2007 TAIWAN INTERNATIONAL SCIENCE FAIR

CATEGORY : Environmental Science

PROJECT : The Grapes of Math

AWARDS : Environmental Science Third Award

SCHOOL : Ashcroft Secondary School

FINALISTS : Sarah O’Connor

COUNTRY : Canada

Environmental Sciences
The Grapes of Math
Sarah O'Connor
Canada

Purpose:

This project determined which varietal of grapes grew best in the Lytton / Lillooet area. This project specifically measured growth rates, maturity levels, and breakage rates of the 18 grape varietals (9 red, 9 white) that grew on different slope positions. This experiment determined which varietal was best suited for the site specifically chosen in Lillooet and provided a ranking of the most desirable varietals for potential grape growers.

Hypotheses:

1a. The height of the grapes will be different for each varietal.

1b. The vines at the top of the slope will have a slower growth rate than those at the bottom of the slope.

2a. The amount of mature wood will vary between varietals.

2b. The Vines at the top of the hill will have a slower maturity development than those at the bottom of the slope.

3a. Some varietals will be more prone to breakage.

3b. The plants at the top of the slope will be more susceptible to breakage.

Procedure:

1. For each of the 18 varieties, data was collected for 50 replications of each variety by measuring the height, maturity and whether the vine was broken or unbroken. Seven rows had one plant missing.
2. The total heights from the ground to the highest point on the vine were measured with a tape measure. Measurements were in centimeters.
3. Maturity (amount of wood formation) was measured in centimeters using a tape measure. It was determined by measuring from the ground to the top of the wood formation.
4. Whether the plant was broken or unbroken was recorded at the time of measurement.

All the data was entered in Microsoft Excel and the Analysis of Variance (ANOVA) was performed to determine if there was a significant difference between the results of each variable between varieties and slope position. This was followed by Duncan's Multiple Range Test to specifically determine which varietals were different.

Results:

For all the varietals, there was a statistically significant difference for the mean height, mean maturity and breakage rates. Since all of the varietals have a different genotype, it's fair to state that genetics play an important role in determining the plants performance.
Slope position did not have an effect on performance of height growth, maturity and breakage rates. While slope position did not have an effect on this site, it could have an effect on other sites in the Lytton / Lillooet area.

In order to make recommendations to potential grape growers, a ranking system was developed to determine the most desirable varietals based on the heights, maturity, and breakage rates. The three most desirable varietals for this project were Riesling Muscat, Muscat Ottonel, and Pinot Gris.

Conclusion:

For potential grape growers in the Lytton / Lillooet corridor, it is important to consider which grape varietal should be chosen to be grown. This project shows that some varieties of grapes have significantly better or worse performance with regards to the height, maturity and breakage rate. Correct choice of variety is important to the economics of any grape growing operation.

評語

本研究對不同之葡萄品種和地域做了完整之統計分析。