All Souls St Gabriels School

Year 10 Advanced Mathematics Semester 2 Assignment

TASK IDENTIFIER	STUDENT NAME	TEACHER NAME
2.1	Katie Core	Miss Marley

TOPICS	GENRE	SITTING DATES:
Data	Report	Issued: 08·08·14 Draft Due: 18·08·14 (4pm) hardcopy Final Due: 25·08·14 (4pm) electronic

TASK CONDITIONS

TIME ALLOWED: 3 weeks (Two weeks in Class)

INSTRUCTIONS TO STUDENTS:

1. You must adhere to All Souls St Gabriel's Assessment Policy.
2. Any submitted work is to be typed
3. Show full working and/or reasoning/justification at all times.
4. Present your work neatly and use correct grammar, punctuation and spelling.
5. Use of a calculator is permitted.
6. Grades will be awarded according to the marking criteria grids
7. Your name must be on the front of this paper and on all separate pages of work submitted.

CCE's

Recalling/remembering, Graphing, Calculating with or without calculators, Substituting in formulae, Extrapolating, Sketching/drawing, Structuring/organising a mathematical argument, Setting out/presenting/arranging/displaying, Applying strategies to trial and test ideas and procedures, Applying a progression of steps to achieve the required answer

RESULTS

U&F	PS&R

TEACHER COMMENTS

Part B Maths Assignment

Katie Core

1. Introduction:

To investigate the cotton industry in Australia, data has been collected to use in a statistical analysis and various graphs. In the year 1788 cotton seeds were first bought to Australia by Governor Phillip, on the First Fleet. Cotton didn't grow well in Sydney because of the climate, so it was moved to Wee Waa, NSW where over the next year they had 3000 hectares growing. In the 1960s Darling Downs, QLD became a successful growing area. By 1991 Australia was the fourth largest cotton exporter in the world. In 1992 world record lint yield in Australia led to a record 2.2 million bale crop. In 1995 the drought caused harvest to fall to 1.5 million bales, but in 2000 it reached a massive 3.4 million bale crop, setting a new record. The worst drought occurred in 2002-2004, causing a 60% reduction in crop size. The value of Australian raw cotton exports in 2011 was $1,369 million.

2. Aim:

To investigate the area of NSW and QLD which has been harvested and to find out the lint yield and cottonseed production of NSW and QLD within the past decade.

3. Hypothesis:

Over the last decade NSW has produced more cottonseed than QLD, but Queensland has produced a better lint yield than NSW.

4. Method:

1. Collect all data for the investigation from DAFF on the 2 spreadsheets provided.

2. Choose a hypothesis that can either be proved or disapproved.

3. Use only the data you need to prove/disapprove your hypothesis and perform a statistical analysis (mean, median, mode, max, min, range, upper quartile, lower quartile, interquartile range) on it by using excel.

4. To make sure the formulas are correct for the statistical analysis, highlight the results and press Ctrl ~.

5. Insert a few different graphs that use the data needed to prove/disapprove the hypothesis, making sure that each graph shows different points of view.

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4. To make sure the formulas are correct for the statistical analysis, highlight the results and press Ctrl ~.

5. Insert a few different graphs that use the data needed to prove/disapprove the hypothesis, making sure that each graph shows different points of view.

6. Now do a report that includes an introduction on cotton, an aim, hypothesis, method, results, analysis, conclusion and a bibliography. Make sure to include all excel spreadsheets and graphical displays in report as well.

