

2006 Lake County Winegrape Commission Grower Interest Survey Results
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Summary

The 43 surveys returned in the 2006 LCWC Grower Interest Survey indicate that Lake County winegrape growers want to know more about winegrowing to improve wine quality and want assistance with how to market and sell their grapes. Topics consistently rated as important to growers included the influence of viticulture on wine composition and flavor and winemaker preferences for varietal characteristics. Growers with smaller vineyard sizes were more likely to list marketing tools as an important topic in education than were growers with vineyards over 100 acres in size. When asked to list additional topics for education, however, growers owning both large and small vineyard acreage listed numerous sales and marketing related topics that they would like to know more about.

Other topics consistently rated as important for education and research include mechanization of vineyard operations, yield estimation, vine fertility, vertebrate pests, organic amendments, and irrigation scheduling. The complete ranking of grower priorities in education and research as well as the additional topics that growers suggested will provide a valuable tool to design the LCWC education and research program.

Large and small vineyard owners/managers differed on some priorities. Large growers (over 100 acres of vineyard) wanted to know more about site characterization, “terroir”, and environmental regulations, unlike small vineyard owners. Cover crops were of more interest to small than to large growers.

Growers responding to the survey were satisfied with the number of grower meetings offered by the LCWC and were reading the grower newsletter. Two out of three respondents were using the LCWC sponsored weather forecasts, however only 20% use them during winter months. Therefore eliminating winter forecasts would be the most reasonable approach to reducing the weather forecast service costs.

66% of growers were interested in data management software to track basic viticulture data, however only 44% said they would use software to communicate vineyard information to wineries.

Introduction

Two hundred surveys were sent out to Lake County Winegrape growers and vineyard staff on the LCWC mailing list. Forty-three surveys were returned, representing 3,766.5 acres of the county’s approximately 8,500 acres of vineyard. Two surveys returned did not report acreage. This report discusses the main results of the survey, while complete tables of results are given in Appendices.

High priority education and research topics

Growers were asked to rate their interest in fifty-four viticulture and production topics and one marketing topic. The topics of most interest to growers were determined based on the average scores for each topic (low indicating greater interest than high) and the percentage of scores that were ones. (A one indicates that the respondent was very interested in the topic). In addition, these analyses were weighted by acreage reported on the surveys. (For example a grower with 10 acres would have his/her score multiplied by 10, a grower with 100 acres would have it multiplied by 100.) This gave four ways of assessing which topics were of greatest interest to growers (Table 1). When there was more than one respondent from the same company, the company’s acreage was divided among the respondents before the scores were weighted. Results from this survey could represent some acreage twice if a survey from a vineyard owner and a vineyard management company managing the same acreage both returned surveys.

Table 1. Four methods to assess which topics were of greatest interest to growers.

Average of grower scores	Average of grower scores after weighting by acreage.
Percentage of scores receiving a 1	Percentage of scores receiving a 1 after weighting by acreage.

Seven topics rated in the top 12 for interest by all four assessment methods. They were:

- Influence of viticulture on wine composition and flavor
- Winemaker preferences for varietal characteristics
- Vertebrate pests
- Yield estimation
- Mechanization- for weed control, canopy management, harvest, pruning
- Vine nutrient requirements, fertilization, fertigation
- Organic amendments, e.g. compost, manure, plow down cover crops

One topic, Irrigation scheduling, deficit irrigation was in the top 12 in three out of the four assessment methods. The top 12 topics rated by the four methods are shown in Table 2 and the complete rankings of topics are in Appendix A.

Table 2. Rankings of Education and Research topics by growers, with and without weighting by acreage.

