Benefits of Early Adoption of Preventative Pruning Practices in Managing Grapevine Trunk Diseases

Partial support for this research provided through a grant from the Specialty Crop Research Initiative (SCRI) USDA, National Institute of Food & Agriculture

United States Department of Agriculture
National Institute of Food and Agriculture

Eutypa dieback

Esca

Phomopsis dieback

Botryosphaeria dieback


Eutypa dieback

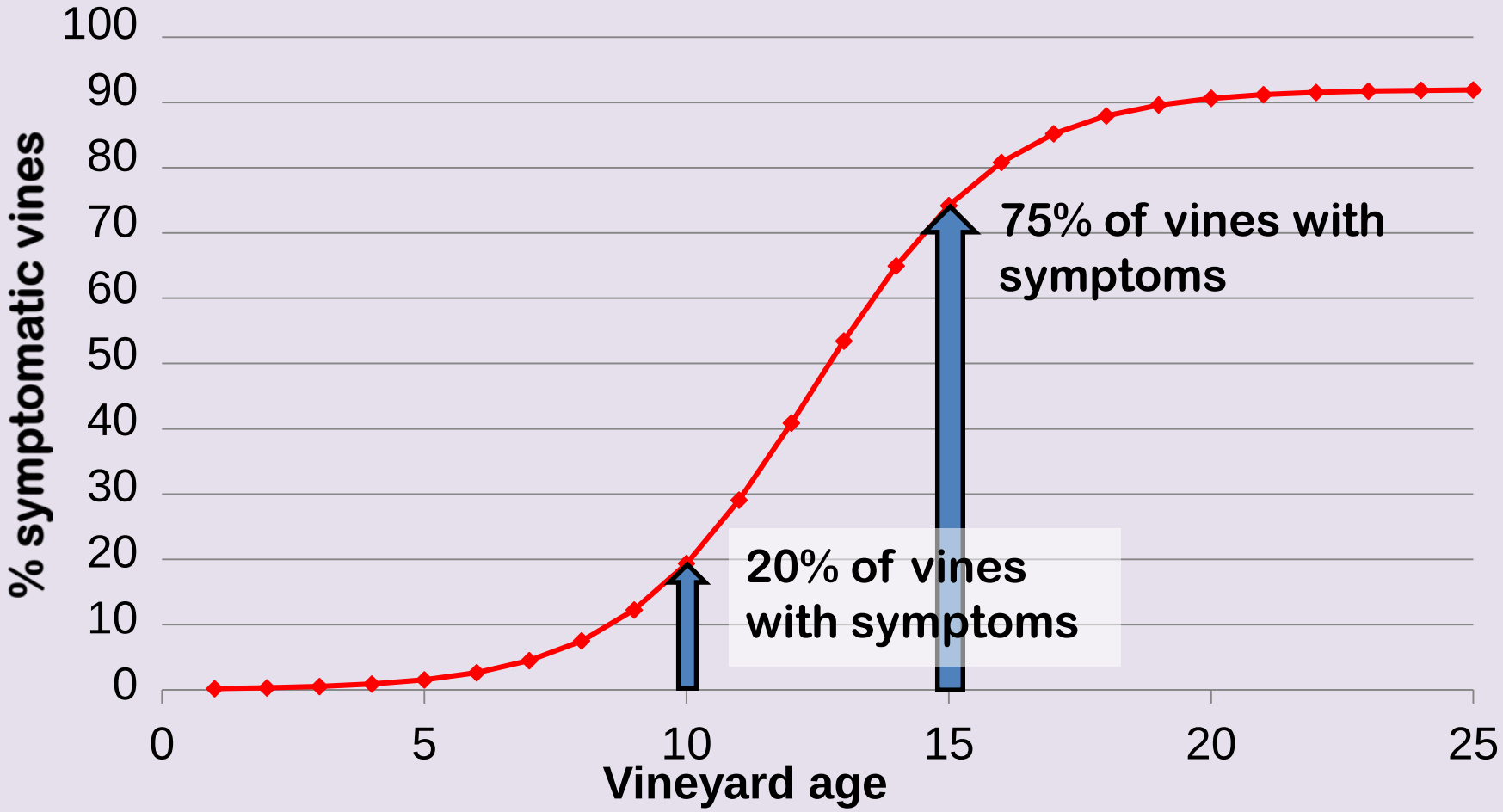

Esca


Phomopsis dieback


Botryosphaeria dieback

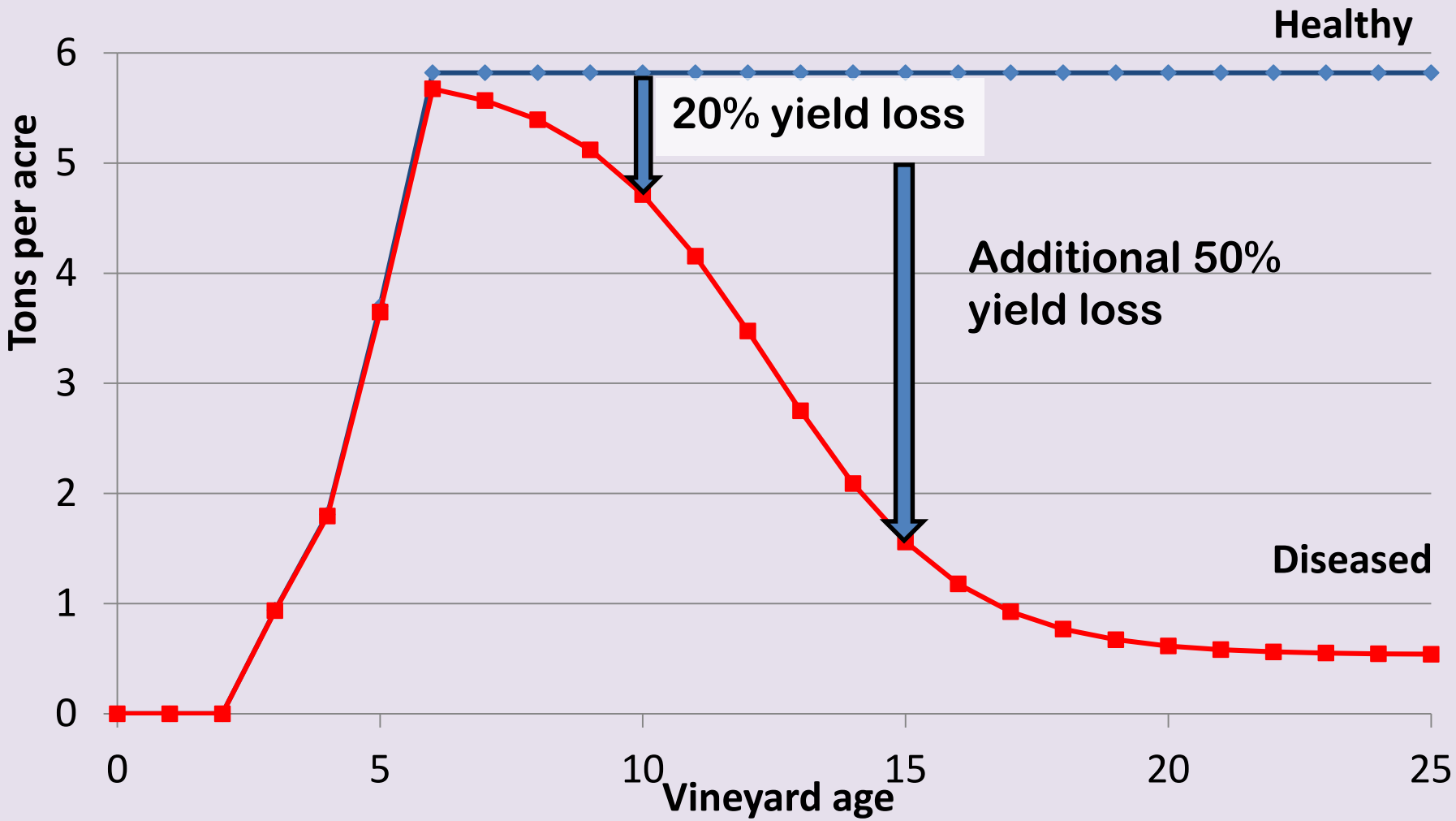
Disease incidence with vine age

(% vines w/ dead spurs, stunted shoots, symptomatic leaves)



