Economics of commercial grape production

Tony K. Wolf, Professor of Viticulture

Bill Boyd, Surry Community College

Virginia Tech
1872

Assumptions used in cash financial analysis

- Land is owned; purchase price not included in budgets
- Models based on 10-acre + *Vitis vinifera* vineyard
- Excellent site; one crop reduction/10-year period
- Labor at $8.00 (unskilled) or $17.50 (skilled)

Assumptions used in financial analysis

- Operating expenses borrowed at 9% interest for ½ of year expenses are taken
- Machinery purchased at nominal interest rate of 8% (5% real rate)
- Excellent vineyard management, including consultant
- Irrigation and deer fence costs are included (amortized over 15 years)

Assumptions used in financial analysis

- Grapes valued at $1,300 or $1,400/ton

VIRGINIA	2002	2003	2004
Cab. Franc	$1,461	$1,435	$1,406
Cab. Sauvignon	$1,484	$1,458	$1,420
Chambourcin	$767	$875	$906
Chardonnay	$1,366	$1,326	$1,361
Viognier	$1,683	$1,509	$1,644

N = 38 – 42 wineries

Assumptions used in financial analysis

- Yields at 4.0 to 6.0 tons/acre, depending upon training
- Data from training system comparison at Winchester VA
- All vines at 10-foot rows x 8-foot vine spacing

CABERNET FRANC	Tons/acre			
	2000	2001	2002	2003
Geneva Double Curtain	4.1	7.1	9.2	7.4
Smart-Dyson	3.3	6.5	7.9	8.1
Vert. Shoot Positioned	3.0	3.8	5.4	5.4

VSP

SD

GDC

Model values used in current financial analysis

Vineyard acreage	10
Training system (*variable*)	Smart-Dyson
Row / vine spacing (feet)	10 x 7
Variety	Chardonnay
Tons/acre at full crop	6.0
Value of crop ($/ton)	$1,300
Skilled labor ($/hr)	$17.50
“Unskilled” labor	$8.00
Picking labor ($/lug)	$1.25

							Unit cost	Units / acre	Hours / Acre	Cost / acre
Trellising Materials										**$ 1,881.94**
3" X 8' CCA-treated Line posts							$5.00	150	0.00	$ 750.00
6" X 9' CCA-treated end posts							$20.00	20	0.00	$ 400.00
12.5 ga.HT cordon and foliage wire (4000ft)							$0.02	8960	0.00	$ 134.40
							$0.02	17920	0.00	$ 268.80
10.5 ga. anchor support wire (4000ft)							$0.02	400	0.00	$ 6.00
End post anchors							$5.95	20	0.00	$ 119.00
In-line ratchet wire strainers for cordon wires							$1.58	10	0.00	$ 15.80
Wirevise wire strainers for foliage wires							$1.43	60	0.00	$ 85.80
Fencing staples for cordon and foliage wires (VA)							$1.90	25	0.00	$ 47.50
Wire Crimping sleeve							$0.10	60	0.00	$ 6.00
Bamboo stakes for trunk support							$0.08	640		$ 48.64
Trellising Construction Labor										**$ 676.15**
Distribute and drive posts (skilled)						6	$17.50	150	15.00	$ 262.50
Distribute and drive posts (unskilled)						6	$8.00	150	15.00	$ 120.00
Auger and set end post (skilled)						8	$17.50	20	2.67	$ 46.67
Auger and set end post (unskilled)						8	$8.00	20	2.67	$ 21.33
Mark line post for cordon and foliage wires (unskilled)						0.72	$8.00	150	1.80	$ 14.40
Mark end post for wire strainers and wirevises (unskilled)						0.72	$8.00	20	0.24	$ 1.92
Drill end post for wirevises (unskilled)						6	$8.00	20	2.00	$ 16.00
Install line post staples for cordon & foliage wire (unskilled)						60	$8.00	4	4.00	$ 32.00
Install end post anchor structure (skilled)						24	$17.50	20	8.00	$ 140.00
String and tighten foliage wire (unskilled)						115	$8.00	0	0.00	$ -
Install bamboo stakes (unskilled)						0.25	8	640	2.67	$ 21.33

Portion of spreadsheet budget to illustrate costs and generation of cash flow information. Smart-Dyson training

VARIABLE COSTS	Year 0	Year 1	Year 2	Year 3	Yrs 4-25
Equipment use	27	465	172	221	235
Weed control	107	195	107	107	107
Fertilization	41	65	65	89	89
Dormant pruning		43	121	514	462
Canopy mgt.		88	625	600	600
Disease/insect mgt.		28	147	631	631
Harvest costs			165	659	659
Sum variable costs	**$176**	**$884**	**$1,403**	**$2,821**	**$2,783**

