Graft-transmissible plant pathogens – viruses, viroids, phytoplasmas and bacteria – are spread through infected propagation material and can cause substantial economic loss due to lower yields, decreased product quality, and higher management costs. The best control strategy is prevention by using planting material derived from clean, foundation plant stock free of deleterious pathogens.

The National Clean Plant Network (NCPN) centers and programs screen plant materials for selected pathogens, eliminate those pathogens, and produce, maintain and distribute pathogen-tested plant materials. Currently, the crops covered by NCPN centers include fruit trees, grapes, berries, citrus, hops, sweetpotatoes, and roses. How important is the production and use of clean foundation stocks for profitability of these specialty crops? Existing studies and knowledge gaps are identified to determine the future direction of NCPN efforts.

Economic Value of Clean Plants and Clean Plant Programs

Studies have estimated the economic returns on using clean plant materials derived from pathogen-tested foundation stocks and on supporting clean plant centers and programs. Some of the benefits are listed below:

- In citrus in Florida, $4.51 billion from citrus greening over 4 years.
- In winegrapes in New York, $10,000-$16,000/acre from grapevine leafroll disease in New York state over the life of a vineyard.
- In winegrapes in California Northern San Joaquin Valley, $12,000/acre from grapevine leafroll disease over the life of the vineyard.
- In winegrapes in California Napa County, $91,660/acre from grapevine leafroll disease over the life of the vineyard.
- In fruit trees in Pennsylvania, $30 million to growers over 10 years to eradicate plum pox virus.
• The value of using virus-tested materials to the
winegrape growers in California North Coast
region was calculated to be $22.5 million annually,
which substantially outweighed the cost of the
clean plant program at Foundation Plant Services
in Davis, CA by at least ten times.

• An analysis of producing virus-tested grapevines
in California and New York revealed a benefit-
to-cost ratio of 117 over 10 years for Foundation
Plant Services in Davis, CA and 7.2 for the younger
NCPN-Grapes center at Cornell University in

Future Research

• Economic studies are needed for the NCPN
specialty crops that have not been well studied thus
far, including berries, hops, roses, and sweetpotatoes.

• Additional economic studies are needed to
examine the more complex questions about disease
management using planting material derived from
pathogen-tested foundation stocks under different
scenarios.

• Economic studies are needed to assess the value
of clean plant materials
to nurseries in order to encourage adoption and
maintenance of certified, clean plant materials
needed by commercial producers.

• While the cost-benefits of some NCPN centers
have been studied, the cost-benefits of many
NCPN centers have not. Economic assessments of
those centers not studied yet are needed to
ensure continued support and funding from
industry and government.

• Studies are needed to identify the economic
impact of specific diseases so that resources can
be effectively allocated to mitigate their impacts.

• More and better data are needed about the
production impacts of graft-transmissible plant
pathogens in order to analyze the cost benefits of
clean stock.

• Studies are needed to evaluate how disease man-
agement actions of neighboring growers might
increase or decrease the incentive of growers to
buy planting material derived from pathogen-
tested stocks.

• Analyses of socioeconomic factors that drive
market dynamics and growers’ preferences and
actions in terms of the adoption of clean planting
material.

A Strong Case

A review of the literature found that economic studies
on NCPN crops were limited and that better production
data are needed to support future economic studies.
The studies that do exist clearly show great economic
benefits to using clean plants. These benefits include
increased production, increased product quality and
decreased production costs. Benefits have been found
at the producer level that can accrue to the industry
and consumer levels. The benefits of an NCPN center
were also demonstra-

Economics Special Initiative:
Stakeholders, economists, clean
plant center directors, and NCPN
program managers convened at
Cornell University in 2019 to discuss
existing clean plant economic
studies and determine areas for
future development. Read the
full report developed under this
initiative at: https://ucanr.edu/sites/
natcpn/files/320561.pdf.