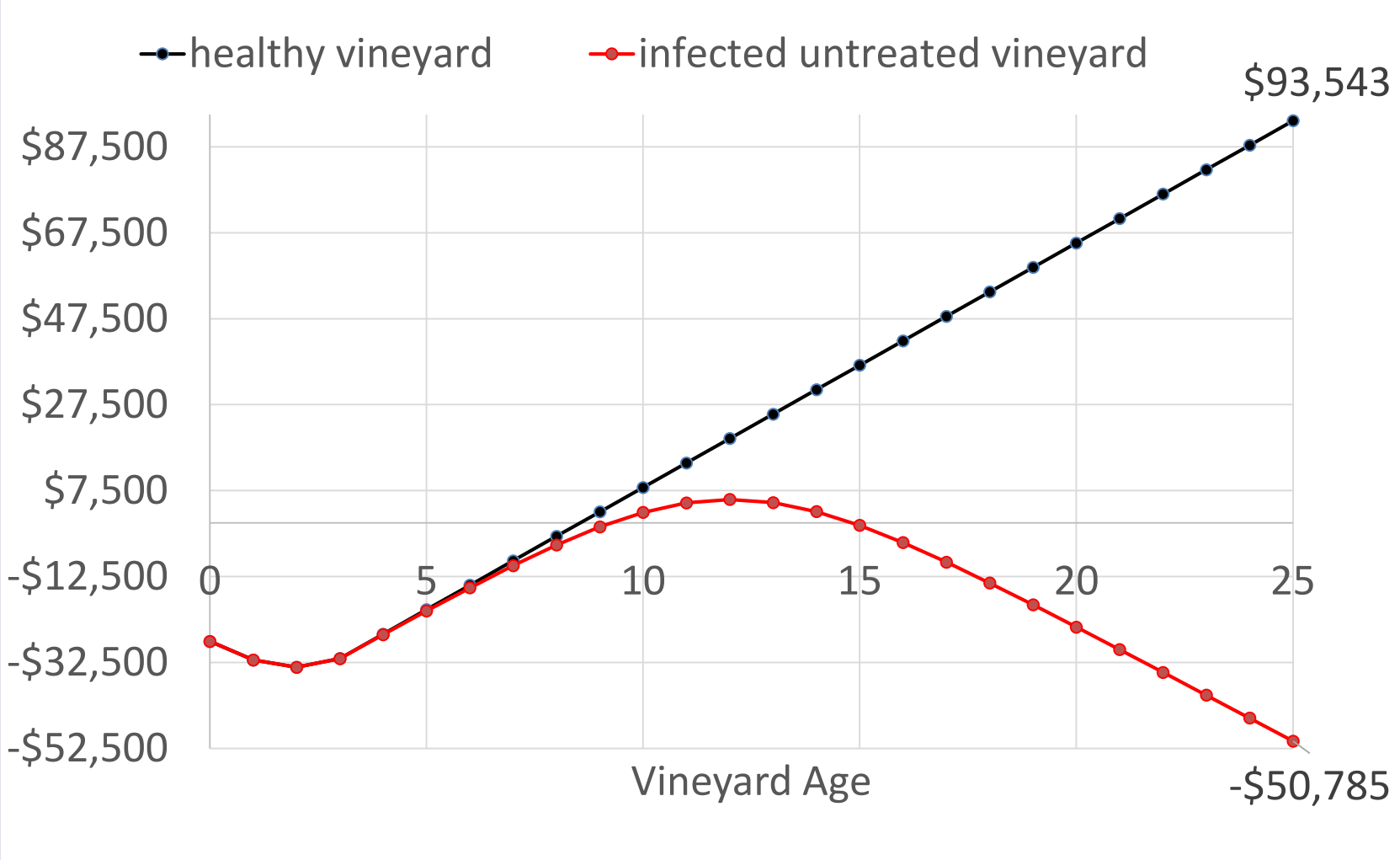
From Munkvold et al. 1994

Yield Impacts of Trunk Diseases



From Munkvold et al. 1994

Effect of Trunk Diseases on Cumulative Discounted Net Returns per acre



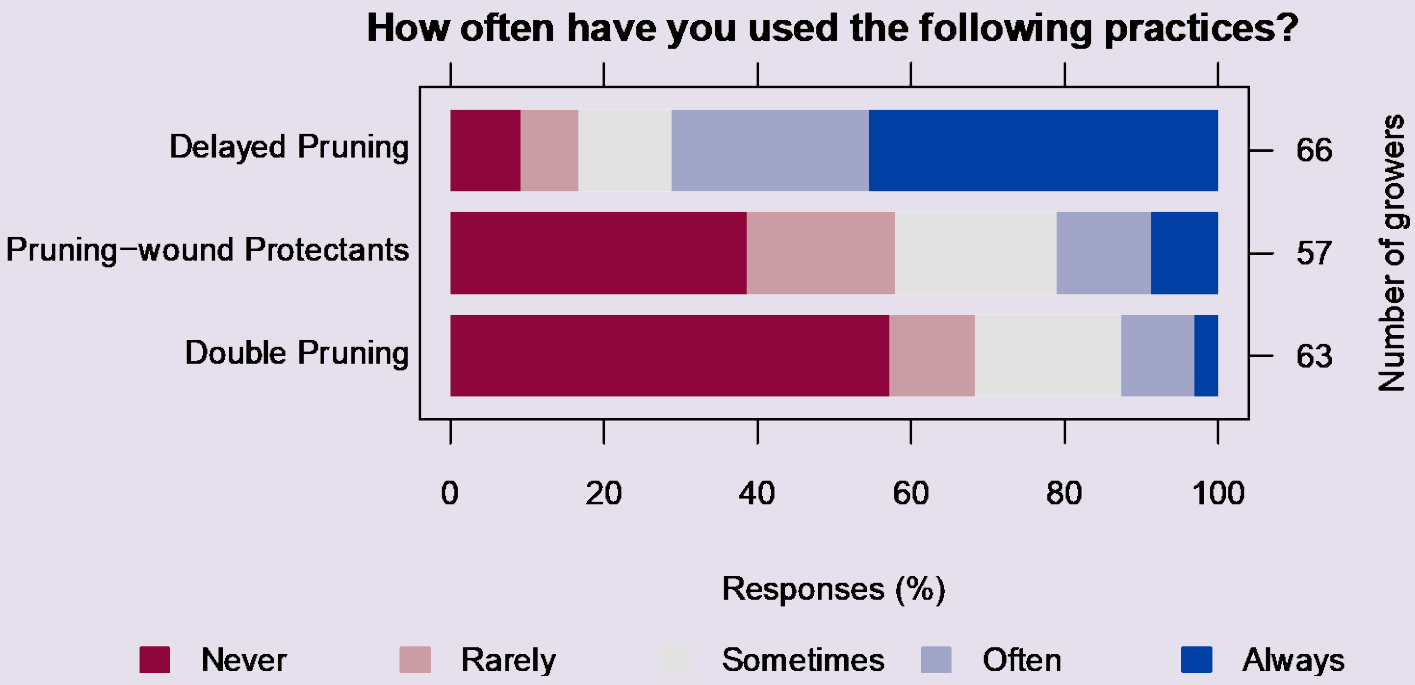
Remedial Vine Surgery

Pho

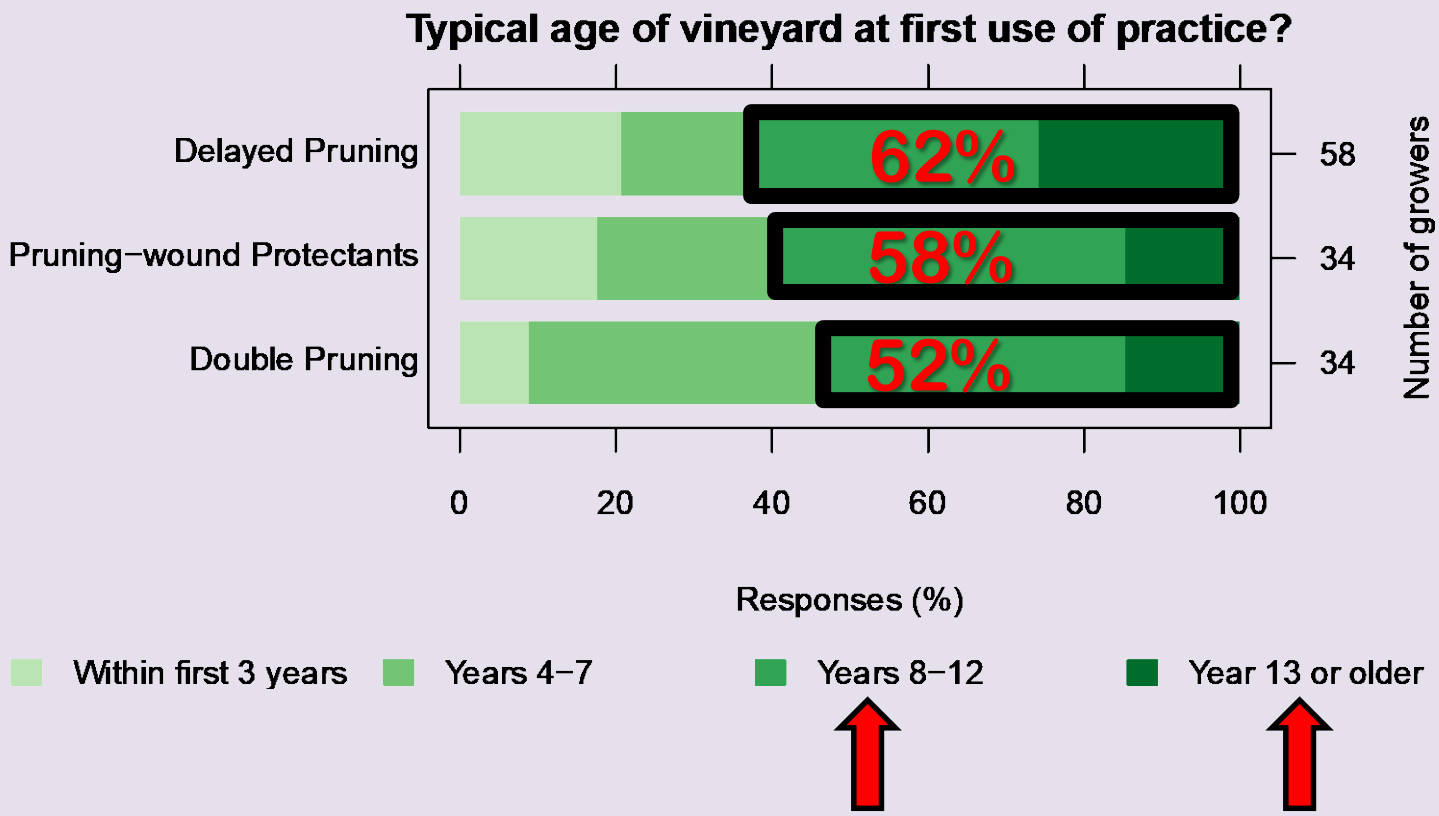
Preventative practices

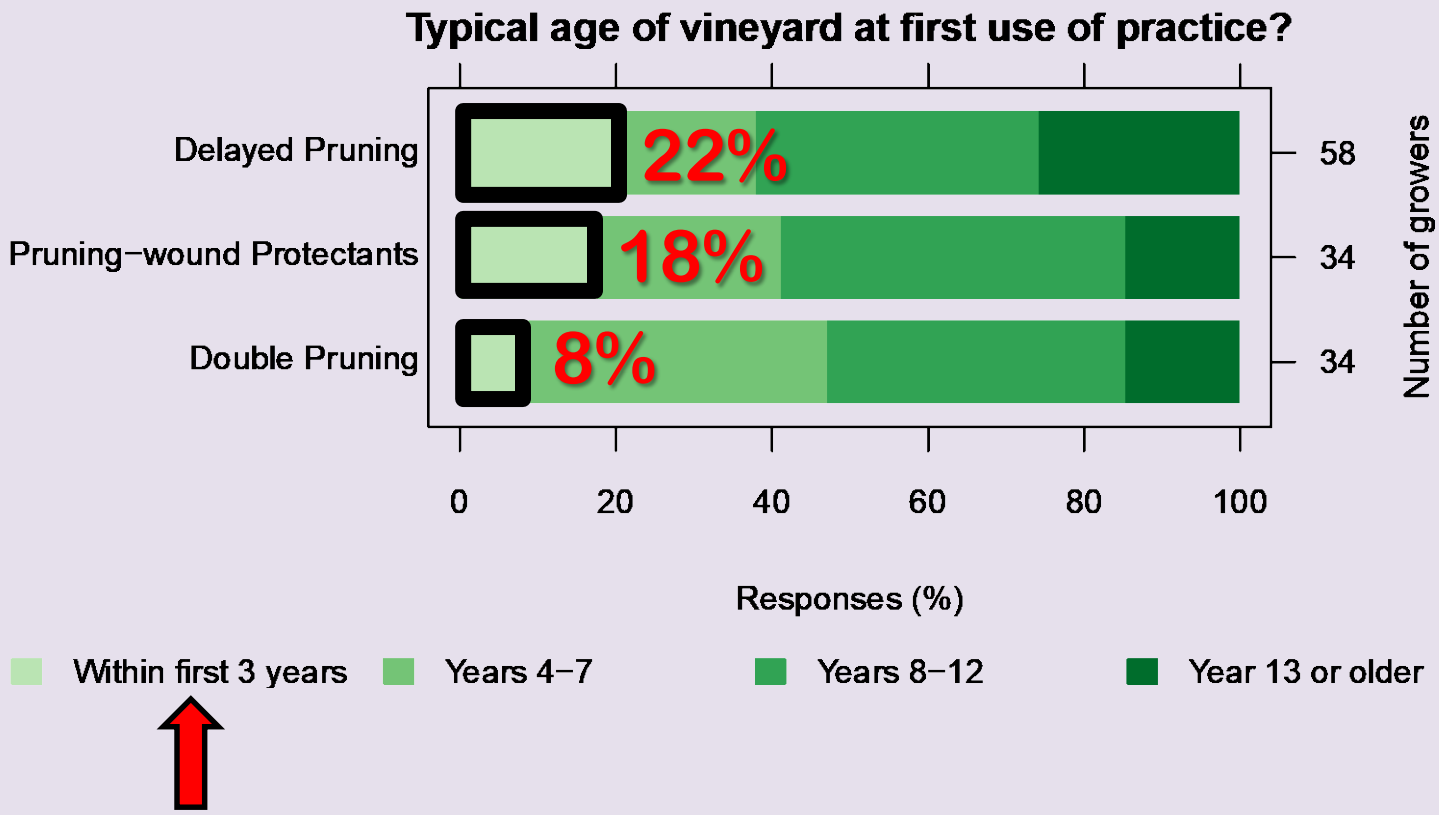
Delayed Pruning	Pruning-wound Protectants	Double Pruning
		
~~December~~ ✗ ~~January~~ ✗ February ✓	Topsin, painted on pruning wounds	1st pass- Dec. (pre-pruning) 2nd pass - Feb.

Practice use



Vineyard age when practice adopted

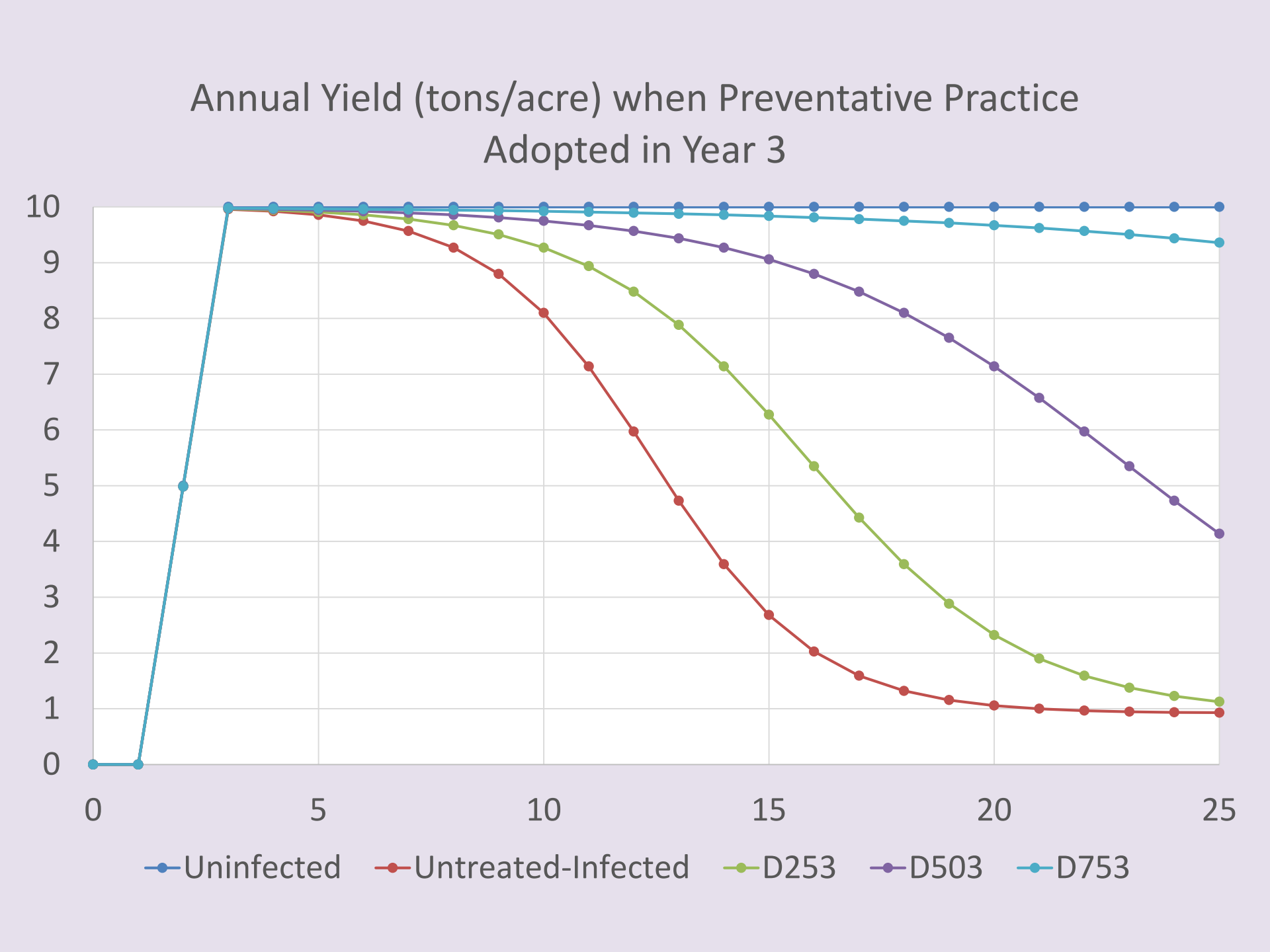


