Dairy is also one of Australia’s leading rural industries in terms of adding value through further downstream processing. Much of this processing occurs close to farming areas, thereby generating significant economic activity and employment in country regions. ABARE estimates this regional economic multiplier effect to be in the order of 2.5 from the dairy industry.

Dairying is a well-established industry across temperate and some subtropical areas of Australia. While the bulk of milk production occurs in south-east seaboard states, all states have dairy industries that supply fresh drinking milk to nearby cities and towns. A range of high-quality consumer products, including fresh milks, custards, yogurts and a wide variety of cheese types, are produced in most Australian states. Nevertheless, the manufacturing of longer shelf life products, such as cheese and specialised milk powders, is steadily becoming more concentrated in the south-east region of Australia.

Today, dairy is Australia’s third largest rural industry and a major regional employer, not only on-farm but also through processing, manufacturing and distribution of finished products. It is a cost-efficient and proficient producer of high quality milk. On-farm productivity continues to increase through improved pasture, feed and herd management techniques.

While supplementary feeding with grains is becoming increasingly common, the Australian dairy industry remains predominantly pasture-based. All States (Victoria being most dominant) have viable milk productions, supplying fresh milk to nearby cities and towns. As a major regional employer, the industry value-adds through the processing of milk to produce fresh lines such as butter, cream, cheese and yogurt. Bulk milk and specialised powdered milks are also significant.

**Australia's Dairy Heritage**

In 1788, Captain Arthur Phillip and the First Fleeters came ashore at Sydney Cove with seven cows and two bulls bred to survive a hostile environment. This small herd soon moved to the greener pastures of Parramatta where they escaped into the bush not to be seen for some seven years. Upon their recapture, the herd comprised 61 cattle. It was the cows of this group which became Australia’s first dairy herd. By 1800, through breeding and importing, there were 332 bulls and 712 cows in the colony. The settlers were adapting to their new Australian environment. They made butter and cheese during spring and summer (when cows produce most milk), and preserved these commodities with salt for autumn and winter.
Pioneers such as John Macarthur imported more dairy cattle to his Parramatta farm while, in 1805, Dr John Harris built Sydney’s first commercial dairy at what is now inner-suburban Ultimo. However, Tasmania gave Australia its first cheese industry. In the 1820s, the Van Dieman’s Land Company established Australia’s first commercial cheese factory. Farmers from the NSW district of Illawarra began to send their cheese and butter to Sydney markets by sea, and as more ports opened, dairying extended all the way down to Bega.

In 1832, with two cows and two calves, John Fawkner arrived in what was to become Melbourne. With the ideal dairying conditions around Port Phillip Bay, the herd grew. Within a year, there were 155 cattle in the district. By 1850, there were 347,000. South Australian dairy farmers were becoming so successful that they were selling cheese to Tasmanians. In 1891, there were almost 1 million dairy cows in Australia. The gold rush brought thousands of people to Australia. With its collapse, many were offered Government pastoral leases on the outskirts of inland towns. By 1900, there was hardly a township, even in remote outback Australia, that did not have its own fresh milk.

The future of an extraordinary industry

**General Overview of Beef Industry in Australia**

Beef production is Australia’s second largest agricultural industry. In 2006–07, the gross value of production, including live cattle exports, was $7.99 billion.

Australian beef land use

The industry extends over almost half of Australia’s land mass across all climatic zones and is Australia’s most extensive industry. This means that environmentally it has a closer association with more of Australia’s land resources than any other agricultural industry.

Similarly, in economic and social terms, the beef industry relates to more rural and regional communities, including Indigenous Australians, than any other industry.

Productivity for the beef industry shows an overall increasing trend since the late 1970s, with the average productivity growth being 1.4% per year. Productivity growth has been achieved through:

- advanced breeding genetics
- improved herd, pasture and disease management
- the advent of lot feeding in turning off cattle
- the development of the live cattle trade, stimulating higher weaning rates and lower age of turnoff in northern herds.

The beef industry has exported an average of 65% of annual beef and veal production since 2000. In international terms, it outperforms other countries in export sales from a small production base.

**Historical overview**

The first European settlers arrived in 1788 with six head of cattle. The Year Book Australia 1901-07 records:

... during the years immediately succeeding the first settlement, the growth of the number of livestock was slow and notwithstanding importations from India and the Cape of Good Hope, the total of the herd amounted in 1800 to 1,044 cattle. During the next fifty years, however, the pastoral industry made rapid strides and at the end thereof (1850) the total reached 1,894,834.

This growth was to continue for the next 50 years and by 1900 the beef cattle herd had climbed to 8.6 million head. However, the impact of two world wars and the Depression saw numbers remain comparatively stable for the
next 50 years, and in 1950 the beef cattle herd stood at 9.7 million head.

Despite the introduction of Brahman cattle in the 1930s, Australia’s beef herd continued to be dominated by *Bos taurus* cattle of British origin, such as Hereford, Aberdeen Angus and Beef Shorthorn, well into the 1950s. During the 1950s more *Bos indicus* breeds were introduced and they, and their crossbred offspring, have proven to be well suited to the northern parts of the continent. These cattle have played a major role in the development of Australia’s northern cattle herd and the growth of the live cattle trade to South East Asia. In the late-1960s, large European *Bos taurus* breeds such as Limousin, Charolais and Simmental were introduced and crossed with British breed stock to produce later finishing, larger animals.

With this new mix of breeds, beef cattle numbers increased rapidly through the 1960s and 1970s to reach a peak of 29.8 million in 1976. Due to high levels of world production of beef and the imposition of quantitative limitations on imports by major overseas buyers, world beef prices collapsed during 1974-75. Drought and continued low prices in the early-1980s led to a decline in the beef herd to 19.4 million by March 1984. For the next five years, the size of the herd remained relatively static. Between 1989 and 2002, beef cattle numbers gradually increased to a peak of 24.7 million in June 2002, but the recent drought has reduced the beef herd by nearly 1.4 million head over the past two years.

**General Overview of Sheep & Wool Industry in Australia**

The Australian sheep and wool industry occupied an area in excess of 85 million hectares. These production areas are generally located in the inland, central and southern areas of Australia, and represent one of Australia’s major land users.

Sheep and wool production occurs across much of central Australia, but is split geographically into three zones. These zones are: high rainfall, wheat sheep and pastoral.

Wool

Wool is still quite an important product of Australian agriculture. The Australian wool industry is widely recognised as producing the finest quality Merino wool. This is largely attributable to selective breeding and a superior genetic line.

As of 2001 Australian wool production accounted for 9% of world production (Australian Bureau of Statistics Data). However, it dominates the fine quality wool sector, producing 50% of the world’s Merino wool.

Although sheep are farmed Australia-wide, 36% of the flock is in New South Wales.

Research and development for the industry is led by Australian Wool Innovation Limited (AWI), a producer owned company. Australian wool is marketed by the Woolmark company. Both companies are held by Australian Wool Services, a company created by legislation.