Average of Grower Scores			Average of Grower Scores after Weighting by Acreage		
Rank	Topic	Score	Rank	Topic	Score
1	Vine nutrients, fertilization	1.63	1	Influence of viticulture on wine	1.48
2	Influence of viticulture on wine	1.74	2	Mechanization	1.68
3	Organic amendments	1.83	3	Irrigation scheduling, deficit irr.	1.76
4	Marketing tools	1.95	4	Yield estimation	1.83
5	Mechanization	1.95	5	Armillaria	1.83
6	Winemaker preferences	1.96	6	Site characterization, terroir	1.87
7	Petiole sampling, interpretation	1.98	7	Vertebrate pests	1.97
8	Cover crops	1.98	8	Spider mites	2.05
9	Vertebrate pests	1.98	9	Organic amendments	2.05
10	Yield estimation	2.00	10	Environmental regulations	2.05
11	Plant, soil water monitoring	2.02	11	Winemaker preferences	2.08
12	Insects, mites	2.02	12	Vine nutrients, fertilization	2.09
Percentage of scores receiving a 1			Percentage of scores receiving a 1 after weighting by acreage.		
Rank		% 1s	Rank		% 1s
1	Influence of viticulture on wine	53.8%	1	Influence of viticulture on wine	69.1%
2	Vine nutrients, fertilization	51.3%	2	Irrigation scheduling, deficit irr.	57.6%
3	Organic amendments	48.7%	3	Site characterization, terroir	54.2%
4	Marketing tools	43.6%	4	Armillaria	50.9%
5	Vertebrate pests	41.0%	5	Yield estimation	50.4%
6	Yield estimation	41.0%	6	Mechanization	45.4%
7	Winemaker preferences	41.0%	7	Winemaker preferences	44.9%
8	Mechanization	38.5%	8	Environmental regulations	40.3%
9	Monitoring fruit maturity	38.5%	9	Vine nutrients, fertilization	40.0%
10	Irrigation scheduling, deficit irr.	35.9%	10	Vertebrate pests	35.1%
11	Petiole sampling, interpretation	35.9%	11	Viticulture plan	28.4%
12	Cover crops	33.3%	12	Organic amendments	27.6%

There were a few differences in priorities for education and research between large and small vineyard owners/managers. The assessments weighted by acreage generally represent the scores from larger growers because 82% of the vineyards represented in the survey were from vineyards of 100+ acres (Table 3). Larger growers (weighted assessments) showed a greater interest in site characterization, terroir, and environmental regulations than did smaller growers (unweighted assessments). Smaller growers showed a greater interest in marketing approaches and tools, and cover crops than did larger growers. The top 10 priority topics for the four vineyard size categories in Table 3, are shown in Appendix B.

Table 3. Number of survey respondents and acreage represented based on four vineyard size categories.*

Size category for vineyards represented by respondent	Number of respondents in each category	Total acres represented by respondents in each category
5 acres or less	6	18.5
5.1-20 acres	11	129.5
20.1-100 acres	14	514.5
100 acres or more	10	3104.0

*Size category indicates all vineyards owned/managed by respondent although this may include multiple vineyards in multiple locations. When acreage was divided by multiple respondents for one vineyard property the acreage was still large enough to keep them in the 100+ size category.

Management and control of oak root fungus (*Armillaria*) was a top 10 topic based on weighted scores and weighted % of 1's but not for the unweighted assessments. This probably reflects that most larger acreage respondents have hillside vineyards where *Armillaria* appears to be a more common problem than in valley locations. Similarly spider mites, which are a more common pest in hillside than valley vineyards, made the top 10 list for weighted scores but not for unweighted scores.

Because the scoring method (1 for very interested, 2 for somewhat interested, 3 for neutral) may not have allowed respondents to indicate their highest priority topics, they were also asked to list up to six topics of greatest interest (results in Appendix C). This approach gave results generally similar to the four assessment methods discussed above. The two topics most frequently chosen were marketing approaches and tools and yield estimation.

The survey also asked respondents to think of additional topics in viticulture and production that they would like to see in the LCWC education program. By far the most common concern was related to selling winegrapes and included topics such as how to attract winery clients, custom crush, writing contracts, out of state sales, and the economics of winegrape growing. The complete list of topics suggested by growers is given in Appendix D.

Size and Structure of LCWC Education Program

Growers were asked a series of short answer questions to help understand whether the number of meetings and educational offerings by the LCWC were meeting their needs. Their responses are divided into four vineyard acreage categories, and are given for all the respondents in Table 4.

Nearly all Growers indicated that the LCWC offers the right amount of grower education, and growers were generally satisfied by the amount of pest management continuing education hours offered (by a ratio of 2:1).

By a ratio of 17 to 13 growers did not think more training and education in Spanish was needed, however the negative response was primarily from vineyards in the 20-100 acre category. In contrast, companies with over 100 acres (representing eighty percent of vineyard acreage reporting) requested more hours of Spanish education by a ratio of 5 to 2.

Suggestions for Spanish education topics were: pest identification (4 responses), pruning (2 responses), training young vines (2 responses), canopy management (2 responses), pesticide safety/worker safety (2 responses), labor laws, spraying, MSDS, lifting, tractors, irrigation, vine physiology, and anything about latest farming methods.

