

Yakima Chief Ranches Technical Team

Zillah, Washington

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Introduction

This summer, I have spent my time as a research intern at Yakima Chief Ranches (YCR). YCR is a plant research and brand management company that specializes in breeding new hop varieties. They have just moved their base of operations from the farm of a grower owner in Toppenish, Wa to a new facility in Zillah, Wa. This new facility, once it is fully operational, will include a pilot brewery, a lab capable of tissue culture and molecular genetics work, and a full-scale propagation facility with greenhouses and cold frames for the growth of plants. As a brand management company, YCR works to propagate its commercial varieties so there is enough plant material for growers. This has been one of the big reasons for the move, in order to limit dealing with third party propagators.

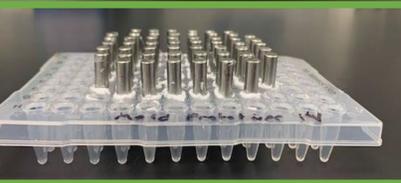
Internship Responsibilities

I worked in the lab for YCR as a research intern. My responsibilities included designing experiments, creation of prototypes and general upkeep of the lab

- Research:
 - Development of a protocol for cryopreservation
 - One of the big projects of the lab is development of a germplasm repository. Under normal conditions, germplasm requires maintenance every so often, but cryopreservation would greatly reduce the amount of labor dedicated to this as well as the chances for mutations. Therefore, maintaining a genetically pure repository without the need for maintenance.
 - I was responsible for beginning to develop a protocol for the process of cryopreservation. To do this I:
 - Performed literature review to know what methods had been used before
 - Designed experiments to find a method that would be scalable to our needs
 - Created prototypes to assist in the process
 - I did not complete an entire protocol, but I laid a foundation for someone else to continue where I left off.
 - Development of a protocol for shoot organogenesis in hops and hemp
 - Organogenesis of plants is a goal that, once fulfilled, could open many doors for research and propagation of plant material.
 - I was responsible for beginning work on the development of a protocol for organogenesis in both hops and hemp. To do this I:
 - Worked with others on the technical team to decide what may have worked in the past
 - Developed tissue culture media recipes
 - Designed experiments
 - Although I was not able to see m experiments all the way through and someone will have to continue once I leave, I did get several instances of success and feel that the work will be able to be continued once I have fully left.
 - Optimization of a nucleic acid extraction protocol
 - Nucleic acid extractions are necessary for many things in the realm of molecular genetics so, optimization of the protocol is essential to YCR diving deeper into this area.
 - I was supposed to start working on performing experiments to optimize this protocol, but, because of the lack of supplies available, I only really got a chance to practice a couple of extractions and evaluate their quality.
 - Most of my time spent on this project was just learning which I also found very exciting
- Lab upkeep:
 - Dishes
 - Micropropagation of commercial varieties
 - Media making
 - General clean up

My Growth

Working with the technical team at YCR has been a great opportunity for development. Not only was I being taught how to perform a lot of tasks I have been learning about in school, but I have also been able to get experience doing research in my field. As someone who hopes to pursue a graduate degree in something like molecular genetics or plant physiology, being given larger projects with goals that I was able to work towards all summer gave me a taste of what doing graduate research could be like. This also applies to the future of my professional career. I hope to one day work with hops in a similar manner. This internship was able to give me a head start on honing the skills I will need in that line of work. This internship was really a good way for me to draw connections between what I learned in school And what the real world will be like for me. I could not think of a better way to spend my summer.



Figures 1 (top left), 2 (bottom left) and 3 (Right). The most recent mold prototype that was created (figures 1 and 2) and an example of the form agar takes when it is used (figure 3).

Figure 4. The molecular biology room in the lab. This is where I did all my work with nucleic acid extractions.



Figure 5. Examples of encapsulated plant tissue for cryopreservation



Figures 6 (Left) and 7 (Right). Examples of the shoot organogenesis of hops that I was going for.



Figure 8. The tissue culture grow room at YCR.

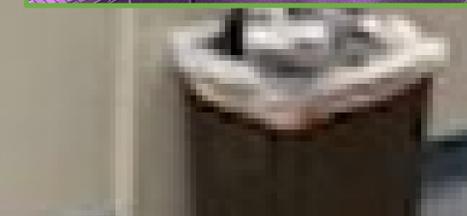


Figure 9. One of the laminar flow hoods where aseptic work is done

