Citrus Clonal Protection Program (CCPP), University of California, Riverside (UCR)

» Headquarters for the National Clean Plant Network for Citrus, the Citrus Clonal Protection Program (CCPP) is a cooperative program with the UC of California, Riverside, CDFA, USDA and the California citrus industry represented by the California Citrus Nursery Board (CCNB) and the Citrus Research Board (CRB)

» The CCPP operates at 3 different facilities

1.) CCPP-Rubidoux Quarantine Facility (RQF) Riverside, CA for the biological detection of citrus pathogens & the execution of citrus therapeutics

2.) CCPP- Citrus Diagnostic & Research Laboratory (CDRL) testing of citrus nursery stock & trees in a robust, high throughput diagnostic laboratory, requires the identification & characterization of citrus pathogens via high throughput sequencing and constantly developing novel diagnostic tools

3.) CCPP-Lindcove Foundation Facility (LFF) Foundation & Evaluation Block at Exeter, CA. Facility for trueness-to-type evaluation & budwood distribution to the industry, scientists, & citrus enthusiasts in California & around the world

USDA-ARS National Clonal Germplasm Repository for Citrus and Dates (NCGRC) California, Riverside

» The NCGRC mission is to acquire, maintain, distribute, and evaluate germplasm of citrus, date palms, and related taxa

» Acquisitions are made to preserve genetic diversity and to make this available for the improvement of citrus production

» A protected collection of pathogen-tested accessions is maintained and clean source germplasm is provided gratis to qualified researchers and clean stock programs in the US and internationally

Certified Budwood Program, Yuma Agricultural Center, University of Arizona (UA)

» Citrus germplasm distribution

» Maintain citrus germplasm under insect-resistant screen structures

Texas A&M University-Kingsville, Citrus Center (TAMU)

» Maintain citrus germplasm under insect-resistant screen structures

» Pathogen testing

» Propagation and dissemination of clean germplasm

Citrus Germplasm Introduction Program and Citrus Nursery Stock Certification Program, Florida Division of Plant Industry (FLDPI)

» Importation and quarantine services for citrus varieties in the US (CGIP)

» Assist growers in the production of superior citrus nursery stock that are pathogen-tested and disease-free (CNSCP)

» Maintenance and protection of citrus germplasm (CNSCP)

» Disease indexing and pathogen testing (CGIP and CNSCP)

USDA-ARS Exotic Pathogens of Citrus Collection (EPCC) Beltsville, Maryland

» The EPCC maintains an extensive & unique in planta collections of graft transmissible pathogens of citrus in high quality greenhouse space

» Citrus pathogen collection includes Candidatus Liberibacter species, Xanthomonas strains, Citrus tristeza virus (CTV), Citrus yellow mosaic virus, citrus chlorotic dwarf virus and other non-cultured pathogens

Louisiana State University Agriculture Center Burden Research Station (LSU)

» Maintain germplasm collection of satsuma varieties and other citrus widely grown in Louisiana

» Pathogen testing

Alabama Agricultural Experiment Station, Auburn University (AU)

» Maintain foundation block of relevant satsuma and other regionally important citrus varieties

» Pathogen testing

» Citrus germplasm distribution

Department of Plant and Environmental Protection Sciences, University of Hawaii (UH)

» Provide clean germplasm to nurseries and growers in Hawaii, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands

» Maintain Hawaii’s citrus foundation block

Dept. of Agro-Environmental Sciences, University of Puerto Rico, Mayaguez (UPR)

» Establish clean budwood sources for citrus germplasm distribution

» Maintain citrus foundation block

» Pathogen testing
Pathogen-tested foundation stock is established and maintained for germplasm preservation and to provide clean propagative material to the industry.

**Tristeza**

Tristeza quick decline (left) has killed more than 100 million citrus trees worldwide. Healthy trees (right) propagated on sour orange rootstock can die within weeks after citrus tristeza virus infection. NCPN-Citrus prevents the spread of tristeza and other diseases by providing a source of clean planting stock.

**Importation**

Citrus cultivars from foreign and domestic sources are constantly screened to prevent accidental introduction of exotic citrus diseases. Citrus germplasm are tested for graft transmissible pathogens.

**Distribution**

Clean propagative material is provided to citrus nurseries, commercial growers, and citrus enthusiasts throughout the United States and the world.

**Therapy**

Pathogens are eliminated using thermal therapy and/or shoot tip grafting.

**Foundation**

Pathogen-tested foundation stock is established and maintained for germplasm preservation and to provide clean propagative material to the industry.

**Diagnostics**

Nursery stock and trees are constantly tested in state-of-the-art diagnostic laboratories that implement next generation sequencing to identify and characterize various citrus pathogens.

**Outreach**

Outreach programs are developed to educate the industry and public on the importance of using clean citrus propagative materials.

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The National Clean Plant Network for Citrus (NCPN-Citrus) is a body of researchers, extension specialists, state regulatory personnel and industry stakeholders from California, Florida, Texas, Arizona, Alabama, Louisiana, Hawaii and Puerto Rico.

NCPN-Citrus has established or enhanced quarantine and germplasm programs in all of the major citrus producing states to facilitate the importation, testing, therapy, and release of pathogen-tested citrus to nurseries, growers, and the public.

NCPN-Citrus maintains/makes available to the public an extensive collection of ancient and newly developed citrus varieties from around the world suitable for any use, including juice, fresh fruit and ornamental landscapes.

NCPN-Citrus connects 10 Citrus Centers in 9 US states and territories. NCPN-Citrus will ensure that high quality (true-to-type) citrus propagative materials are produced (therapy & diagnostics), maintained (management & retesting of foundation blocks & nursery sources), and distributed throughout the USA under the standards of excellence established by the NCPN governance.

NCPN-Citrus was established in 2010 and is part of the national network of clean plant centers concerned with the health of vegetatively propagated specialty crops.

Nationalcleanplantnetwork.org

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