Survey respondents reported a total attendance to meetings of 174 (vineyard owners/managers and employees).

All respondents reported that they read the grower newsletter (or did not answer the question.) Suggestions for improvement were: “Include presentation material or post on web”, “Newsletter topics categorized and posted on website. Add articles of interest from other publications, Farm Advisors Notes!”, “More scientific data and analysis of trials being conducted in Lake County”, “Maybe some personal stories of success? How a grower was able to improve quality through vit. practices?”.

Table 4. Number of responses to questions regarding the education program size and content by for four acreage categories and for all surveys.

	5 acres or less (6 surveys)	5.1-20 acres (11 surveys)	20.1-100 acres (14 surveys)	Over 100 acres (10 surveys)	All Surveys* (43 surveys)
4. The LCWC provides the right amount of grower education (R), should offer more grower meetings (M), should offer fewer grower meetings (F), no answer (NA)					
R	5	6	13	8	32
M	0	3	0	0	3
F	0	0	1	1	2
NA	1	2	0	1	6
5. Through grower meetings, the LCWC provides approximately 10 hours per year of pest management continuing education credits. Would you like to see more hours of CE credit offered?					
Yes	0	6	1	3	10
No	5	2	9	4	21
NA	1	3	4	3	13
6. Would you like to see more training and education offered in Spanish?					
Yes	3	3	2	5	13
No	2	2	10	2	17
NA	1	6	2	3	13
8. How many LCWC sponsored meetings did you and your employees attend last year?					
Grower	10	26	20	13	79
Employees	0	0	24	71	95
Total	10	26	54	84	174
9. Do you read the LCWC grower newsletter?					
Yes	5	10	13	9	38
No	0	0	0	0	0
NA	1	1	1	1	5

*Includes two surveys that did not report acreage.

Vineyard Software

Ideas for pursuing grants to provide vineyard data management software to growers have been discussed in the LCWC Education and Research Committee and Board of Directors meetings. Questions were asked to clarify whether there was interest in this software and what kind of vineyard software growers would find useful (Table 5).

By a ratio of 2:1 growers were interested in software to track basic viticulture data, and this response was more positive as vineyard size increased. In contrast growers did not favor software to communicate information to wineries (16:20 ratio), although at the largest size category it was favored by 5:4. Three respondents mentioned that whether they would want software would depend on the cost.

Table 5. Number of responses to questions regarding computer software needs for four acreage categories and for all surveys.

	5 acres or less (6 surveys)	5.1-20 acres (11 surveys)	20.1-100 acres (14 surveys)	Over 100 acres (10 surveys)	All Surveys* (43 surveys)
10. Would you be interested in having computer software to track basic viticulture data if training were provided?					
Yes	3	6	8	7	25
No	2	4	4	2	13
NA	1	1	2	1	5
11. Would you be interested in having computer software to communicate information such as block description (rootstock, variety, clone, spacing, etc.), crop estimates, and maturity data to wineries to which you are selling fruit if training were provided?					
Yes	1	5	5	5	16
No	3	4	7	4	20
NA	2	2	2	1	7

*Includes two surveys that did not report acreage.

Weather Forecasting Service

Growers were surveyed to determine whether and at what times of year they are using the weather forecasting service (Table 6). Twice as many growers use the weather forecasts (27) as do not (13). When asked what times of year they use the forecasts, only 7 use the forecasts all year. This is 17.5% of those answering the question. Similarly, those using the forecasts all year represent 21% of the acreage of those who answered the question. Based on these results, about 20% of LCWC growers would be affected if winter weather forecasting were eliminated.

Table 6. Number of responses and acreage represented by respondents for questions regarding use of weather forecasting services.

	5 acres or less (6 surveys)	5.1-20 acres (11 surveys)	20.1-100 acres (14 surveys)	Over 100 acres (10 surveys)	All Surveys* (43 surveys)
12. As a service to growers, the LCWC provides year-round weather forecasting through Western Weather Group. Do you use the forecasts provided through Western Weather Group?					
Yes	1	6	10	8	27
No	4	4	3	2	13
NA	1	1	1	0	3
12 cont'd. What times of the year do you use the forecasts? Frost season only (F), frost and growing season only (F, GR), all year (AY), Number of responses					
F	1	2	4	2	10
F,GR	0	2	3	4	9
AY	0	1	3	2	7
12 cont'd. Acres represented by responses in the above parts of question 12.					
F	1	29	174	409	613
F,GR	0	12.5	96	1620	1728.5
AY	0	9	115	655	779
No	16.5	41	89.5	420	567
NA	1	18	40	0	59

*Includes two surveys with no acreage reported.