5. Results
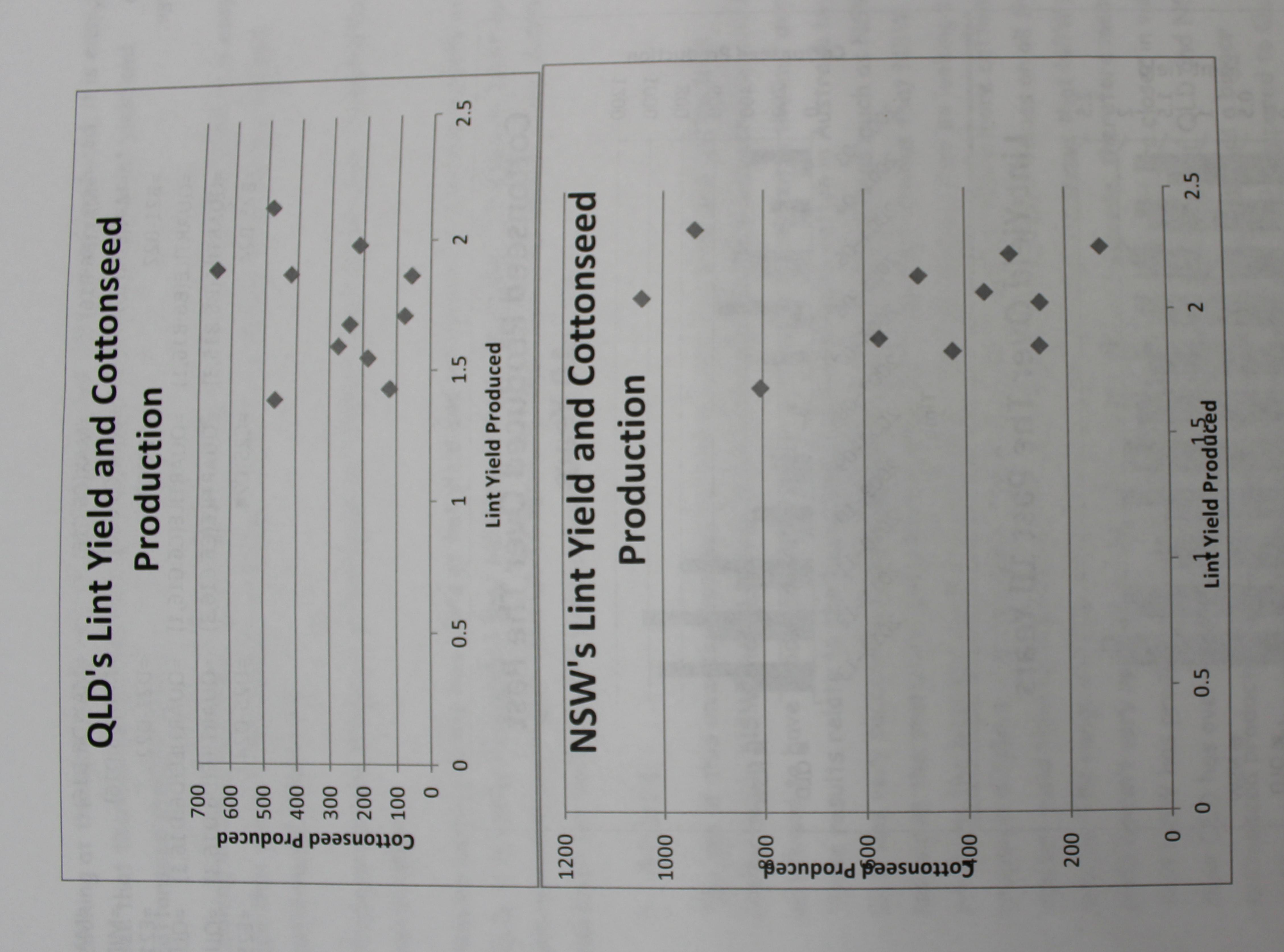
| | Lint Yield | | | Cottonseed Production | | |
	NSW	QLD	AUSTRALIA	NSW	QLD	AUSTRALIA
	t/ha	t/ha	t/ha	kt	kt	kt
2002–03	1.83	1.43	1.724	425.3	120.5	545.8
2003–04	1.849	1.68	1.763	254.2	239.6	493.7
2004–05	2.136	1.881	2.011	491.8	420.5	912.3
2005–06	1.883	1.597	1.779	570.6	273.8	844.4
2006–07	2.223	1.71	2.099	311.1	76.7	387.8
2007–08	2.252	1.864	2.12	131.3	56.5	187.8
2008–09	2.024	1.987	2.007	252	213.6	465.5
2009–10	2.067	1.549	1.857	361.9	185.1	547
2010–11	1.689	1.396	1.569	805.2	464.2	1 269.4
2011–12	2.057	1.907	1.996	1 041.5	650.2	1 693.5
2012–13	2.335	2.146	2.267	935.9	481	1 416.9

Mean	2.031364	1.740636	1.926545	453.93	289.2455	548.0375
Median	2.057	1.71	1.996	393.6	239.6	519.75
Mode	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Max	2.335	2.146	2.267	935.9	650.2	912.3
Min	1.689	1.396	1.569	131.3	56.5	187.8
Range	0.646	0.75	0.698	804.6	593.7	724.5
Q1	1.866	1.573	1.771	268.425	152.8	446.075
Q3	2.1795	1.894	2.055	550.9	442.35	621.35
IQR	0.3135	0.321	0.284	282.475	289.55	175.275