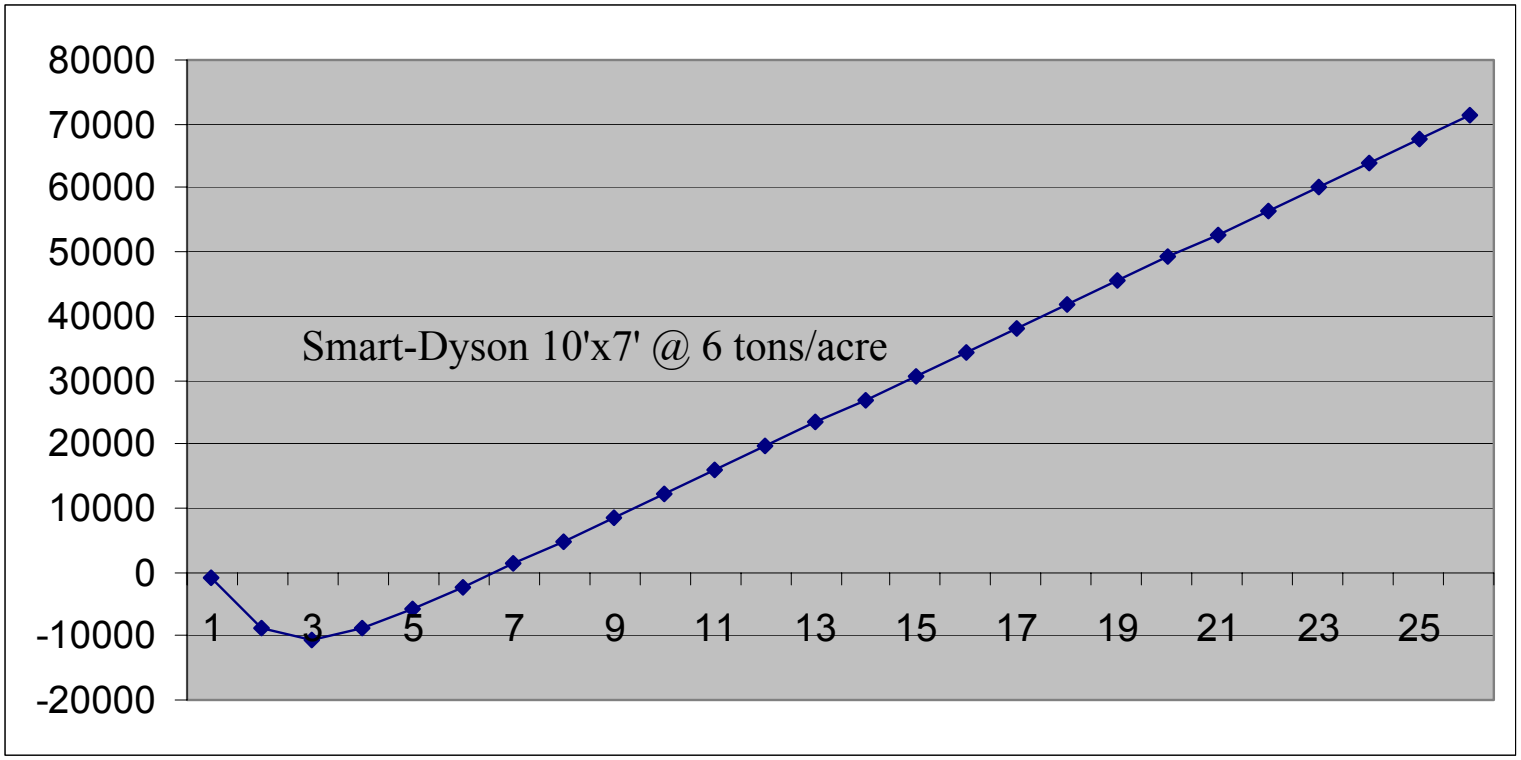
Portion of spreadsheet budget to illustrate costs and generation of cash flow information. Smart-Dyson training

FIXED COSTS	Year 0	Year 1	Year 2	Year 3	Yrs 4-25
Site preparation	151	42			
Vineyard lay-out		141			
Planting		3,291			
Trellis (mat. & labor)		2,289	330		
Hand tools	618				
Machinery (amort.)		788	788	788	788
Irrigation (amort.)		119	119	119	119
Deer fence (amort.)	37	37	37	37	37
Safety equipment		191	162	162	162
Lugs			120	1,080	
Other	830	50	50	50	50
Amortized est. costs					881
Sum fixed costs	**$856**	**$7,727**	**$1,648**	**$2,277**	**$2,078**