The industry is export-oriented. Historically, up to 90% of Australian wool was exported. The industry has suffered from a lowering demand for natural fibres, and a decrease in wool prices worldwide.

Animal rights organisations including PETA are currently promoting a boycott of Australian, and all Merino wool, as a protest against the practice of mulesing, a necessary procedure to prevent them getting fly blown with maggots. Due to the worldwide attention, AWI has proposed to phase out the practice by 2010. A major issue for the sheep industry is the increasing importance of lamb and mutton as a profit driver and a relative decline in the importance of wool. The Productivity Commission (2005) report annual average growth in mutton and lamb export value of around 10% between 1990 and 2003 compared to an annual decrease of 3% for greasy wool. While production of wool and meat are inextricably linked, there is a culture regarding wool and meat as separate industries when it comes to research, production and marketing. This approach will be to the long term detriment
of sheep producers whether they specialize in fine wool or quality meat production.

The outlook for sheep meat continues to be strong and meat as a profit-driver is increasingly important in the sheep industry. Wool, however, remains an important component of profitable production and is likely to continue as a major profit driver for the Australian sheep industry.

**Historical overview**

The first sheep came to Australia with the First Fleet in 1788. Governor Phillip had obtained them from the Cape of Good Hope on the voyage to the new colony. With their hairy fleeces and fat tails, they were suitable for food, not for wool production. Additional small lots of these Cape Fat Tails came subsequently, but the few that survived the voyages did not last long. They were obviously unsuited to their new environment.

In 1797 Captains Waterhouse and Kent arrived at the Cape of Good Hope from Port Jackson, intending to return with cattle. At the time, 26 Merinos were up for sale. They were descendants of two rams and four ewes that the King of Spain had presented to the Dutch Government eight years earlier. Waterhouse and Kent each bought 13 - surely a lucky number in the history of the Australian wool industry.

Kent's sheep were believed lost. Waterhouse distributed his among Kent, Macarthur, Captain Rowley and the Reverend Samuel Marsden and probably others. Macarthur obtained four ewes and two rams. We know little about the quality of these sheep. However, they were certainly the ancestors of the present-day Camden Park flock in New South Wales. They were believed to be Escurials, the royal flock of the King of Spain.

As early as 1794, Macarthur had bought 60 Bengal ewes and lambs, and had later added two Irish ewes and a young ram. He had found that, after crossing the two breeds, the lambs of the Indian ewes bore a mingled fleece of hair and wool. Thus the idea came to him of breeding to produce fine wool. His acquiring the Cape Merinos gave him his unique opportunity.

Credit must be given to the Reverend Samuel Marsden, Captain Waterhouse, Mr William Cox and others for their pioneering role in fine-wool production in New South Wales. However, Macarthur transcended their work. By his vision, his practical experimentation and his persistent work in London as propagandist for Australian Merino wool, he has left a name that will always be remembered in connection with the industry in this country.

Explorers fanning out from Port Jackson began to discover undreamed of grazing lands in the new continent. The crossing of the Blue Mountains in 1813 revealed ideal pastures and good rivers to the west. Soon, sheep were grazing there. Settlers followed the explorers further and further south and north. In Van Diemen's Land, the sheep industry had been established soon after the formation of the new settlement in 1803. When the first overlanders arrived at Port Phillip in 1837, they found that sheep had already been shipped there from the island. Meantime, in 1834, the Hentys had settled at Portland Bay in south western Victoria.

The great sheep drive extended northward into what is now Queensland where, at Moreton Bay, official settlement had begun in 1824; and in 1838 the first overlanders arrived with stock at Adelaide, which had been settled two years before. In 1829 the Swan River settlement, separate from the eastern system, was founded in the west and grazing began there.

By the end of the 1830s, in an amazing series of explorations and settlements, the sheep industry had been established in every colony. From those first few Merinos brought from the Cape of Good Hope in 1797, the sheep and wool industry grew. Today, Australia produces most of the world's fine apparel wools and is the world's largest wool exporter.

**General Overview of Rice Industry in Australia**

Rice is grown on irrigated farms in the Murray and Murrumbidgee valleys of south-western NSW and northern Victoria. Australia produced approximately 1.25 million tonnes of rice in 2001/02.

There are around 2,000 family operated farm businesses growing rice in the Murrumbidgee valleys of NSW and the Murray valleys of NSW.
and Victoria. In NSW all growers are shareholders of Ricegrowers Limited which is the company responsible for production and marketing of rice and rice based food in Australia and Internationally. These families produce 1 to 1.7 million tonnes of rice as well as other irrigated food and fibre products. The average size of an Australian rice farm is around 400 hectares.

Eighty per cent of rice produced in Australia is of medium grain Japonica varieties. These are commonly known as temperate varieties – grown throughout the world in climates similar to Australia. These climates reach high summer temperatures without the humidity of tropical climates and are well suited to Japonica varieties.

The remainder of rice grown in Australia is long grain Indica type varieties, including fragrant rice. Amaroo and Millin are the most popular medium grain varieties and Langi is the largest selling long grain. Australia also produces shorter grain varieties, such as Koshihikari specifically for the Japanese market.

The industry has strict regulations to ensure the maintenance of high growing standards that have minimal impact to the environment.

In the Murrumbidgee Valley, rice grows on no more than one third of each farm. In the Murray Valley, there is a total hydraulic load limit of 4 megalitres per hectare. These policies seek to provide an even distribution of water over the landscape and balanced hydraulic pressure on the water table.

Rice grows only on approved ‘heavy clay’ soils that minimise seepage into water tables. These are established using electro-magnetic technology (EM31) and soil textural analysis of samples bored at intervals across the paddock. More than three metres of heavy, continuous clay is required for unrestricted rice growing.

Water use on rice cannot exceed the industry target requirement. Allowable water consumption levels for rice growing are set by Irrigation Companies utilising climatic data records by the CSIRO. Should these limits be exceeded, farmers must attend an interview with the Irrigation Company. This may result in restrictions on the use of individual paddocks for rice in subsequent year, or the banning of rice production on those paddocks - Rice is the only agricultural crop to have such rigorous restrictions applied.

No rice crop grows within 150 metres of a watercourse.

Water recycling systems are encouraged, as careful monitoring by Irrigation Companies of drainage water entering drainage schemes must meet Environmental Protection Agency (EPA) standards.

**Historical overview**

Rice seeds were brought to Australia by Chinese gold prospectors around 1850. Rice production in Australia is believed to have first occurred in Queensland during the gold rush period around 1850-1860.

The first record of rice cultivation in South Eastern Australia was in 1906, when the Victorian Government allocated 200 acres of land on the Murray River to a former Japanese parliamentarian, Isaburo Takasuka, to demonstrate rice growing. After persevering through floods and droughts, he produced a crop for commercial sale in 1914.