Mean	=AVERAGE(B6:B16)	=AVERAGE(C6:C16)	=AVERAGE(D6:D16)	=AVERAGE(E6:E16)
Median	=MEDIAN(B6:B16)	=MEDIAN(C6:C16)	=MEDIAN(D6:D16)	=MEDIAN(E6:E16)
Mode	=MODE(B6:B16)	=MODE(C6:C16)	=MODE(D6:D16)	=MODE(E6:E16)

Max	=MAX(B6:B16)	=MAX(C6:C16)	=MAX(D6:D16)	=MAX(E6:E16)
Min	=MIN(B6:B16)	=MIN(C6:C16)	=MIN(D6:D16)	=MIN(E6:E16)
Range	=B21-B22	=C21-C22	=D21-D22	=E21-E22
Q1	=QUARTILE(B6:B16,1)	=QUARTILE(C6:C16,1)	=QUARTILE(D6:D16,1)	=QUARTILE(E6:E16,1)
Q3	=QUARTILE(B6:B16,3)	=QUARTILE(C6:C16,3)	=QUARTILE(D6:D16,3)	=QUARTILE(E6:E16,3)
IQR	=B25-B24	=C25-C24	=D25-D24	=E25-E24

Cottonseed Produced Over The Past 10 Years

Lint Yield Over The Past 10 Years

QLD's Lint Yield and Cottonseed Production

Y-axis: Cottonseed Produced (0, 100, 200, 300, 400, 500, 600, 700)
X-axis: Lint Yield Produced (0, 0.5, 1, 1.5, 2, 2.5)

NSW's Lint Yield and Cottonseed Production

Y-axis: Cottonseed Produced (0, 200, 400, 600, 800, 1000, 1200)
X-axis: Lint Yield Produced (0, 0.5, 1, 1.5, 2, 2.5)

Looking at the graphical display of how much lint yield NSW and QLD produce each year, it can be concluded that NSW has produced more lint yield than QLD every year for the last decade.

Looking at the graphical display of how much cottonseed NSW and QLD produce every year, it can be concluded that NSW produces the most cottonseed every year for the last decade.

Looking at the scatter plot of QLD's Lint Yield and Cottonseed Produced, it is easy to see that there is no correlation in the relationship between QLD's lint yield and cottonseed production.

Looking at the scatter plot of NSW's Lint Yield and Cottonseed Produced, it is easy to see that there is no correlation in the relationship between NSW's lint yield and cottonseed production.

These points are shown on all the graphical displays that use the data collected for the investigation.

Also by looking at the box plots of lint yield and cottonseed production in NSW and QLD, it is easily recognised that NSW's minimum, lower quartile, median, upper quartile and maximum are higher than QLD's minimum, lower quartile, median, upper quartile and maximum for both the lint yield and cottonseed produced.

6. Analysis:

The aim of this investigation was to compare the lint yield and cottonseed production in NSW and QLD over the last decade. The aim was achieved and NSW was found to have produced the best lint yield and cottonseed in the last decade. These results relate to the background information on cotton in Australia by how QLD was very successful in growing cotton but just not quite as much as NSW. By looking at the statistical analysis it is starting to become obvious that NSW produces the best lint yield and cottonseed than QLD does. Also by looking at all 3 graphical displays it is very easy to see that NSW does produce more cottonseed and lint yield than QLD because of NSW always having higher values on all the graphs. The range of QLD and NSW's lint yield production shows that NSW's lint yield doesn't vary as much as QLD's has over the last decade, therefore meaning that NSW has produced amounts of lint yield each year that are closer in values than QLD has over the last decade for every year. The range of QLD and NSW's cottonseed production shows that over the last decade NSW has a bigger difference in the amount of cottonseed produced each year compared to QLD. If the data collected wasn't correct or the wrong information had been used in the graphs, it could have led to big mistakes or errors throughout the investigation. This investigation could have been further extended if the cost of planting and maintaining cotton in NSW, QLD and in other countries was investigated and data was collected was this. The effectiveness of this investigation was fairly good. It was quite easy to work with the data collected because you could work specifically with different parts of the data to investigate the hypothesis and the data collected was quite accurate.

7. <u>Conclusion:</u>

It can be concluded that NSW produces ~~the best~~ better lint yield and cottonseed than QLD. This was determined by looking at the statistical analysis, graphical displays and written results. Therefore the hypothesis should be refuted because NSW produces the best cottonseed and more lint yield than QLD.