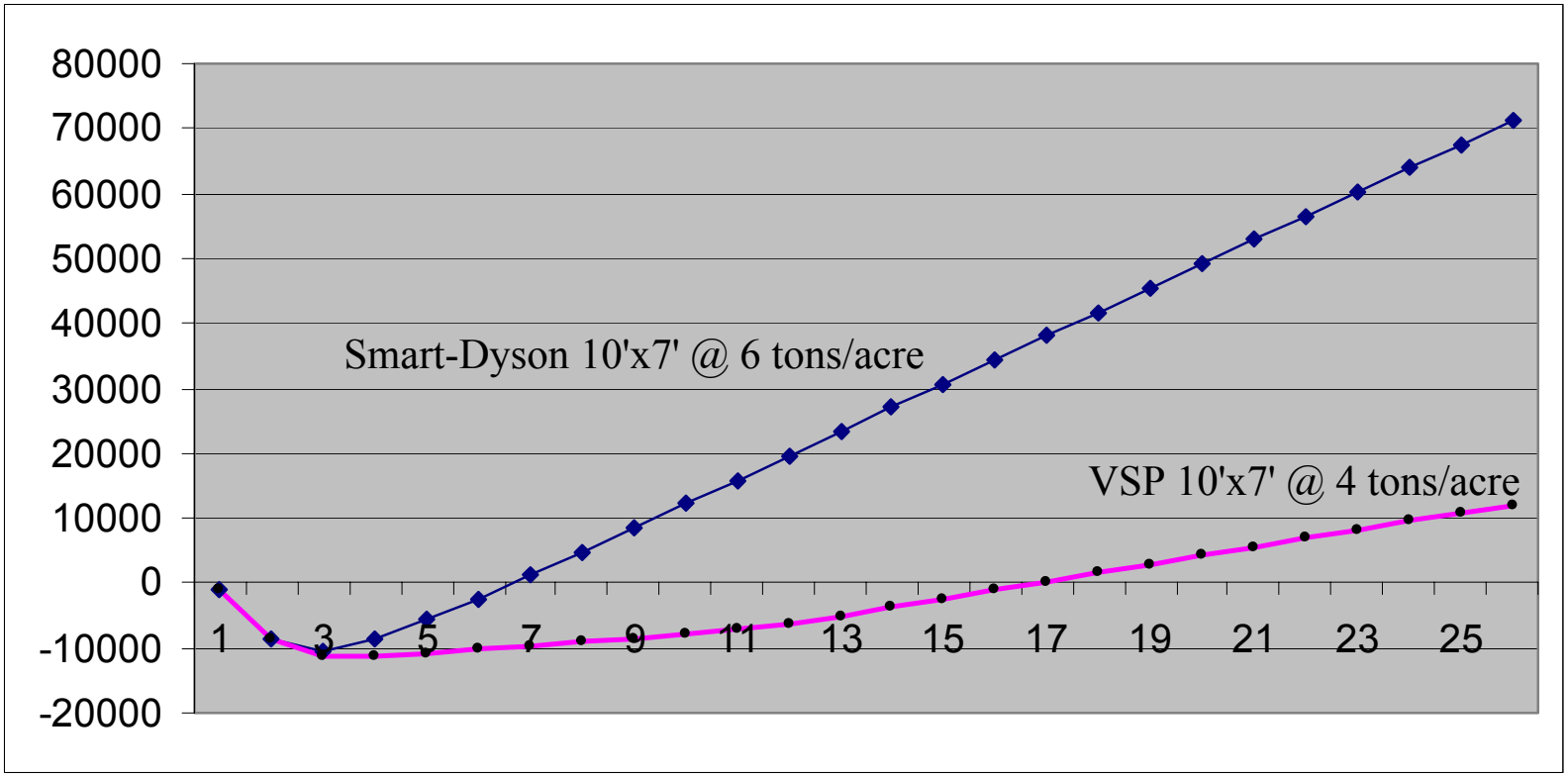
Portion of spreadsheet budget to illustrate costs and generation of cash flow information. Smart-Dyson training

	Year 0	Year 1	Year 2	Year 3	Yrs 4-25
Total expenses	1,031	8,611	2,951	5,099	4,862
Interest	39	403	867	1,175	182
Total expenses + interest	1,070	9,014	3,818	6,274	5,044
Harvest income			780	7,800	7,800
Annual cash flow	(1,070)	(9,014)	(3,038)	1,526	2,756
Cumulative cash flow	(1,070)	(10,084)	(13,122)	(11,596)	☺

