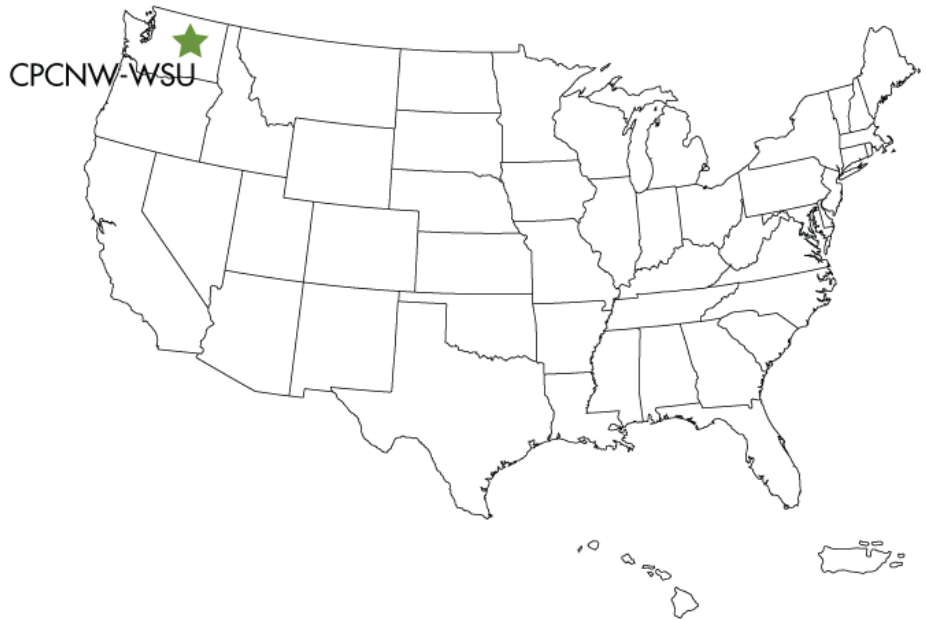




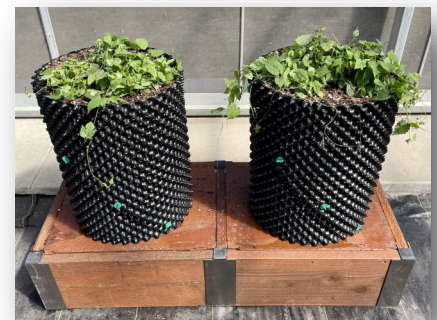
NCPN-Hops Headquartered in the Pacific Northwest U.S. Hop Growing Region

Our up-close look at the various Clean Plant Centers within the National Clean Plant Network continues in this issue of the *NCPN Network News*, as we take a look at hops. With over 99% of the United States hop production in Washington, Oregon, and Idaho, the Clean Plant Center Northwest (CPCNW) at Washington State University is an ideally central location for the NCPN-Hops Center. The combined hop growing acreage in Washington, Oregon, and Idaho yields the highest production of hops in the world. For more information on hop growing in the U.S., [visit https://cpcnw.wsu.edu/](https://cpcnw.wsu.edu/).



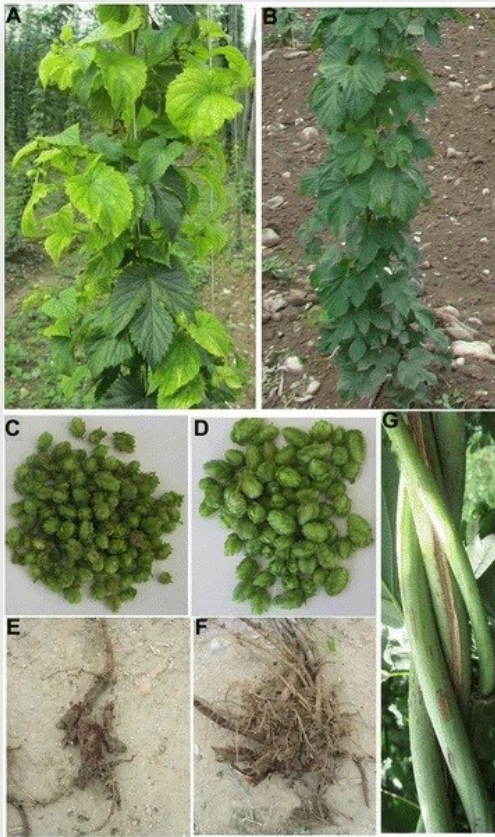
NCPN-Hops Continues to Evolve to Serve Grower Needs

