

Innovative Extension Using Epoxy Resin Displays and Time Lapse Photography



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Abstract

Agricultural extension is often more impactful if it relies on showing and demonstrating, as opposed to only telling. Using fresh plant materials in demonstrations and digging root pits for field days are two common extension resources currently used by ag researchers. Fresh plant material makes excellent extension content, particularly for showing leaf diseases. They can be passed around at grower meetings or field days and participants can see, touch, and feel the characteristics of a particular disease or weed. Unfortunately, however, they tend to degrade quickly, rely on time sensitive in-field collection, and are often season specific. Another common extension tool are root pits, which provide a great way to visualize the above and below ground portions of sugarbeets simultaneously. However, it is time consuming to dig and carefully wash the soil away to expose the roots. They are also immovable, and permanently disturb the soil footprint they are dug upon. To overcome the challenges of these extension materials, we developed methodologies for preserving fresh sugarbeet and weed plant material in epoxy resin blocks, and for using time lapse photography to show the above and below ground portions of a sugarbeet grown in custom-built plexi-glass boxes. Both of these methods have been very well received at grower meetings and field days. They can also be further customized and developed in the future.

Plexi Glass Display and Time Lapse Methods Development

Current Methods for displaying plant material are... Destructive, labor intensive, and degrade over time.



Problems we had with our initial designs



Heavy Boxes



Weather Restrictions



Complicated Setups



Lighting



Healthy Growth



Image Quality



Crowding

Resin Results

Nothing beats fresh samples of sugarbeets to educate someone that is unfamiliar with different diseases or pests. With resin, you can now extend the life of that sample. This method requires a slow low-heat clear curing resin. A quick cure resin will burn leaves, and you'll have an orange hazy finish. For the best bubble free results cure samples in small batch pours with 40 lbs. of pressure until resin hardens. The longevity of samples is still to be determined. We have noticed a change in color in some of our older pours.



Sugarbeet Leaf Sample



Pressurizing Resin Pour



Sugarbeet Root Magot Fly

Plexi Glass Display and Time Lapse Results



Final design

- Growth lights and Filming lights on 24/7
- EOS M50 Camera
- 2 foot by 1 foot frame
- 45% glass face
- 3,600 Photos at 2:48 min intervals every week



Using time lapse to record the competition between Palmer Amaranth and Sugarbeets

In our growing region Palmer Amaranth is a new species of weed that is a threat to sugarbeet production in Idaho. Growers are unfamiliar with this weed and struggle identifying it in the field. On the 31st of December 2025 we planted both Palmer and Sugarbeet seeds into a plexi glass display. Over the course of the next 5 weeks or 1400 growing degree days (GDD) we recorded the above and below ground growth of both plants. No additional data was collected.



GDD 280



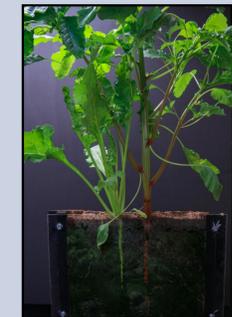
GDD 560



GDD 840



GDD 1120



GDD 1400



Time Lapse Video QR Code

Video of Palmer Amaranth competing with a Sugarbeet.

Future

- We need improved methods of preserving plant material in Resin.
- Building a playlist of sugarbeet related timelapse videos to share with growers.

Our displays in the real world



Minidoka County Fair



Amalgamated Sugar Field Day @ Hatch



CSI Campus