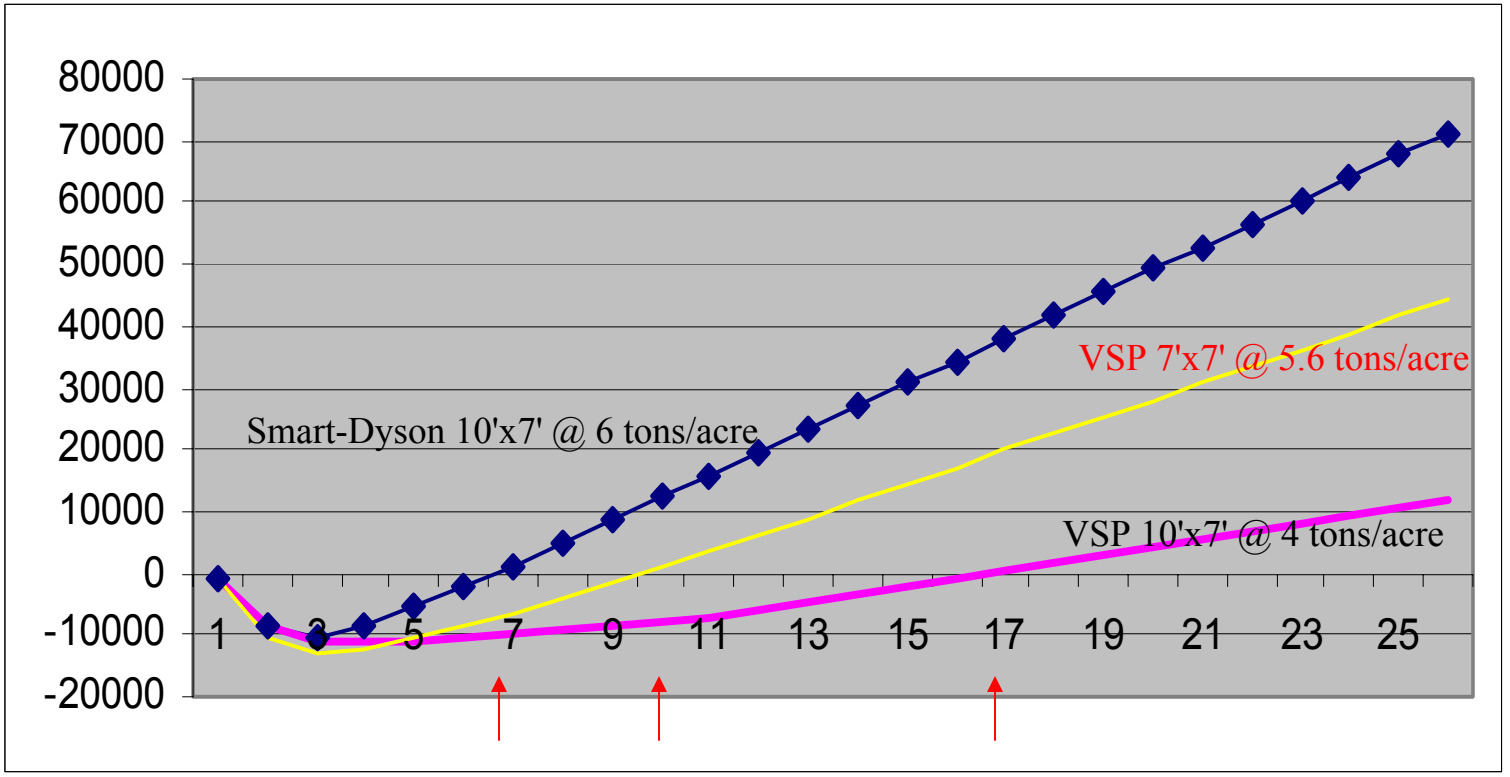
Cumulative cash flow assessment (0 to 25 years) (values are $/acre)



