CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)

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Project Number

S1703

Project Title

Micropropagation of Explants from Mature Tissue of Quercus lobata

Abstract

Objectives/Goals

This study was undertaken to evaluate the optimum protocol for micropropagation using 1-year-old and 2-year-old plant tissue for the regeneration of valley oak in vitro.

Methods/Materials

Acorns were collected and germinated under clinical conditions during the fall of 2005, 2006, and 2007. Stem segments with a single axillary bud were obtained from six-month-old,one-year-old, and 2-year-old the valley oak seedlings. Each explant was cut to a length of approximately 1 cm, retaining the axillary bud, and placed in a petri dish containing 35 ml of Lloyd and McCown culture medium. The number of shoots on each explant was recorded after six and nine weeks. Statistical analyses were completed with the Statistical Analysis System.

Results

To investigate the germination of the Valley Oak qualitative accounts of the explants# growth were taken along with a quantitative analysis of shoot numbers. The initial initiation for each group tested tissue (6-month old tissue; 1 year old tissue; and 2-year old tissue) began with 6 explants each. As suspected the immature tissues of the six month old nodule segments appeared to be the healthiest and were easily sub-cultured. From initiation through four separate sub-cultures the 6-month old tissue produced 36 shoots in total (Fig. 2) This was due in fact to a large amount of shoot growth, although explants were either successful or were overtaken by contamination. While the one year explants did germinate and produce healthy stems their numbers were not as great as the six month old explants in that we began with 6 explants and ended up with 18 sub-cultured shoots. Oddly, the two year nodules survived and thrived. They produced 122 shoots by the end of the fourth sub-culturing.

Conclusions/Discussion

In conclusion, the data supported the hypothesis that the Lloyd & McCown Woody Plant Basal Medium with Vitamins will be an effective medium to use in the micropropagation of tissue ranging in age of 1 and 2-year-old of Valley Oaks (Quercus).

Summary Statement

This research evaluated the proper protocol and media for various ages of the explant tissue in the micropropagation of Quercus lobata.

Help Received

Lab equipment located at the North High Agriculture Department's tissue lab was used. Direction and assistance was given by Dr. Eric Mercure and Christine Dickson.