8. <u>Bibliography:</u>
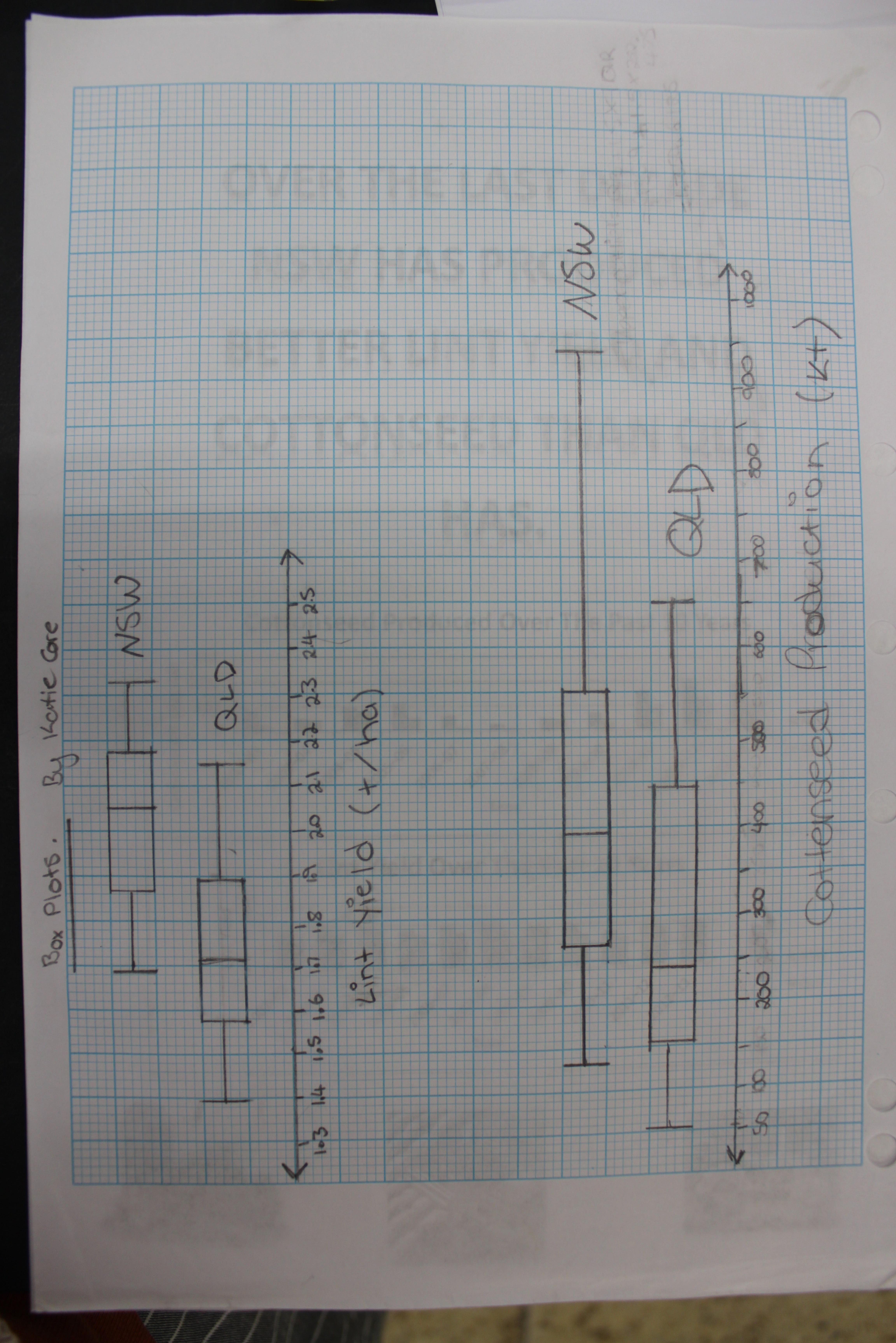
http://data.daff.gov.au/data/warehouse/agcstd9abcc0022013/ACS2013_Cotton_Tables_v1.0.0.xls

http://www.nff.org.au/commodities-cotton.html

http://www.cottoncrc.org.au/communities/Cotton_Info/History_of_Australian_Cotton

http://rochedalss.eq.edu.au

Box Plots.   By Katie Gore

NSW

QLD

Lint Yield (t/ha)

1.3 1.4 1.5 1.6 1.7 1.8 1.9 20 21 22 23 24 25

NSW

QLD

Cottonseed Production (kt)

50 100 200 300 400 500 600 700 800 900 1000

OVER THE LAST DECADE NSW HAS PRODUCED BETTER LINT YIELD AND COTTONSEED THAN QLD HAS.

Cottonseed Produced Over The Past 10 Years

Lint Yield Over The Past 10 Years