The Water Conservation and Irrigation Commission trialed Californian and other rice varieties in 1922/23 and 1923/24. The first commercial rice crops were grown in the Murrumbidgee Irrigation Area in 1924/25.

**General Overview of Wine and Grape Industry in Australia**

Wine grape growing and winemaking are carried out in each of the six states and two mainland territories of Australia. The principal production areas are located in the south-east quarter of the Australian continent, in the states of South Australia, New South Wales and Victoria.

Wineries in South Australia’s Barossa Valley, in the Hunter River region north of Sydney in New South Wales and in Victoria played a major role in the development of the industry and continue to be important sources of fine wines. However, wine is produced in over 60 regions, reflecting the wide range of climates and soil types that exist across the continent. These areas include Mudgee, the Murrumbidgee River and Murray River valleys (New South Wales); the Southern Vales, Clare Valley and Riverland (South Australia); and Rutherglen and the Yarra Valley (Victoria). The states of Western Australia, Tasmania and Queensland have smaller wine industries, which have grown rapidly in volume, quality and reputation. The region near Australia’s national capital, Canberra, has a recognised cool-climate wine industry.
Australian wine is made using a generous range of grape varieties. In 2006–07, shiraz was the most-produced variety, followed by chardonnay and cabernet sauvignon. Premium white varieties other than chardonnay include semillon, riesling and sauvignon blanc. The main red wine varieties, other than shiraz and cabernet sauvignon, are merlot, grenache and pinot noir.

Wine is very much a part of Australian life, closely associated with both business and leisure. Wine consumption is often linked to the country’s outdoor-oriented lifestyle as well as to the cosmopolitan, urban way of life of the bulk of the Australian population.

In global terms, Australia was ranked sixth in the list of world wine producers in 2005, producing 1.4 billion litres of wine. Australia is consistently one of the top 10 wine-producing countries in the world. Being such a large country with almost every climate and soil type, Australia is one of the few wine producers to make every one of the major wine styles.

In 2006–07, sales of Australian wine totalled approximately 1.23 billion litres: 449 million litres were sold domestically and 786 million litres were exported. Australian wine exports were worth $2.87 billion, which represented an increase of 4.4 per cent over the previous year.

Australia’s largest wine export market in 2006–07 was the United Kingdom (269 million litres, worth $977 million), closely followed by the United States (215 million litres, worth $856 million). Other leading destinations for Australian wines included Canada, Germany and New Zealand.

Wine production is a significant industry in Australia. It directly employs 28 000 people in both winemaking and grape growing (2006 Census) and generates related employment in the retail, wholesale and hospitality industries.

Tourism adds another dimension to wine’s importance in Australia. International and domestic tourism related to the wine industry accounts for an important share of Australia’s export earnings, employment and taxation income.

In 2006–07, the industry crushed 1.39 million tonnes of grapes to make 955 million litres of beverage wine. In 2007, the total wine grape vineyard area reached 163 951 hectares of bearing vines, and there were a further 9825 hectares of non-bearing vines. The area of bearing vines has more than doubled since 1996–97.

In 2006–07, the domestic market accounted for 36 per cent of total sales of Australian wine by volume. Table wines made up 84.9 per cent of local wine consumption, sparkling wines accounted for 8.8 per cent and fortified wines for 3.8 per cent.

**Historical overview**

The first vines arrived with the first European settlers in Australia in 1788. Initially wines were produced in the coastal region around the fledgling settlement of Sydney. John Macarthur established the earliest commercial vineyard.

In 1822, Gregory Blaxland shipped 136 litres of wine to London, where it was awarded the silver medal by the forerunner of the Royal Society of Arts. Five years later, a larger shipment of Blaxland’s wine won the gold Ceres medal.

The planting of vines accompanied the spread of European settlement across the Australian continent, and by the beginning of the 20th century Australia was exporting some 4.5 million litres of mainly full-bodied dry red wines to the United Kingdom.

The end of the Second World War saw a rapid influx of migrants from Europe, who brought with them a strong culture related to wine. This provided an important impetus to the Australian wine industry.

However, it was the period from 1996 to 2007 that saw spectacular growth in exports, following rapidly increasing appreciation of Australian wines overseas. Major wine producers from abroad have invested in Australian wineries, and Australian companies have taken controlling interests in wineries in countries such as France and Chile.

Australia has some of the oldest grapevines in the world. Many of Europe’s established vineyards were destroyed by disease in the 1800s, and only the vines brought to Australia survived. In order to preserve these, Australian viticulturalists developed new vine management techniques, some of which are now used throughout the world. Australians have also invented ways to produce wines using fewer chemicals, and Australia is the home of the wine cask.

**General Overview of Horticultural Industry in Australia**

The horticultural industry is diverse and widespread. The industry supports more than 100 crop types and these are categorised into 21
commodity groups. For the purposes of this investigation, these commodity groups are further grouped into broad categories of annual and perennial production types, each with several commodity groups. This dissection was used due to each broad grouping having a similarity of natural resource management (NRM) approach.

A summary of this division for the Australian horticulture industry includes the following commodity groups:

- **annual** horticulture: beans and peas, brassicas, cucurbits, leaf vegetables, melons, nurseries, onions and garlic, peppers, potatoes, root vegetables, sweet corn and tomatoes
- **perennial** horticulture: asparagus, bananas, berry fruit, citrus, nuts, pome fruit, pyrethrum, stone fruit and tropical fruit

The horticulture industry is distributed throughout all Australian states and centred predominantly near major river systems or irrigation developments.

Horticulture is grown in areas of high rainfall or in areas with accessible and reliable water supplies. Temperature ranges for horticultural crops range from warm frost free winters needed for growing tropical fruits to cool, frequent winter frosts for citrus and pome fruits. Soil types are often free draining and considered as good agricultural land.

The industry is supported by infrastructure of packing sheds and often refrigerated transport networks. In recent times, the horticulture industry has commenced competing with sugar industry in certain areas for the productive soil and water resources.

### Annual Horticultural Production Areas

The industry employs in excess of 93,000 people. The largest area of horticultural production occurs in the temperate slopes and plains agro-ecological region (AER), predominantly in the lower Murray-Darling basin. Production yields are greatest for perennial crops in this area, though yields for annual crops are greatest in the wet temperate coastal AER, which is also the largest area of land use for annual crop production. The wet subtropical coastal region is the largest perennial crop growing area with production predominantly occurring in the Rockhampton, Bundaberg, Maryborough and Wandoan areas and the upper Murray-Darling Basin area.

### Vegetables

The Australian vegetable production sector is an important supplier of food to the domestic market, supplying most of the fresh vegetables consumed in Australia and also providing vegetable inputs for a large proportion of the processed vegetable products consumed in Australia.

However, despite the sector’s importance in supplying food, in economic terms the vegetable production sector is relatively small. Over the period 1999-2000 to 2005-06, vegetable growing accounted for an average of around 6 per cent of the gross value of Australia’s agricultural production.