Cumulative cash flow assessment
Values are $/acre

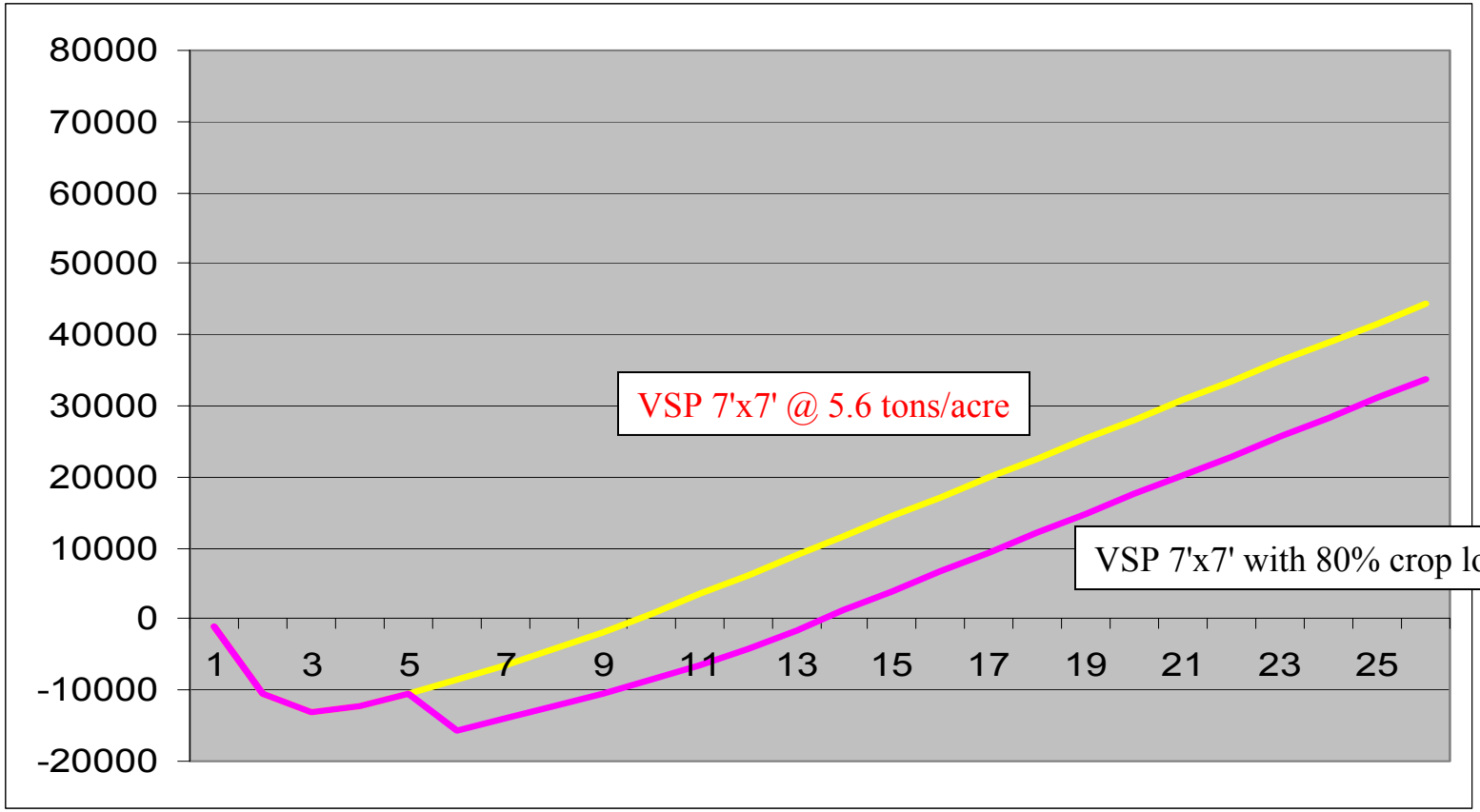


Cumulative cash flow assessment
Values are $/acre



Cumulative cash flow assessment

What happens with an 80% crop loss (e.g. frost) in Year 5?



Conclusions

- Vineyards are a labor- and capital-intensive enterprise
- It takes considerable time for a vineyard to become profitable; the smaller the vineyard, the more time involved.
- Row spacing and vine training, which affect yield, will have a major impact on vineyard profitability.

“Ideal” vineyard

- Manage capital assets (purchase used equipment, avoid buying unnecessary equipment, etc.)
- Use your own equity rather than paying interest on someone else’s equity
- Excellent site to avoid catastrophic crop loss
- High value crop with “high” yields of high quality fruit (close rows and divided canopy training)
- Acreage of 15 to 30 acres to make most efficient use of capital purchases, such as a sprayer or tractor
- IRRs can approach 15% by year 9 with above scenario

Some helpful resources

The Economics of Wine Grape Production in Virginia (1998) VCE Publication #463-008

www.ext.vt.edu/pubs/viticulture/463-008/463-008.html

Vineyard Economics, IN: Oregon Viticulture (2003), Oregon State University Press, Corvallis.

Cost of establishment and production of vinifera grapes in the Finger Lakes region of New York, 2001. White and Pisoni, Cornell University (2002)

http://dspace.library.cornell.edu/handle/1813/424