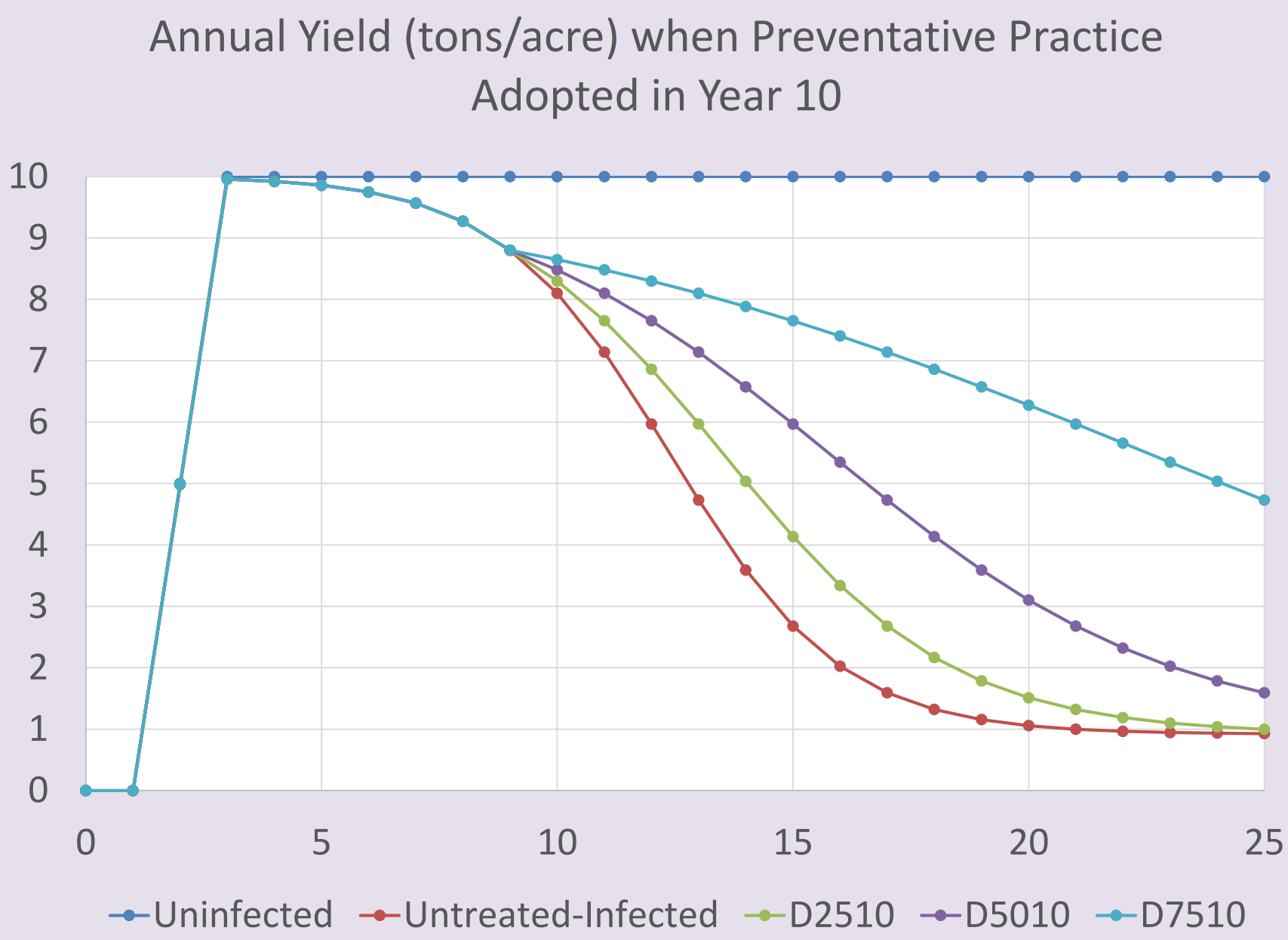

Typical age of vineyard at first use of practice?
Delayed Pruning
Pruning−wound Protectants
Double Pruning
22%
18%
8%
58
34
34
Number of growers
0
20
40
60
80
100
Responses (%)
Within first 3 years
Years 4−7
Years 8−12
Year 13 or older

Evidence of Biological Efficacy

Trunk Disease	Delayed Pruning	Double Pruning	Pruning-wound Protectant
Botryosphaeria	58 – 72%	58 – 72%	60 – 80%
Esca	28 – 87%	28 – 87%	52 – 58 %
Eutypa	75 – 97%	75 – 97%	100%

Sources: Amponsah et al. (2012), Larignon & Dubos (2000), Rolshausen et al. (2010), Urbez-Torres & Gubler (2011), Weber et al. (2007).