Australian vegetable growing enterprises are geographically dispersed, with a presence in all states. The wide range of climate and soils in Australia enables many types of vegetables to be grown in various parts of the country. Potatoes are the major vegetable crop in terms of area sown, value of production, and volume of consumption, and are grown commercially in all states. Tomatoes, carrots, and onions are other major vegetable crops grown in Australia.

New South Wales and Victoria are the largest vegetable growing states in terms of total area sown, while the Northern Territory grew the smallest area of vegetable crops.

An estimated 18 per cent of vegetable growers produced their vegetable crop under some form of protection — such as glass, poly, plastic or shadecloth structures. For these growers, around 80 per cent of their total vegetable revenue per farm came from crops produced under protective covering.

### Perennial Horticultural Production Areas
Citrus

Today, 32,000 hectares of citrus are planted by about 2800 growers. The major production regions are in the Riverland, South Australia; Murray Valley, Victoria and New South Wales; Riverina, New South Wales and the Central Burnett region in Queensland. There are also additional plantings throughout Western Australia, inland and coastal New South Wales, regions in Queensland, as well as smaller plantings in the Northern Territory.

Total Australian citrus production has averaged 615,000 tonnes over the last 5 years (from 2003-04 to 2007-08). Production has slightly decreased across all varieties (Navels, Valencias, Mandarins, Lemons/Limes and Grapefruit) particularly since 2005-06.

The key non-bearing varieties include;
Navels – Navelina (early), Washingtons (mid) and Lanes (late) Mandarins – Imperials

Key citrus varieties are Navels, Valencias and Mandarins. Navels mainly grown in 3 southern growing regions Murray Valley, Riverina and Riverland Valencias mainly grown in Riverina and Mandarins mainly grown in QLD

Key citrus growing region share of total hectares: Riverina 28%; Riverland 24%; Murray Valley 23%; QLD 15%; Other 10%.

Irrigation systems used vary but main irrigation methods are Drip (22%) and Overhead (16%). Others include; Under Canopy 14%; Under Tree 13%; Furrow 12%; Low Level 8%; Micro Sprinkler 4% Other 5%

The majority of growers (41%) have total citrus area of between .25 and 5 hectares; 3% have less than .25 hectares 22% have between 5-10 hectares 18% have between 10-20 hectares 16% have over 20 hectares

Historical overview

Australian citrus production began in 1787 when the English First Fleet set sail under instructions to introduce plants and seeds for sustainable horticulture. Lemons, limes, oranges, grapefruit and mandarins were planted in and around Sydney and formed the basis of today’s national industry.

The early settlers found Australia’s diverse climate ideal to produce a large range of quality, sweet and juicy citrus. In the southern growing regions, hot, dry summers promote energetic growing while cool winter rains encourage excellent orange fruit growth and exceptional colour. In contrast, the combination of summer heat and humidity, and dry winters in the northern growing regions of the country are ideal for producing superior mandarins.

Apple and Pear

The apple and pear industry is the third largest horticultural industry in Australia after grapes and citrus.

Apples and pears are grown in all six Australian states. The major apple and pear producing areas are Stanthorpe in Southern Queensland, Orange and Batlow in New South Wales, the Goulburn Valley and Southern Victoria, Huon Valley in Tasmania, Adelaide Hills in South Australia and the Perth Hills, Donnybrook and Manjimup regions in Western Australia. In addition, there are many small pockets of apple and pear production in each state.

Victoria is Australia’s largest producer of apples and pears, generally producing more than 30 per cent of the nation’s apples and close to 90 per cent of the nation’s pears - mostly from the Goulburn Valley area around Shepparton. New South Wales and Western Australia are the next largest apple producing states.

The main apple varieties grown traditionally have been Red Delicious and Granny Smith (55 per cent of production in 1998/99). But newer varieties such as Gala, Fuji, Cripps Pink (sold using the trademark brand Pink Lady™) and Cripps Red (sold using the trademark brand Sundowner™) now account for nearly 50 per cent of production.

In 2007, Granny Smith was the most produced apple with 24 per cent of the total crop with Pink LadyTM a close second with 21 per cent of the total crop.

Australia, in relation to other Apple and Pear producing countries, represents around 0.8 per cent of world production of apples and 1.4 per cent of world pear production.
General Overview of Cotton Industry in Australia

The Australian cotton industry occupied an area of 535,400 hectares. These production areas are generally restricted to inland southern/central Queensland and New South Wales. Research is being conducted in Western Australia’s Kununurra and Broome areas to assess the viability of expanding the cotton industry.

Approximately two-thirds of Australia’s cotton is grown in NSW with the remainder produced in Queensland. The major production area in NSW stretches south from the Macintyre River on the Queensland border and covers the Gwydir, Namoi and Macquarie valleys. In NSW cotton is also grown along the Barwon and Darling rivers in the west and the Lachlan and Murrumbidgee rivers in the south. In Queensland, cotton is grown mostly in the south in the Darling Downs, St George, Dirranbandi and Macintyre Valley regions. The remainder is grown near Emerald, Theodore and Biloela in Central Queensland.

Most Australian cotton farms are owned and operated by family farmers. These farmers grow other crops and often graze sheep and cattle as well. Australian cotton farms are typically 500 to 2,000 hectares in area, highly mechanised and technologically sophisticated (Source: CRDC, 2004).

In 2006/07 Australia yielded 1.3 million cotton bales (from 142,000 hectares) compared to China’s 31 million bales and the USA’s 20 million bales (Source: ICAC, 2007).

In 2005/06 transgenic varieties of cotton made up 90 per cent of the Australian cotton crop (Source: ACIC, 2006).

In 2006/07 Australia yielded 1,792kg/ha (7.89 cotton bales per hectare). This figure was almost two and a half times the world average (747 kg/ha). The next highest yielding countries were Brazil (1,338 kg/ha), Mexico (1,247 kg/ha) and China (1,246 kg/ha) (Source: ICAC, 2007).

General Overview of Sugar Industry in Australia

Sugar is the second largest export crop in Australia after wheat with a total annual revenue of around $2 billion.

In 2002, more than 38 million tonnes of cane was crushed in Australia (QLD, NSW and WA) and 5.25 million tonnes of raw sugar produced.

Australia exports about 80 to 85 per cent of raw sugar to buyers overseas. The Australian domestic market for raw sugar is around one million tonnes.

The sugar industry generates more than 40,000 jobs, directly and indirectly.

Sugar in Australia is sourced from sugar cane. Most Australian sugar cane is grown on family-owned and operated farms. Farmers prepare their land by cultivating the soil. Once ready, sugar setts (cuttings from mature cane stalks) are planted. These setts are cultivated for 10 to 18 months. When mature, the sugar cane is harvested using mechanical harvesters.