Following the success of the 2022/2023 winter rhizome sale, the CPCNW's hop foundation has been updated to meet the growing demand for virus-tested propagation material. To expand and improve the yearly sale of rhizomes, the hop foundation greenhouse needed to be renovated. The Hop Center has swapped out the traditional wood-treated boxes to a raised Airpot design, allowing for more ergonomic pruning and plant maintenance throughout the year. By switching to Airpot, the production team will be able to "pop" the Airpot apart and separate rhizomes more efficiently than possible in the boxes. Additionally, the new pots and greenhouse layout allow for more hop selections to be maintained in a controlled environment as the need for publicly available material increases. Rhizomes will be available in the 2024/2025 winter sales season. Due to the renovation, selections were refreshed and replanted to meet the highest standard of virus testing available. Rhizomes will not be of a size to divide and fill orders this winter season.



The Airpot design allows the container to be opened from the side to extract root material as needed. The pots can be cleaned and reused, creating an eco-friendly alternative to traditional plastic pots.

Citrus bark cracking viroid on the move



With the recent report of Citrus bark cracking viroid (CBCVd) infecting hops in Brazil, it is important that US growers remain vigilant about the damage this disease causes.

CBCVd has been associated with a range of symptoms, including leaf yellowing and curling, premature flowering, smaller cone size, dry rot of roots, stunting and dieback, with plant death occurring 3-5 years after infection. There are no known insect vectors, so spread primarily occurs mechanically on tools via wounding and transfer of infected sap. To date, CBCVd has not been observed or reported in US hops. For more information or concerns, please reach out to cpcnw@wsu.edu.

CBCVd has been associated with a range of symptoms, including leaf yellowing and curling (Figure A), premature flowering (Figure B), smaller cone size (Figure C & D), dry rot of roots (Figure E & F), stunting and dieback (Figure G), with plant death occurring 3-5 years after infection.

NCPN-Hop Webinar Coming Soon

During the July meeting, the crop committee determined a need to organize and host a best management practices-focused webinar. The webinar will highlight the NCPN-Hop clean plant centers, virus identification, emerging pressures, best-management practices, and state certification. A working group has been formed and is set to meet this month (November) to establish additional topics, determine timeframes, and how to raise awareness. Please look for more information will be shared in the coming months.

Upcoming Winter Meeting

The NCPN-Hop winter meeting will be on **Tuesday, January 16, 2024, 1:30 p.m. – 3:00 p.m.** (Central Standard Time). The meeting will be held during the Winter Hop Research Council and American Hop Convention in Frisco, Texas. There will be both an in-person and Zoom option for attending the meeting. Please get in touch with the NCPN-Hop coordinator, Tanner Hunt, at tanner.white@wsu.edu with any questions.



Collaboration between USDA-ARS Hop Breeding Program and CPCNW

Traditionally, the hop clean plant program in Prosser, Washington receives breeding lines that show promising traits and are entering phase-two or phase-three trials before being made publicly available. That way, there is clean planting stock available when the variety, like the recent USDA-ARS releases ‘Triumph’ and ‘Vista’, are made commercially available to propagators across the country. But hop viruses and viroid infection affects the growth and development of the bine, and most importantly, the mass and chemical composition of the hop cones. Infected hops may lead to skewed interpretations of a line’s traits, as well as performance in breeding and development.

Therefore, the CPCNW and the USDA-ARS hop breeding program have a cooperative agreement in place to study the parental lines used by the latter, determining infection status, and cleaning up high-priority lines for use in breeding crosses. This collaboration also provides the opportunity to examine transmission of viruses through pollen and seed in hops, to better understand how these pathogens become common around the world.



The virus elimination process for hops is done almost entirely under tissue culture conditions. This depicts the growth progression from initial hop meristem to finished plantlet.

A New NCPN-Hop Vice-Chair begins January 2024

The NCPN-Hop crop committee welcomes a new vice-chair. The committee membership has selected Cameron Fox from Skagit Horticulture to serve the next two years as the committee’s vice chair. Cameron has served many years on the committee as the voting representative for “At-Large Grower” and remains a strong advocate for NCPN-Hops and the Clean Plant Center Northwest. His official term begins January 1, 2024, and he will be instrumental in crafting the topics discussed at the winter meeting.



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