Annual Yield (tons/acre) when Preventative Practice Adopted in Year 3
10
9
8
7
6
5
4
3
2
1
0
0
5
10
15
20
25
Uninfected
Untreated-Infected
D253
D503
D753


Annual Yield (tons/acre) when Preventative Practice Adopted in Year 10
10
9
8
7
6
5
4
3
2
1
0
0
5
10
15
20
25
Uninfected
Untreated-Infected
D2510
D5010
D7510

Economic Adoption Model

Optimize by selecting practice and age of adoption which maximize expected net benefits

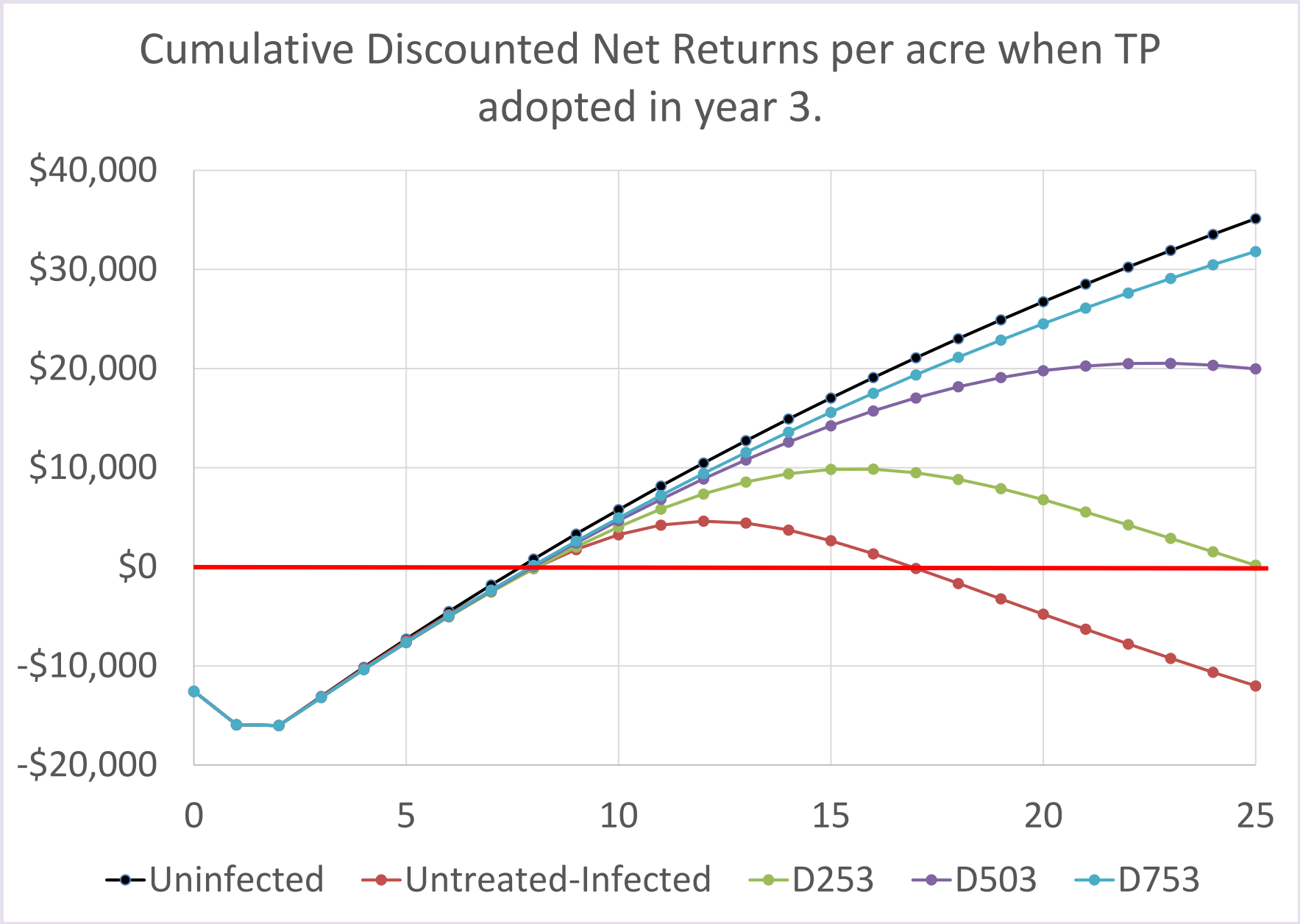
Expected net benefits depend on prices, yield, age when adoption begins, practice costs, dce, discount rate, and perceived probability of infection

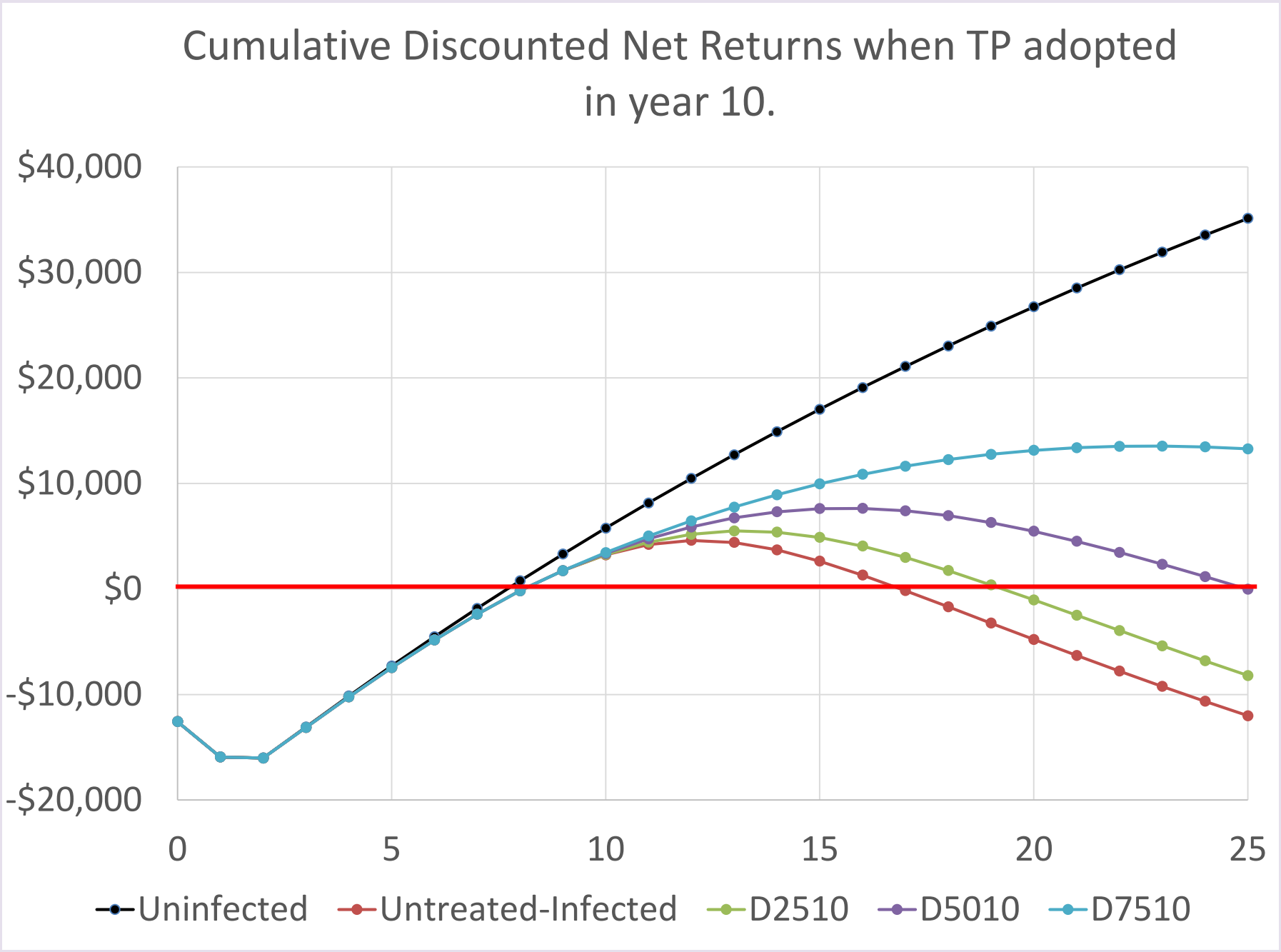
We look at

- cumulative net benefits,
- last profitable year,
- age at which a practice outperforms no-action,
- infection probability threshold

Model parameterized with data from

- UCCE Cost and Return Studies
- USDA-NASS
- Scientific literature
- Semi-structured Interviews