Harvested sugar cane is transported to a raw sugar mill. Because sugar cane must be milled as soon as possible, mill owners have made substantial investments in cane railway networks and rolling stock. At the mill, sugar cane is weighed and processed before being transported to a shredder. The shredder breaks apart the cane and ruptures the juice cells. Rollers are used to separate sugar juice from the fibrous material, called bagasse. The bagasse is recycled as a fuel for the mill boiler furnaces. Juice from the sugar cane is then subjected to a purification process before being concentrated by boiling in an evaporator. The concentrated juice or syrup is concentrated even further and is seeded with small sugar crystals in a process called crystallisation. The sugar crystals are grown to the required size by adding more syrup while the boiling continues. Syrup is separated from the raw sugar crystals in centrifugals. Molasses is the syrup left over from the final centrifuging. The raw sugar from the centrifugals is then dried and transferred for short-term storage in bulk bins at the mills.

After milling, the raw sugar is transported to a bulk sugar terminal. From here, the sugar is either exported or transported to a sugar refiner like Sugar Australia.
Saturday 12 March 2011

Sydney

Sydney was the first European settlement in Australia, with the arrival of the first fleet from Britain in 1788. Sydney remains the most populous Australian city (6.5 million) with international icons such as the Opera House and Bondi beach. Sydney was rivalled as the biggest Australian city by Melbourne during the late 1800s due to the gold era in Victoria. This set up a rivalry that still is present today. Sydney however is not the capital of Australia, which is Canberra in the Australian Capital Territory.

Monday 14 March 2011

Today we start off in Sydney, visiting the fish markets. Seafood is an integral part of the Australian way of life, with the Christmas fare more often these day being focused around seafood. We then travel out through the suburbs to the market gardens in the Sydney Basin. From there we travel south following the sandstone escarpment to Fitzroy Falls, going through the central highlands. This area is fertile and grazing and horse studs are located here. There also is a large weekend tourist getaway market from Sydney’s affluent. Next we travel slightly westward into the more grazing country dominated by at least in the early days by wool production based on the merino sheep. Our refreshment and washroom break at Goulburn is at the Big Merino. From Goulburn it is down to Canberra, the Nation’s capital, passing lake George which had water in it for the first time for a decade. Along here you will also see the introduction wind energy. Our arrival in Canberra is on Canberra day, which celebrates the Australian Capital Territory getting its own independent Government. So we shall head down into Commonwealth Park for the dinner, music and fireworks.

Sydney Fish Markets

Sydney Fish Market was established by the NSW Government in 1945. From 1945 until 1999, the selling of seafood in NSW was regulated by the Government and all seafood landed in NSW was required to be sold through the NSW Fish Marketing Authority. In 1994, Sydney Fish Market became a privately owned company (50% by the Catchers Trust NSW and 50% by Sydney Fish Market Tenants and Merchants Pty Ltd) and in 1999, the marketing or selling of seafood was deregulated, meaning seafood no longer had to be sold through the Market in Sydney.

Today, Sydney Fish Market employs approximately 57 staff to organise the weekday wholesale Auction, promote Sydney Fish Market as the centre of seafood excellence and the only destination to buy and sell seafood, promote the site as a tourist location and a place to buy Sydney's freshest seafood and is the home of Sydney Seafood School

SFM is the largest market of its kind in the Southern Hemisphere and the world's second largest seafood market in terms of variety outside of Japan, SFM auctions over 100 species daily. Sourcing product both nationally and internationally, SFM trades close to 13,000 tonnes of seafood annually.

http://www.sydneyfishmarket.com.au

Sydney Basin

As the satellite view shows Sydney forms its own little basin. South west of Sydney this basin still is producing vegetables for the Sydney and Canberra regions. Market gardeners in the Sydney Basin farm two geographically distinct pockets: the Hills to Liverpool area on the south-west urban fringe and the outer Blacktown to Hawkesbury region to the north. About 30% of Sydney basin farmers are from culturally and linguistically diverse backgrounds (CALD) across all sectors

After the Murray Basin and the Murrumbidgee, which are more prone to uncertain water supply, the Sydney Basin is the third most important area for vegetable production in NSW.

According to NSW Agriculture, the region’s urban fringe agriculture including market gardening, orcharding, poultry, cut flowers and glasshouse and hydroponic cultivation is worth around $1 billion (which represents 12% of the total NSW production) with flow-on benefits to the state economy of between $2-$3 billion.

The Sydney Basin has 91% of NSW Asian Vegetable production, 90% of parsley, 82% of Mushrooms, 76% of capsicum and chillies, 70% of cucumbers 63% of basil and coriander and 61% of Cabbages.

The Sydney area has comparatively more productive than land elsewhere in NSW (returning $5,500 per ha compared to $136 in NSW as a whole)
The farms in the Sydney region represent an important contributor to Sydney’s food supply, especially perishable vegetables, poultry and mushrooms. This includes more than 50% of Sydney’s market gardens, 40% of poultry production, and 40% of greenhouse production.

The market gardens are of historical, agricultural and social significance to NSW and to Sydney Metropolitan area in particular. The place was supposed to be used as market gardens for more than 150 years, firstly used by Europeans and then by Chinese.

A major issue facing the basin is the rapid residential and commercial development as Sydney’s population expands by up to 1000 a week.

Present advantage to Sydney Basin growers is the trend for consumers to look for farmers markets, low food miles and slow food.

Mowbray Park Produce
Mowbray Park Produce originally operated from the market garden coolrooms on the farm but as business increased, it became necessary to find a better and more conveniently located outlet. They are now one of the leading Fruit Shops in Sydney regional area and supply Fresh Produce, Sydney regions.

The 25 acres property was purchased at Mowbray Park back in 1992. Market garden commenced with the construction of our dam and plant sheds. Their home was completed in 1998, and although the planting had been going on for some time, this was the beginning of full-time farming. The farm is cultivated and produce seasonal vegetables, originally selling to Flemington Markets. In 2001, they started to sell produce at markets around Camden due to local demand and have diversified from wholesale to retail sales. Retailing has been very fulfilling as they now get feedback direct from the consumer.

Fitzroy Falls Morton National Park
Although long known to the aborigines, who passed by it on their migrations from the coast to the Highlands, the falls were 'discovered' in the 1820s by Charles Throsby, pioneer settler of Bong Bong, whose property extended as far as the falls itself.

Its spectacular beauty made it a favourite place for the Throsbys to bring their many guests on picnics. One of these, NSW Governor Fitzroy, visited in 1850 and in typically modest manner named the falls after himself.

Twelve years later, when the area was surveyed, they were still referred to as 'Throsby's waterfall', but the name Fitzroy was to win out.

The falls lie in the path of the Yarrunga Creek, which drops over 80 metres down the escarpment, and flows on into the Kangaroo River. The water flow is not as massive, nor as irregular, as in the past due to a water catchment dam further upstream today. The falls have only be known to dry up once in living memory.

Long recognised for its natural beauty, 4000 acres was set aside as a reserve in 1882, and later attempts to 'develop' the area were thwarted by Highlands residents.