Cumulative Discounted Net Returns per acre when TP adopted in year 3.
$40,000
$30,000
$20,000
$10,000
$0
-$10,000
-$20,000
0
5
10
15
20
25
Uninfected
Untreated-Infected
D253
D503
D753


Cumulative Discounted Net Returns when TP adopted in year 10.
$40,000
$30,000
$20,000
$10,000
$0
-$10,000
-$20,000
0
5
10
15
20
25
Uninfected
Untreated-Infected
D2510
D5010
D7510

Additional cumulative discounted net benefits (NB) from adoption of a preventative practice (in 2013 dollars)

	25% DCE			50% DCE			75% DCE		
	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10
Napa (4)									
Delayed Pruning	**$46,720**	**$37,880**	**$16,159**	**$114,680**	**$96,944**	**$44,205**	**$155,303**	**$147,388**	**$89,863**
Topsin	**$45,614**	**$36,903**	**$15,472**	**$113,574**	**$95,967**	**$43,517**	**$154,197**	**$146,410**	**$89,175**
Double Pruning	**$39,311**	**$31,334**	**$11,557**	**$107,271**	**$90,397**	**$39,603**	**$147,894**	**$140,841**	**$85,261**
Northern San Joaquin (11)									
Delayed Pruning	**$12,993**	$10,534	$4,494	**$31,892**	**$26,960**	**$12,293**	**$43,189**	**$40,988**	**$24,990**
Topsin	$11,621	$9,322	$3,642	**$30,520**	**$25,747**	$11,441	**$41,817**	**$39,776**	**$24,138**
Double Pruning	$8,761	$6,795	$1,866	**$27,660**	**$23,221**	$9,665	**$38,957**	**$37,249**	**$22,362**
Central Coast (8)									
Delayed Pruning	**$18,929**	**$15,349**	**$6,548**	**$46,464**	**$39,281**	**$17,912**	**$62,923**	**$59,721**	**$36,412**
Topsin	**$16,401**	**$13,116**	$4,978	**$43,937**	**$37,048**	**$16,342**	**$60,396**	**$57,487**	**$34,842**
Double Pruning	**$13,143**	**$10,236**	$2,954	**$40,679**	**$34,169**	**$14,318**	**$57,137**	**$54,608**	**$32,818**
Lake (2)									
Delayed Pruning	**$12,993**	**$10,534**	$4,494	**$31,892**	**$26,960**	**$12,293**	**$43,189**	**$40,988**	**$24,990**
Topsin	**$11,621**	**$9,322**	$3,642	**$30,520**	**$25,747**	**$11,441**	**$41,817**	**$39,776**	**$24,138**
Double Pruning	**$8,761**	**$6,795**	$1,866	**$27,660**	**$23,221**	**$9,665**	**$38,957**	**$37,249**	**$22,362**
Sonoma (3)									
Delayed Pruning	$23,539	$19,087	$8,142	**$57,781**	**$48,848**	$22,274	**$78,248**	**$74,265**	**$45,280**
Hand painted Topsin	$22,388	$18,070	$7,427	**$56,630**	**$47,831**	$21,559	**$77,097**	**$73,248**	**$44,565**
Double Pruning	$18,347	$14,499	$4,917	**$52,588**	**$44,260**	$19,049	**$73,056**	**$69,677**	**$42,055**

Last year mature vineyard generates positive annual net returns, by region (crush district number) and practice scenario.

	25% DCE			50% DCE			75% DCE		
	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10
Napa (4)									
Delayed Pruning	18	17	16	25	24	19	25	25	25
Topsin	18	17	15	25	24	19	25	25	25
Double Pruning	18	17	15	25	24	19	25	25	25
Northern San Joaquin (11)									
Delayed Pruning	15	15	13	22	20	15	25	25	22
Topsin	15	15	13	22	20	15	25	25	22
Double Pruning	15	14	13	22	20	15	25	25	21
Central Coast (8)									
Delayed Pruning	16	15	14	23	21	16	25	25	24
Topsin	16	15	13	23	21	16	25	25	23
Double Pruning	16	15	13	23	21	16	25	25	23
Lake (2)									
Delayed Pruning	17	16	14	24	22	17	25	25	25
Topsin	17	16	14	24	22	17	25	25	25
Double Pruning	16	16	14	24	22	17	25	25	25
Sonoma (3)									
Delayed Pruning	16	15	13	22	21	16	25	25	23
Topsin	15	15	13	22	20	15	25	25	22
Double Pruning	15	15	13	22	20	15	25	25	22

Age when cumulative discounted net benefits of adopting a preventative practice exceeds that of an infected-untreated vineyard, by region (crush district number) and practice scenario.

	25% DCE			50% DCE			75% DCE		
	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10
Napa (District 4)									
Topsin	6	6	10	5	5	10	4	5	10
Double Pruning	10	9	11	9	8	10	8	8	10
Northern San Joaquin (11)									
Topsin	9	9	10	8	8	10	7	7	10
Double Pruning	11	11	12	10	10	11	10	10	10
Central Coast (District 8)									
Topsin	9	9	10	8	8	10	8	8	10
Double Pruning	11	11	12	10	10	11	10	9	10
Lake (District 2)									
Topsin	7	7	10	6	6	10	6	6	10
Double Pruning	10	10	11	10	9	10	9	9	10
Sonoma (District 3)									
Topsin	7	7	10	6	6	10	6	6	10
Double Pruning	10	10	11	9	9	10	9	9	10

Infection Probability Threshold (π) that divides population of growers between non-adopters and adopters for different regions (crush district number) and practice scenarios.

	25% DCE			50% DCE			75% DCE		
	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10	Year 3	Year 5	Year 10
Napa (4)									
Topsin	0.024	0.026	0.043	0.010	0.010	0.016	0.007	0.007	0.008
Double Pruning	0.159	0.173	0.285	0.065	0.068	0.104	0.048	0.044	0.051
Northern San Joaquin (11)									
Topsin	0.106	0.115	0.190	0.043	0.045	0.069	0.032	0.030	0.034
Double Pruning	0.326	0.355	0.585	0.133	0.139	0.214	0.098	0.091	0.105
Central Coast (8)									
Topsin	0.134	0.146	0.240	0.054	0.057	0.088	0.040	0.037	0.043
Double Pruning	0.306	0.333	0.549	0.125	0.130	0.201	0.092	0.086	0.099
Lake (2)									
Topsin	0.047	0.051	0.084	0.019	0.020	0.031	0.014	0.013	0.015
Double Pruning	0.234	0.255	0.421	0.095	0.100	0.154	0.071	0.066	0.076
Sonoma (3)									
Topsin	0.049	0.053	0.088	0.020	0.021	0.032	0.015	0.014	0.016
Double Pruning	0.221	0.240	0.396	0.090	0.094	0.145	0.066	0.062	0.071

- **Adoption of preventative practices increases net returns to growers**
- **Adoption of preventative practices increases profitable lifespan**
- **The time it takes for a practice adopted in young vineyards to outperform no action is long given slow growth of disease**
- **Infection probability threshold is generally low**
- **Need to provide information on economic benefits of early adoption**

Project websites

treeandvinetrunkdiseases.org

sustainablewinegrowing.org

treeandvinetrunkdiseases.org/economic-tool

SCRI Trunk Disease Project Page | Where we save trunks! - Google Chrome

file:///C:/Users/kaplanj/Desktop/Projects/wood%20canker/websiteshow-org/SCRI%20Trunk%20Disease%20Project%20Page

Apps | SacState | Econ | Yahoo | SacCT | Google | Google Scholar | USDA-NASS | SacSend | Scan | OGS Home | Other bookmarks

SCRI TRUNK DISEASE PROJECT PAGE

WHERE WE SAVE TRUNKS!

SEARCH

HOME | RESEARCH | EXTENSION | NEWS & ACTIVITIES | ABOUT US | LINKS

enter keywords Search

CALIFORNIA SUSTAINABLE WINEGROWING ALLIANCE

- Home
- Sustainable Winegrowing Program
- Certified Sustainable Winegrowing
- Performance Metrics
- Workshop Calendar
- Resources
- Newsletters
- Press Room
- About CSWA
- Contact Us
- Payments
- Español

ACCESS THE SWP ONLINE SYSTEM
LOGIN

California Sustainable Winegrowing Program

Benefiting the environment, the community and high quality grapes and wine.

"*Sustainability* by itself is just a word. What gives it meaning are the programs and people behind it that drive change, improve the environment and produce the best quality grapes and wines in the world. The CSWA program accomplishes all of this and more…I am proud to be associated with the CSWA program and thrilled with what it has and will accomplish in the coming years."

-Chris Savage

CERTIFIED CALIFORNIA SUSTAINABLE WINEGROWING

Find Certified Participants

Certified California Sustainable Winegrowing (CERTIFIED SUSTAINABLE) is a certification program that provides verification by a third-party auditor that a winery or vineyard implements sustainable practices and continuous improvement. To learn more, click here.

CSWA Releases New Cost Benefit Tools

The California Sustainable Winegrowing Alliance (CSWA) recently released new economic tools to help growers and vintners assess costs and benefits of adopting specific sustainable winegrowing practices. Growers can use the Excel based calculators to support decisions on different types of sprayers, compare dust mitigation methods and develop a sustainable water management strategy. They can also use a web-based tool to evaluate costs and potential savings from implementing different trunk disease prevention practices. Vintners can use the tools to evaluate winery water efficiency and identify hot spots, estimate the true cost of water, and conduct a solid waste audit. In addition, a certification cost

enter keywords Search

Resources

CALIFORNIA SUSTAINABLE WINEGROWING ALLIANCE

Resources

CSWA strives to provide the most pertinent and helpful information to California winegrape growers and vintners. A key part of CSWA's mission is to provide educational materials and resources that will enhance sustainable practices throughout the state. This section of our website aims to deliver important resources in a user friendly manner.

The CSWA Publications page includes educational guides and handouts for growers and vintners covering topics such as winery water management, biodiversity, and greenhouse gas emissions.

The Sustainability Reports page includes statewide reports from as far back as 2004 to benchmark the adoption of sustainable practices in California.

The Economic Tools page includes tools that allow growers and vintners to assess the costs and benefits of adopting specific sustainable practices.

The Newsletters page includes recent and past editions of the montly Down to Earth Newsletter, profiling vineyards and wineries and highlighting industry best practices.