Canberra
Canberra, in the Australian Capital Territory, is Australia's capital city. After Federation in 1901, a site for the capital was sought, and Canberra was selected. The Australian Capital Territory was declared on 1 January 1911 and an international competition was held to design the new capital city of Australia. The competition was won by a submission from American architect Walter Burley Griffin with drawings drafted by Marion Mahony Griffin.

For 21,000 years the Canberra region has been home to the Ngunnawal people. Evidence of their long occupation exists in archeological evidence found at Birrigai Rock Shelter at Tidbinbilla Nature Reserve, in rock paintings in Namadgi National Park and in other places throughout the Australian Capital Territory (ACT). When Europeans settled the area in the early 1820s hundreds of Aboriginals lived in the area, meeting regularly for corroborees and feasts and then breaking off into smaller bands. The Aborigines moved about to take advantage of seasonal foods, such as bogong moths which arrived in their thousands during the summer months. Aborigines continued to live in the area, often working on sheep properties, their numbers diminished by illness and starvation, their culture and language in decline.

In 1820 explorers Joseph Wild, James Vaughan and Charles Throsby Smith discovered the Limestone Plains of the Canberra region, following the discovery of Lake George earlier that year. They crossed the range of hills beside Lake George and reached a point from which they saw what is now the site of Canberra.

The first European settler in the district was Joshua John Moore who established a stock station called 'Canberry'. It's thought the name Canberry is based on an Aboriginal name for the
area 'Kamberra' or 'Kambery'. The middle of Moore's property is approximately where Canberra's city centre is currently sited. In 1913 Canberra became the official name for the area.

Subsequent to Federation in 1901, the Commonwealth Parliament was formed. The grand opening ceremony was held on 9 May 1901 in Melbourne's Exhibition Building. The Commonwealth Parliament continued to sit in Melbourne as the site of the national capital was not yet decided.

The New South Wales Government commissioned a report suggesting possible locations for the seat of Government for the new Commonwealth of Australia. The report suggested three places—Bombala, Yass-Canberra, and Orange—which made it to a short list, and suggested others which were rejected: Albury, Tumut, Cooma and Armidale.

The decision for the Yass-Canberra option was made in 1908 by the Commonwealth Parliament and shortly afterwards the Commonwealth surveyor, Charles Scrivener, was dispatched to choose a site. His instructions were to choose somewhere picturesque, distinctive, and with views.

The Australian Capital Territory was declared on 1 January 1911 and an international competition to design the new capital city of Australia was held. More than 130 entries were received in the competition and the winning entry was submitted by American architect Walter Burley Griffin and his partner and wife, Marion Mahony Griffin.

Walter Burley Griffin was influenced by the City Beautiful and Garden City movements which influenced town planning during the late 19th and early 20th centuries and was also influenced, which included not just the design of a house, but the interiors as well, including stained glass, fabrics, carpet and other accessories.

The influence of the City Beautiful and Garden City movements and by Frank Lloyd Wright's work is clear in Griffin's plans for Canberra - green bands surrounding areas of settlement, wide boulevards lined with large buildings, formal parks and water features.


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**Tuesday 15 March 2011**

Today, we stay in Canberra for the day.

Starting early, we head over to the Parliamentary triangle to see balloons being prepared for flight. We shall have breakfast there, then walk from Old Parliament House up to New Parliament House. Here we will meet our bus and head over to the Australian National Botanical Gardens. We will do a flora tour form Tasmanian rainforests through to arid health and shrublands looking at Australia’s unique flora. Whilst in the Botanical Gardens, we shall be entertained by an aboriginal dance group -Wirajuri Echoes, who will then conduct a boomerang workshop with us. We next visit the neighbouring CSIRO Black Mountain Laboratories precinct to visit the National Insect Collection and speak to researchers based here. Back to the bus and over the USA Embassy to talk about terms of trade and interaction between our two countries. From there it is back to the Hotel, then over to my place for a BBQ and swim if the temperature is warm.

**Australian Botanical Gardens**

The Australian National Botanic Gardens supports a living collection of around 74,000 individual plants arranged in 40 hectares of themed sections. This collection features over 6,200 species which represent around a third of Australia's native plants.

The Living Collection in the Gardens is currently arranged according to a set of themes: taxonomic (displaying the diversity of plant life according to their botanical relationships e.g. Myrtaceae); ecological and geographic (grouping species from similar ecological and geographic areas e.g. Tasmanian alpine heath); horticultural (promoting an appreciation of the horticultural values of native flora e.g. Domestic cool-climate garden display); ethnobotanic (growing plants used by Australia's indigenous people for food, medicine) and fibre conservation (preserving rare and endangered plants).

**CSIRO Black Mountain Precinct**

Four CSIRO divisions are located at the CSIRO Black Mountain laboratories in Canberra: CSIRO Plant Industry; CSIRO Ecosystem Sciences; CSIRO Land and Water; CSIRO Marine and Atmospheric Research.

The CSIRO divisions at Black Mountain undertake a range of research in plant science,
insects (entomology) and issues that affect our land and water resources.

Our plant science on the site includes: wheat breeding; plant based gene technology; native plant biodiversity and conservation; sustainable agriculture.

Our ecosystem sciences research covers: biological weed control; invasive animals and invertebrates; pests; insects as sustainability indicators; chemosensors to monitor food quality; biosecurity and quarantine discovery of new compounds for industry and environment.

Our land and water scientists research: dryland and irrigation farming systems; environmental sensing, predication & reporting; water quality and environmental flows; aquatic ecology; water resources.

**Australian National Insect Collection**

The Australian National Insect Collection (ANIC) is the world's largest collection of Australian insects and related groups such as mites, spiders, earthworms, nematodes and centipedes. There are over 12 million specimens housed in the Collection.

**USA Embassy**

The USA Agriculture Counselor Mr Grant Pettire will address agricultural trade and USA relations with Australia.

**Wednesday 16 March 2011**

Today is the start of the concentrate farming. We will travelling through a variety of production areas including cattle and sheep grazing, dryland farming and also perennial horticulture. We will end up at Wagga Wagga, where Charles Sturt University has its main campus and where they teach agriculture, viticulture, oenology, veterinary science and animal science as well as other non agricultural course. Wagga was recently was hit by a large flood and is still in recovery mode.

**Spring Waters Poll Dorset Stud**

The stud is owned and operated by Dennis Rowley and his son Dane. Dennis has built the business up from scratch. Poll Dorset’s have become a more popular breed as the price of wool dropped and meat price increased. The Poll Dorset is a short wool, meat producing animal, and is by far the most popular of the terminal sire breeds for the production of prime lambs in Australia.

Prime lambs are produced mainly from mating Poll Dorset rams to cross bred Merino and Merino purebred mothers.