The Educational Videos page hosts a series of short videos highlighting best practices throughout the industry. Many of the videos available have been produced in partnership with PG&E and focus on energy conservation.

The Grower & Vintner Resources page links to web resources with the most relevant resources for each section listed under "Key Resources & Tools."

The Case Studies page provides practical examples of sustainable practices being implemented across the state.

enter keywords Search

Economic Tools

CALIFORNIA SUSTAINABLE WINEGROWING ALLIANCE

Economic Tools to Assess Costs & Benefits of Sustainable Winegrowing Practices

The following economic tools can be downloaded and used by growers and vintners to assess the costs and benefits of adopting specific practices. Each tool includes an Introduction page, How to Use the tool page, the tool itself, and a Summary page that can be easily printed and used for internal discussions and for tracking over time. The Trunk Disease Tool is a web-based tool, which also allows you to print and compare results. All other tools are Excel-based, and you can simply click on the links and download to save the Tools for your own use.

The tools were developed as part of a California Department of Food and Agriculture Specialty Crop Block Grant project to help demonstrate the business case for adoption of sustainable practices and guide decisions about which practices to implement. The project was led by an Advisory Group* of agricultural economists and other experts and included substantial feedback from growers and vintners on the Sustainable Winegrowing Joint Committee.

Vineyard Economic Tools

- **Trunk Disease Management Tool**: Grapevine trunk diseases eventually infect every vineyard in California and can significantly reduce yields in mature vineyards, often leading to premature replanting. If adopted in young vineyards, preventative practices can reduce these negative effects. This web-based tool is designed to help growers assess the costs and economic benefits of implementing various preventative practices at different ages of vineyard maturity.
- **Sprayer Decision Tool - Air Blast vs. Electrostatic Sprayers:** This tool assists growers in comparing the financial cost of air blast dilute sprayers (fan assisted) and electrostatic sprayers. While electrostatic sprayers can cost up to twice the price of air blast sprayers, they may allow vineyard managers to reduce the material applied in the vineyard up to 25% without decreasing efficacy in addition to documented water savings. Once completed, the tool provides a summary of the present value for the two sprayer types allowing growers to determine potential payback periods for each sprayer.
- **Dust Mitigation Methods Comparison Tool:** This tool has been designed to aid in creating and implementing an effective and cost efficient dust control strategy to protect air quality. The tool provides helpful information on different dust control techniques, types of palliatives commonly used, a simple worksheet for tracking your dust control strategies over time, and a cost comparison calculator that will help inform you of the most cost effective method for you to maintain unpaved roads.
- **Vineyard Sustainable Water Management Tool**: This tool is designed to help growers create an effective sustainable water management strategy that helps save both water and money, as detailed in Chapter 5 of the California Code of Sustainable Winegrowing Workbook. An efficient sustainable water management strategy contains many complex decisions and is highly variable across regions, varieties, and grape growing goals. This tool can be used to establish a

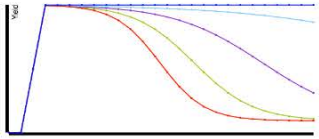
ECONOMIC TOOL

Trunk disease management tool




Grapevine trunk diseases (aka wood-canker diseases) are widespread throughout all of California's grape-growing regions. This disease complex includes: Botryosphaeria dieback (aka Bot canker), Eutypa dieback, Phomopsis dieback, and Esca (aka Measles, Young vine decline, Petri disease).

Every California vineyard is eventually infected by one predominant trunk disease or a combination. These diseases significantly reduce yields in mature vineyards by either killing fruiting positions (main impact of the dieback-type diseases) or decreasing vine vigor (main impact of Esca). These impacts accumulate each year, as there are no effective methods to eradicate the wood infections. As such, diseased vineyards must be replanted prematurely. If adopted in young vineyards, preventative practices can reduce these negative effects.

SCRI TRUNK DISEASE PROJECT PAGE

WHERE WE SAVE TRUNKS!

SEARCH

HOME | RESEARCH | EXTENSION | NEWS & ACTIVITIES | ABOUT US | LINKS

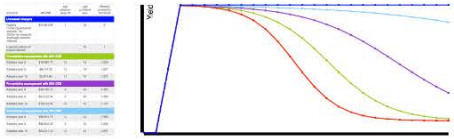
- ECONOMIC TOOL
- IDENTIFYING SOCIOLOGICAL HURDLES TO ADOPTION PRACTICES
- TRUNK DISEASE DIAGNOSTICS APP
- TRUNK DISEASE MANAGEMENT IN CALIFORNIA
- TRUNK DISEASE PAMPHLET

ECONOMIC TO

Trunk dise
management tool

Grapevine trunk diseases (aka wood-canker diseases) are widespread throughout all of California's grape-growing regions. This disease complex includes: Botryosphaeria dieback (aka Bot canker), Eutypa dieback, Phomopsis dieback, and Esca (aka Measles, Young vine decline, Petri disease).

Every California vineyard is eventually infected by one predominant trunk disease or a combination. These diseases significantly reduce yields in mature vineyards by either killing fruiting positions (main impact of the dieback-type diseases) or decreasing vine vigor (main impact of Esca). These impacts accumulate each year, as there are no effective methods to eradicate the wood infections. As such, diseased vineyards must be replanted prematurely. If adopted in young vineyards, preventative practices can reduce these negative effects.



ECONOMIC TOOL

Describe your growing scenario

Vineyard basics

Select the region where your vineyard is located or one that is similar to your growing conditions:

Northern San Joaquin ▾
- Northern San Joaquin
- Napa
- Lake
- Sonoma
- Central Coast

C…et all parameters to the default values for this region.

Indica…tage when adoption of preventative practice begins:

Select at least one year.

These years were selected following grower interviews and discussions with viticulture farm advisors to reflect key stages in a vineyard's lifespan.

- [x] Year 3: Vines fully trained onto the trellis system, winter pruning begins.
- [x] Year 5: Vines reach maturity.
- [x] Year 10: Trunk disease symptoms typically appear.

ECONOMIC TOOL

Select figures to display

- (•) Yield (in tons per acre) over the vineyard's 25-year lifespan, at various disease control efficacy rates.
- ( ) Cumulative discounted net returns (in thousands of dollars per acre) across each year of the vineyard's 25-year lifespan, at various disease control efficacy rates.

Variable definitions

Disease control efficacy rate information

Customize scenario paramaters

HOME | RESEARCH | EXTENSION | NEWS & ACTIVITIES | ABOUT US | LINKS

ECONOMIC TOOL

Customize scenario paramaters

The scenario parameters are currently set to **Northern San Joaquin** default values. From here you can:

Run this scenario now with the current settings

or

Customize the scenario:
Set prices and yields specific to your vineyard

Baseline settings

Values left blank in this table will be handled as follows:

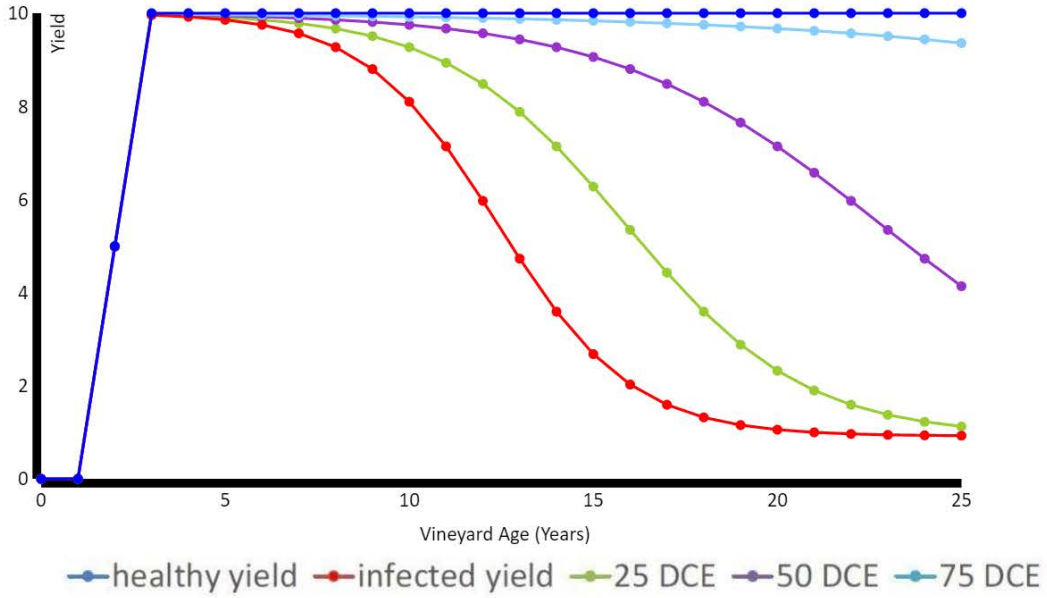
For missing values, perform calculations with Northern San Joaquin ▾ *default values.*

Reset all values to this region's defaults

Change to another regions to see the default settings from the economic analysis in the table below or enter your own numbers below and hit submit to generate figure and table results.