The breed, developed in Australia from 1937 - 1954 by introducing the poll gene into Dorset Horn flocks from two other poll breeds and following a strict back-mating programme to achieve close to 100% of Dorset Horn blood. The characteristics of the breed such as rapid growth rate, superior fleshing and muscular development make them ideally suited for the meat trade.

Poll Dorset genes have also been a major contributor to the developing White Suffolk breed and almost all other prime lamb composite breeds in Australia.

**Ardrossan Angus Stud**

Rob & Sally Bulle run a commercial & stud Angus cattle herd. The property consists predominantly of introduced pastures (phalaris/sub clover) with good fertiliser history & weed control. They also grow some forage winter (oats, triticale) & summer crops (forage brassica) to provide additional high quality feed during periods of low pasture growth.

The Angus breed originated in Scotland by interbreeding groups of closely related cattle breeds native to the shires of Aberdeen, Kincardie and Angus. These breeds or strains of cattle have a long history in Scotland. Angus have also been known as Aberdeen Angus.

The first imports of Angus cattle into Australia were to Tasmania in the 1820s and to the mainland in 1840. Angus cattle are now found in all Australian states and territories. Angus are used extensively in crossbreeding programs over Bos indicus females in northern Australia, but are more common in the southern, temperate environments.

**Charles Sturt University**

Wagga Wagga is CSU’s largest campus, spreading over 640 hectares and home to a range of technical facilities and industry standard production services, to provide our students with a real hands-on experience.

CSU’s Wagga Wagga Campus facilities include: state-of-the-art veterinary science clinical centre and laboratories; equine centre; commercial winery that produces award winning wines; television production studio; state-of-the-
The history of the Wagga Wagga Campus dates back to 1892 with the establishment of the Wagga Experiment Farm offering vocational agricultural education on the current site of Wagga Wagga's main campus of Charles Sturt University. However, the first students were not enrolled at the Experiment Farm until 1 October 1896.

Thursday 17th March 2011

This day sees us travel through three irrigation districts dispersed by dryland farming and grazing. The farm visits will focus on the irrigated fruit crops as well as rice.

Murrumbidgee and Murray Irrigation Areas

The Murray Irrigation area is situated in northern Victoria, with the irrigation water coming down the Murray River. This irrigation scheme is part of the larger Snowy Mountain Scheme where water that use to run from the Australian Alps eastward down the Snowy River to Orbost in East Victoria. This water has diverted westward down the Murrumbidgee and Murray Rivers allowing irrigation in NSW, Victoria and South Australia. The Murray River is part of the Murray Darling Basin, the largest natural drainage system in Australia with water west of the Great Dividing Range. A range of crops and pastures are grown using this irrigation water including soybeans, maize, rice, fruit trees, lucerne and dairy pastures.

Major Issue for this area / industry

Salinity is a major issue for any irrigation area. Due to the geological history of Australia there is a natural level of salt in our subsoils. With the previous levels of clearing throughout the Murray Darling Basin there has been leaching of salt downstream and also with the increased irrigation there has been an increase in water tables bringing salt up with it.

Water allocation is another major issue both in the cost of water and the use of water for environmental flows both down the Snowy River and the Murray River. Associated with the cost of water is the type of agricultural enterprise and irrigation type. Presently many irrigation systems are still based on flood irrigation. Water allocation are allowed to be sold within a catchment.

Deregulation of the various industries including the dairy and water industries has seen changes in the structure of these industries.

Leeton District

Garry and Marg Knagge will be our hosts for the morning. Initially taking us around their friends citrus orchard and then another friends vineyard followed by their rice farm. This will be completed with a luncheon of local produce with the growers.

As the heart of the New South Wales Riverina, Leeton is home to the Australian rice industry and is our country’s largest citrus-growing region.

Leeton was the first town built as part of the Murrumbidgee Irrigation Area (MIA) and was designed with the assistance of noted American architect Walter Burley Griffin.

Pullars Orchard & Cool Store

P. Pullar & Co is a large family owned business located in Cobram Victoria, just 3 hours drive north of Melbourne. We built our first cold storage room in 1950 and have grown to 23 cold storage rooms with capacity of over 18,500 pallets. Established almost 100 years ago, the property size is 215 hectares consisting of 100,000 trees! Including a variety of stone fruit - peaches, pears, apples, cherries and plums.

http://www.ppullar.com/

Friday 18th March 2011

Today, you get to go out in small groups with the local farmers of the Dookie area, who have kindly donated their time to show you their farms. On return, we shall have lunch with your hosts before heading out through the Shepparton irrigation district to Tahbilk winery. At the winery we shall have a tour of the vineyard and winery and then have a structured wine tasting. Then will be a 2 hour drive down to the city of Melbourne.

Dookie Campus

Dookie is The University of Melbourne. The University

Dookie campus in all its phases has served the community of Victoria for over 120 years and will continue to do so by educating graduates to maintain the competitive status and sustainability of Australian rural industries and our unique landscapes.
The goal of the Campus is to provide high quality courses, research training and research relevant to the needs of the land and food industries of north east Victoria in particular, as well as south-eastern Australia and beyond.

The Dookie farm has four roles:
- Operate commercially
- Support the educational goals of the University
- Provide a laboratory for research and
- Facilitate outreach and knowledge transfer

The total area of the farm is 2247 hectares (5600 acres). Five enterprises are run on the farm, and each is run according to the principals of sustainable farming systems while maintaining maximum results and benefits. Teaching in all courses at Dookie utilise the resources of the farms. These range from significant practical on-farm experience during TAFE courses, to field trials and research activities as part of the degree programs. There are also casual employment opportunities on all of the farms which give students to opportunity to gain additional practical experience and to make some additional earnings.

Broken Goulburn Catchment

The Goulburn Valley is a major food producer in Australia with fruit production, dairy, grain production and beef and sheep industries being based within the valley. The Valley starts in the Victorian Alps running from Seymour down through Shepparton to the Murray River at Echuca. There are several irrigation schemes within the valley with the main water storage being Lake Eildon. This lake has been at record lows over the last few years, with level being as low as 5%. Outside the irrigation area there is extensive dryland agricultural production with beef cattle production occurring in the upper catchments and wheat / sheep enterprises on the alluvial plains. The valley suffered from a major drought last year and is still recovering from this, especially the dairy industry.

Major Issue for this area / industry

Again in the irrigation areas water allocation is a major issue as the Goulburn Valley is also part of the Murray Darling System. Water use efficiencies of industries are being questioned to improve irrigation practices. Sale of water within the catchment but between irrigation schemes is also under review. One of the storage dams, Lake Mokoan near Benalla is being reviewed to whether its storage should be ceased or decreased as this dam looses a lot of its water through evaporation and also has blue green algae outbreaks. The saving of this water could then be used for environmental flows. A decision is due in 2004 on the fate of the dam.

Salinity is also present within the valley both in the irrigation and dryland areas that threatens long term sustainability of agricultural enterprises.

In dryland areas increased acidity is also of concern. As the soil of this area is already acidic, high agricultural productivity will cause an increase in the acidity levels.