ECONOMIC TOOL

Figure 1—Vineyard Yield (Tons per Acre) at Various Disease Control Efficacy Rates
Year 3 Preventative Practice Adoption, Northern San Joaquin Region



SCRI TRUNK DISEASE PROJECT PAGE

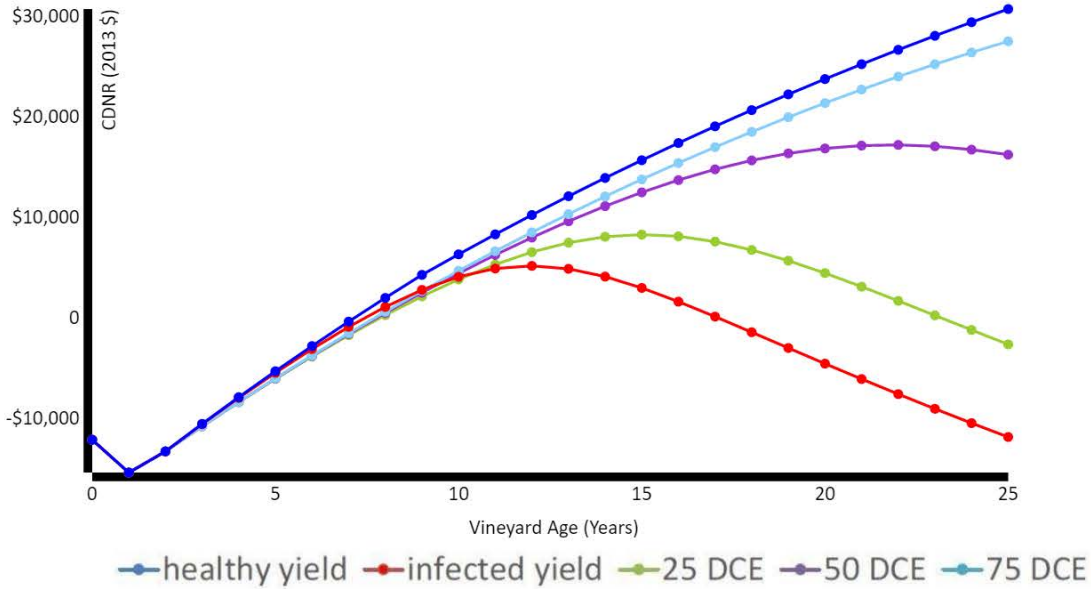
WHERE WE SAVE TRUNKS!

SEARCH

HOME | RESEARCH | EXTENSION | NEWS & ACTIVITIES | ABOUT US | LINKS

ECONOMIC TOOL

Figure 1—Cumulative Discounted Net Returns per Acre at Various Disease Control Efficacy Rates
Year 3 Adoption of $243 per Acre-Year Preventative Practice, Northern San Joaquin Region



View fullscreen

ECONOMIC TOOL

Scenario	ACDNB	Age adoption pays off	Last profitable year	Infection probability threshold
Untreated vineyard				
Healthy *Hypothetical scenario, as all California vineyards are highly susceptible to infection.*	$44,991.96	-	25	0
Expected effects of typical infection	-	-	12	1
Preventative management with 25% DCE				
Adopted year 3	$9,230.79	11	15	0.290
Adopted year 5	$7,209.92	11	14	0.316
Adopted year 10	$2,156.01	12	13	0.520
Preventative management with 50% DCE				
Adopted year 3	$28,136.77	10	22	0.118
Adopted year 5	$23,641.03	10	20	0.123
Adopted year 10	$9,958.02	10	15	0.190

ECONOMIC TOOL

Preventative management with 25% DCE				
Adopted year 3	$9,230.79	11	15	0.290
Adopted year 5	$7,209.92	11	14	0.316
Adopted year 10	$2,156.01	12	13	0.520
Preventative management with 50% DCE				
Adopted year 3	$28,136.77	10	22	0.118
Adopted year 5	$23,641.03	10	20	0.123
Adopted year 10	$9,958.02	10	15	0.190
Preventative management with 75% DCE				
Adopted year 3	$39,437.80	10	25	0.087
Adopted year 5	$37,674.06	9	25	0.081
Adopted year 10	$22,659.76	10	21	0.094

ECONOMIC TOOL

Parameter Values Used in Calculations

All parameters are set to Northern San Joaquin regional default values in the present set of calculations.

Price per ton	$650
Discount rate	3%
Additional annual cost per acre of preventative practice	$243
Annual cultural cost per acre	
Year 0: Establishing vineyard	$12,213
Year 1: Establishing vineyard	$3,370
Year 2: Establishing vineyard	$1,004
Year 3+: Established vineyard	$3,505
Annual yield per acre in tons	
Year 0	0
Year 1	0

ECONOMIC TOOL

Year 2: Establishing vineyard	$1,004
Year 3+: Established vineyard	$3,505
Annual yield per acre in tons	
Year 0	0
Year 1	0
Year 2	5
Year 3	10
Year 4	10
Year 5+	10

Print these results. | Variable definitions

Return to input form to modify this scenario. | Design a new scenario in a new tab to preserve this output.

↑ Top

Customize scenario paramaters

The scenario parameters are currently set to **Northern San Joaquin** default values. From here you can:

Run this scenario now with the current settings

or

Customize the scenario:
Set prices and yields specific to your vineyard

Baseline settings

Values left blank in this table will be handled as follows:

For missing values, perform calculations with Northern San Joaquin ▾ *default values.*

Reset all values to this region's defaults

Change to another regions to see the default settings from the economic analysis in the table below or enter your own numbers below and hit submit to generate figure and table results.

Price per ton ($)	650
Discount rate (%)	3

Discount rate definition

Additional annual cost per acre of preventative practice ($)	175

Using default annual cost per acre for Double pruning ▾

Preventative practice definitions and cost information

Disease control efficacy rate information

Using default annual cost per acre for Double pruning ▾

Preventative practice definitions and cost information

Disease control efficacy rate information

Annual cultural costs per acre ($)	
Year 0: Establishing Vineyard	12213
Year 1: Establishing Vineyard	3370
Year 2: Establishing Vineyard	1004
Year 3+: Established Vineyard	3505

Annual yield per acre (in tons)	
Year 0	0
Year 1	0
Year 2	5
Year 3	10
Year 4	10
Year 5+	10

Display returns to this scenario

↑ Top

Using default annual cost per acre for Double pruning ▾

Preventative practice definitions and cost information

Disease control efficacy rate information

Annual cultural costs per acre ($)	
Year 0: Establishing Vineyard	12213
Year 1: Establishing Vineyard	3370
Year 2: Establishing Vineyard	1004
Year 3+: Established Vineyard	3505

Annual yield per acre (in tons)	
Year 0	0
Year 1	0
Year 2	7
Year 3	12
Year 4	12
Year 5+	12

Display returns to this scenario

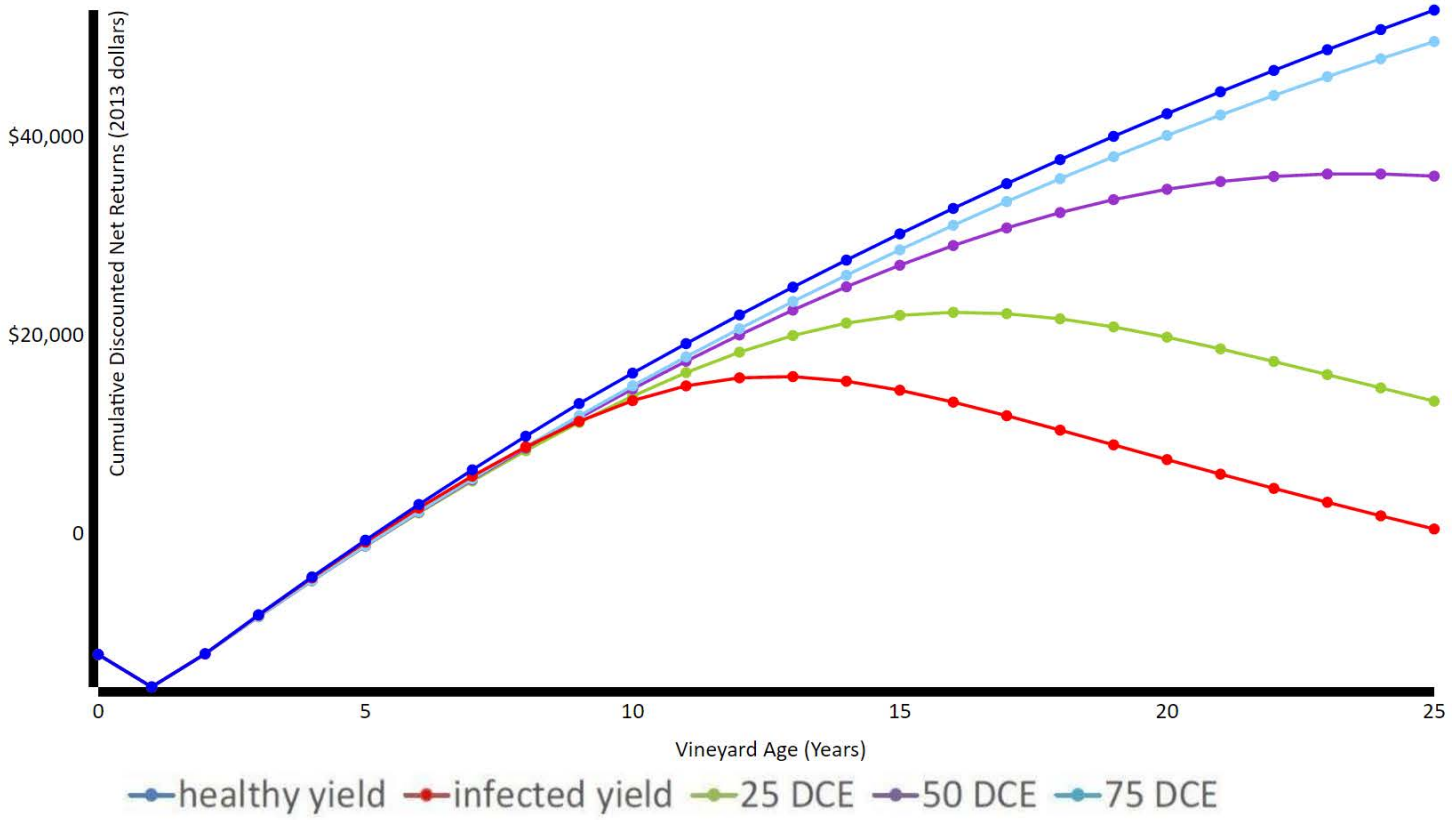
↑ Top

Trunk disease management tool




Results

Figure 1—Cumulative Discounted Net Returns per Acre at Various Disease Control Efficacy Rates
Year 3 Adoption of $175 per Acre-Year Preventative Practice



View fullscreen

Output table

Scenario	ACDNB	Age adoption pays off	Last profitable year	Infection probability threshold
Untreated vineyard				
Healthy *Hypothetical scenario, as all California vineyards are highly susceptible to infection.*	$53,992.19	-	25	0
Expected effects of typical infection	-	-	13	1
Preventative management with 25% DCE				
Adopted year 3	$12,884.21	10	16	0.174
Adopted year 5	$10,248.86	10	16	0.190
Adopted year 10	$3,709.72	11	14	0.312
Preventative management with 50% DCE				
Adopted year 3	$35,571.39	9	24	0.071
Adopted year 5	$29,966.20	9	22	0.074
Adopted year 10	$13,072.14	10	17	0.114
Preventative management with 75% DCE				
Adopted year 3	$49,132.63	8	25	0.052
Adopted year 5	$46,805.83	8	25	0.049
Adopted year 10	$28,314.22	10	25	0.056

Parameter Values Used in Calculations

These values describe a custom scenario designed by the user of this tool.