Dookie Farm visits

The farms you are to visit are mainly grain production, some with sheep. The area relies on winter rainfall to produce the crop. Sowing in autumn with harvest around Christmas.

Tahbilk Winery

Established in 1860 Tahbilk is one of Australia's most beautiful & historic wineries. Located in the Nagambie Lakes region of central Victoria (120kms north of Melbourne), one of the nation's premium viticultural areas, the property comprises some 1,214 hectares of rich river flats with a frontage of 11 kms to the Goulburn River and 8 kms of permanent backwaters & creeks.

The vineyard comprises 200 hectares of vines including the French Rhone Valley whites of Marsanne, Viognier & Roussanne; the Rhone reds - Shiraz, Grenache & Mourvedre; along with traditional varieties such as Cabernet Sauvignon, Merlot, Cabernet Franc, Chardonnay, Riesling, Semillon, Sauvignon Blanc & Verdelho.

Vineyard plantings extend back to Tahbilk's founding with original pre-phylloxera Shiraz vines still surviving from 1860 - an eponymous wine produced from them since 1979.

Tahbilk is further blessed with an abundance of further "old vine" plantings including Shiraz from 1933 (the prime source for Tahbilk's 'Eric Stevens Purbrick' Shiraz releases), Cabernet Sauvignon back to 1949 and Marsanne from 1927 (a "sister" white release to the 1860 Vines Shiraz produced from them).

Harvest commences in early March and continues for five to six weeks with approximately 1,600 tonnes (red & white) grapes processed. Total production is over 100,000 cases with just over 20% being exported to the key markets of U.S.A., United Kingdom,
Canada, New Zealand, Switzerland and the Scandinavian countries.

**Saturday 19th March 2011**

It will be a long day today. Initially, a drive west of Melbourne heading across the basaltic grassy plains (mostly covered in suburbs now) and out into the western districts. Initially we will drive through grazing and dryland cropping with irrigated vegetable farms in the valleys. Once a bit further west will enter the Otway region where there is more rainfall and volcanic soils, allowing for rich pastures used for dairying. After our dairy visit, we head for the shipwreck coast. There will be a few stops to marvel at the natural landscapes and even have a swim. We will return to Melbourne along the Great Ocean road.

**Codben Dairy – Western Victorian Dairy District**

Visiting Craig and Tanya Davis’s dairy near Cobden. They have a rotary dairy milking a large herd. Pasture is their main feed source, with supplementary feed such as grain and hay.

**Otway Coast**

The Otway coast is a rugged coastline ringed by sandstone cliffs and offshore shoals that has caused many shipwrecks in the past. The coastline is famous for a natural feature called the twelve apostles – sandstone sentinels standing just off the coast. The area is also renowned for its magical forests and magnificent beaches.

**Great Ocean Road**

The Great Ocean Road is 300km of sweeping asphalt running along the south-western coast of Victoria, Australia. The start of The Great Ocean Road is ~100km south west of the cosmopolitan city of Melbourne.

Starting in surfing town of Torquay and twisting it’s way through to Warrnambool. The road was built by nearly 3000 soldiers returning from The Great War. The soldiers worked for 14 years to complete the road. It is dedicated to their fallen comrades.

One of the finest scenic drives in the world. It takes in both bathing beaches and surfing beaches, rain forest, waterfalls, cliffs and an assortment of uniquely characterful towns

[http://www.greatoceanroad.com](http://www.greatoceanroad.com)

**Sunday 20th March 2011**

**Melbourne**

Melbourne is the capital of Victoria and is a relatively modern city which is less than 200 years old and never sits still. New futuristic designs add to the fascinating mix of architecture and ensure the skyline is constantly changing. Melbourne is very much about lifestyle. It is no huge surprise to residents that their city has been ranked as one of the world’s most livable cities.

Melbournians embrace three things in particular:

- sport (Australian Rules football is almost a religion);
- fashion (the look is chic with a dash of quirky); and
- festivals (the calendar is packed year round).

They even embrace their notoriously changeable weather. A standing joke in Australia is that Melbourne can experience four seasons in a day.

Melbourne metropolitan area has a population of just under 4 million. City of Melbourne residents enjoy a temperate climate influenced by its location at the apex of one of the world’s largest bays, Port Phillip.

Focused around a central business district, Metropolitan Melbourne's 7,694 sq km of suburbs spread more than 40 km to the south, are hemmed in by the picturesque Dandenong ranges 30 km to the east, extend up to 20 km to the north and sprawl across vast, flat basalt plains to the west.
**Evaluation**

1. **What was the best part of the tour?**

2. **Which part of the tour would you omit?**

3. **Was the transport suitable? Add any comments**

4. **Was the accommodation suitable? Add any comments**

   - Sydney – Devere Hotel Potts Point (2 nights)

   - Canberra, Pavilion Hotel on Northbourne (2 nights)

   - Wagga Wagga, Pavilion Hotel (1 night)

   - Dookie Campus University of Melbourne (1 night)

   - Melbourne Mecure Welcome (3 nights)

5. **Was the tour booklet useful? Add any comments - what other information did you need?**

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*Rank each of the activities on the tour on a 1-5 scale (1 - omit, 2 - could miss, 3 - needed, 4 - very good, 5 - essential) - Circle your answer*

**Saturday March 12**
- Brief Sydney city tour
  - 1 2 3 4 5
- Opera house tour -
  - 1 2 3 4 5

**Sunday March 13**
- Free day
  - 1 2 3 4 5

**Monday March 14**
- Sydney Fish Markets
- Sydney Basin Vegetable growers
- Fitzroy Falls National Park
- Canberra Festival

**Tuesday March 15**
- Balloon Festival
- Botanical Gardens Flora
- Wiradjuri Echoes dance
- Wiradjuri boomerang workshop
- Australian National Insect collection
- CSIRO Plant Industries
- U.S.A Embassy
- Water Issues

**Wednesday March 16**
- Springwaters Poll Dorset Stud, Boorowa
- Ardrossan Angus Stud, Holbrook
- Charles Sturt University Farm tour
- Charles Sturt University Winery
- Charles Sturt University student interaction

**Thursday March 17**
- Rice production, Leeton
- Orange Orchard, Leeton
- Vineyard, Leeton
- Pullar’s Apple and Pear Orchard, Cobram

**Friday March 18**
- Dookie (growers farm day)
- Tahbilk Winery structured Tasting
- Tahbilk Vineyard tour

**Saturday March 19**
- Dairy @ Cobden
- Lunch @ Port Campbell
- Loch Ard Gorge, Great Ocean Rd
- 12 Apostles, Great Ocean Rd
- Lorne beach stop Great Ocean Rd

**Sunday March 20**
- Melbourne City Orientation Tour
- Free day

**Other comments**: i.e. Did you get value for your money? Did you get enough leisure time? Was there enough time to do clothes washing / shopping?

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