Price per ton	$650
Discount rate	3%
Additional annual cost per acre of preventative practice	$175
Annual cultural cost per acre	
Year 0: Establishing vineyard	$12,213
Year 1: Establishing vineyard	$3,370
Year 2: Establishing vineyard	$1,004
Year 3+: Established vineyard	$3,505
Annual yield per acre in tons	
Year 0	0
Year 1	0
Year 2	7
Year 3	12
Year 4	12
Year 5+	12

Print these results. | Variable definitions

Return to input form to modify this scenario. | Design a new scenario in a new tab to preserve this output.

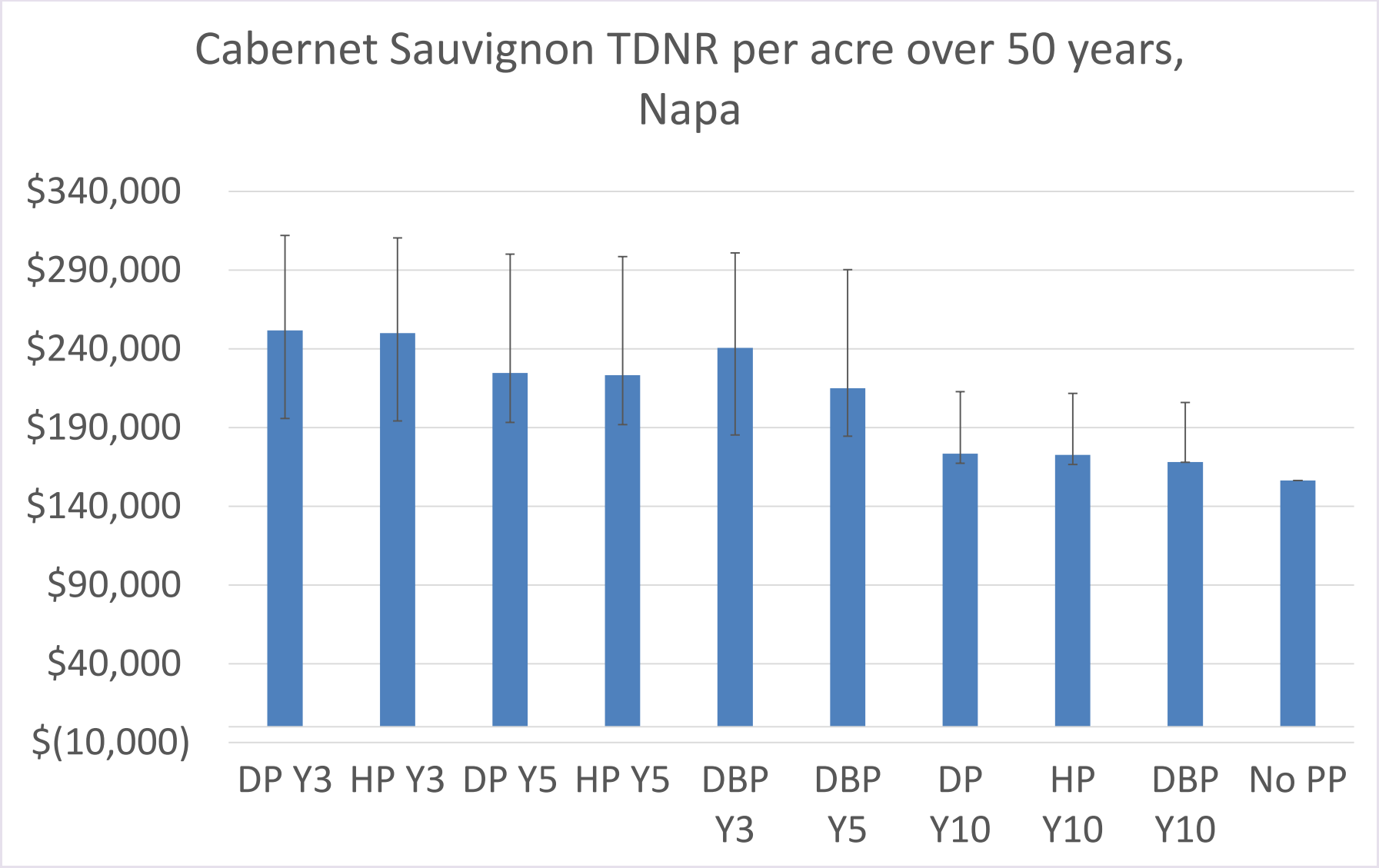
Vine Surgery

Substitute or Complement

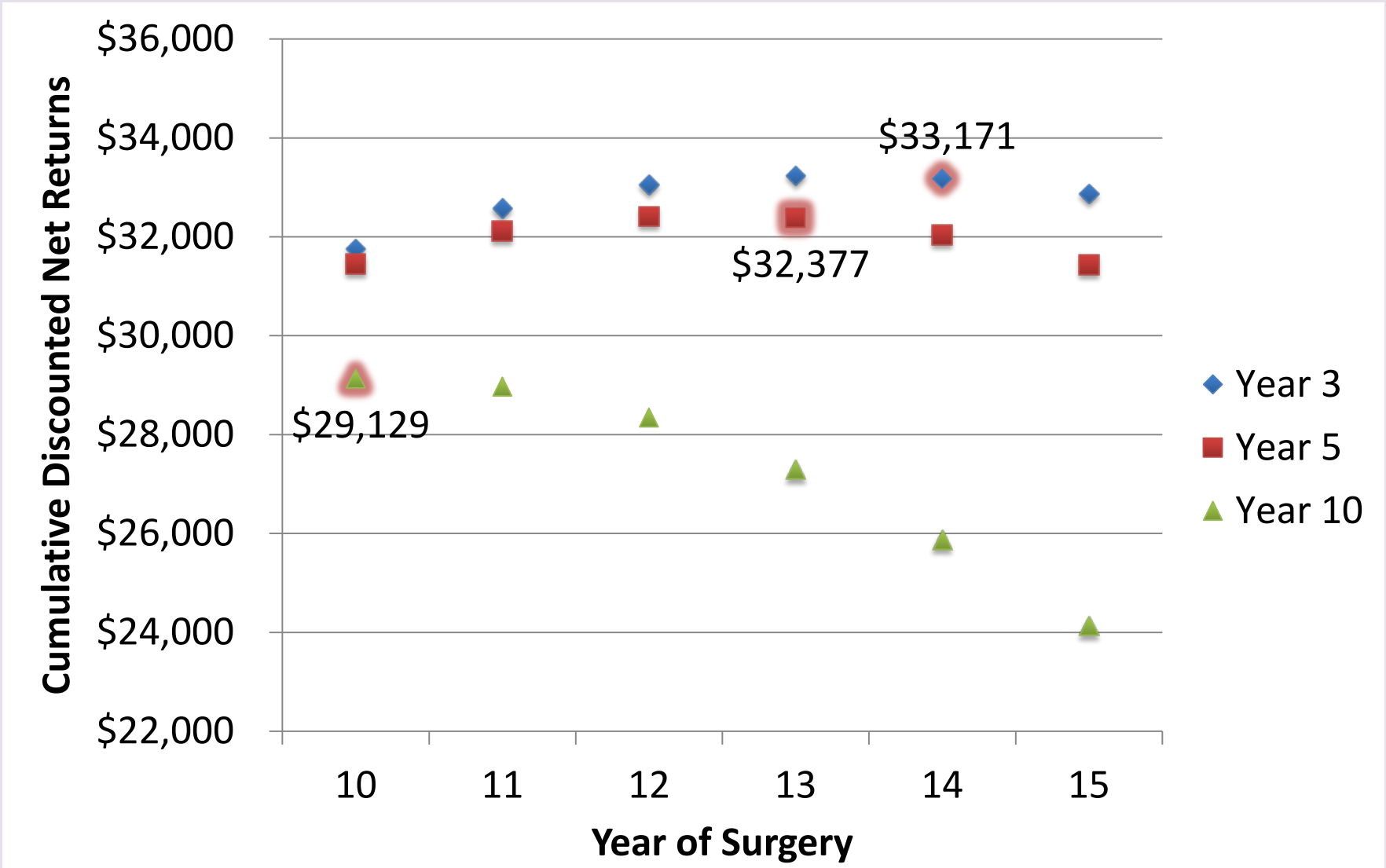
Can vine surgery take the place of preventative practices?

Can vine surgery further benefit growers who adopt preventative practices?

Extreme Vine Surgery: Remove and Replant



Cumulative Discounted Net Returns per acre for a NSJ vineyard for select vine surgery years and years of adoption of preventative practice, assuming 50% DCE.



Cumulative Discounted Net Returns per acre for Vine Surgery in Select Years relative to No Action for Napa with 50% DCE over 25 years

Age	Practice	PP Only	10	11	12	13	14	15
3	DP	121,875	156,241	159,568	161,686	162,746	**162,890**	162,226
3	TP	120,744	155,113	158,440	160,560	161,621	**161,766**	161,104
3	DBP	114,249	148,637	151,969	154,095	155,164	**155,319**	154,669
5	DP	103,026	154,720	157,559	159,077	**159,405**	158,665	156,950
5	TP	102,027	153,726	156,566	158,086	**158,416**	157,678	155,967
5	DBP	96,288	148,018	150,867	152,397	**152,739**	152,017	150,324
10	DP	46,978	146,537	**146,566**	144,872	141,599	136,908	130,966
10	TP	46,275	145,854	**145,887**	144,198	140,930	136,246	130,311
10	DBP	42,241	141,932	**141,990**	140,330	137,095	132,446	126,549
	No PP	-	122,513	**126,127**	126,021	121,944	114,333	104,188