The costs of the weather forecasting service were detailed in a footnote in the survey. Although they were not specifically asked, no growers expressed concerns about the cost of the forecasting service. One grower in the final question of the survey suggested that only fruit frost forecasting be provided. (See below.)

Additional Suggestions

In question 13 growers were asked for any additional suggestions for the LCWC Education and Research program. Most of the responses are listed here, however suggestions from one survey fit better with question 3 and are included in the list of additional topics in viticulture and production in Appendix C. The other responses were: “Again- Web based on line courses, presentations, references, etc. (Some good info already on the web.)”, “I would like to see all communications on line”, “Printed newsletters are to me helpful. My computer skills are zero.”, “More offerings in Spanish”, “Just March to May fruit frost forecasting”, “Doing a good job”, “I think you do a GREAT JOB!”, “The geology meeting held at Konocti was great as was the wine marketing meeting that was held some time ago. The meetings held at the Finley Grange have all been informative. LCWC Ed & Research does a great job. Thank you.”, “Keep up the great work.”, “I think everyone involved in LCWC is doing a very good job.”, “I am impressed by the current program.”

Some implications of the survey results for the LCWC Education & Research program

Grower prioritization of research and education topics as discussed above will assist the Education and Research Committee in developing its future programs. In particular, meetings focused on marketing that have been dropped in recent years, need to be offered again.

When the Education and Research Committee and LCWC Board of Directors discussed the idea of pursuing grant funding for viticulture data management software for growers, it was generally thought that software that could communicate vineyard block and harvest maturity data to wineries would be more widely appreciated by growers than would software to keep track of viticulture data. The responses to this survey, however, indicate the opposite.

Appendix A Priority Ranking of All Research and Education Topics

Topic Ranking Based on Average Score			Topic Rank Based on Acreage-Weighted Scores		
Rank	Topics	Score	Rank	Topic	Wtd. Score
1	12. Vine nutrient reqs., fertilization	1.63	1	45. Influence viticulture on wine	1.48
2	45. Influence viticulture on wine	1.74	2	40. Mechanization	1.68
3	13. Organic amendments	1.83	3	9. Irrigation scheduling, def. irrigation	1.76
4	55. Marketing tools	1.95	4	42. Yield estimation	1.83
5	40. Mechanization	1.95	5	25. Armillaria	1.83
6	46. Winemaker preferences	1.96	6	1. Terroir	1.87
7	11. Petiole sampling, interpretation	1.98	7	34. Vertebrate pests	1.97
8	14. Cover crops	1.98	8	28. Spider mites	2.05
9	34. Vertebrate pests	1.98	9	13. Organic amendments	2.05
10	42. Yield estimation	2.00	10	5. Environmental regs.	2.05
11	10. Plant, soil water status monitoring	2.02	11	46. Winemaker preferences	2.08
12	27. Insects, mites	2.02	12	12. Vine nutrient reqs., fertilization	2.09
13	15. Organic farming	2.10	13	15. Organic farming	2.15
14	19. Canopy mgt., balance assessmt.	2.10	14	22. Powdery mildew	2.21
15	9. Irrigation scheduling, def. irrigation	2.10	15	27. Insects, mites	2.26
16	41. Monitoring fruit maturity	2.10	16	24. Eutypa	2.30
17	28. Spider mites	2.10	17	36. Alternative weed control	2.33
18	36. Alternative weed control	2.12	18	11. Petiole sampling, interpretation	2.33
19	39. Reduced risk pesticides	2.12	19	39. Reduced risk pesticides	2.34
20	22. Powdery mildew	2.21	20	20. Weather data, models for pest,dis.	2.35
21	43. Juice chemistry	2.22	21	48. Grapevine physiology	2.37
22	48. Grapevine physiology	2.22	22	4. Variety, clone, rootstock	2.40
23	20. Weather data, models for pest,dis.	2.24	23	10. Plant, soil water status monitoring	2.41
24	25. Armillaria	2.24	24	41. Monitoring fruit maturity	2.45
25	47. Pruning	2.26	25	53. Energy use reduction	2.48
26	44. Technical wine tasting	2.27	26	19. Canopy mgt., balance assessmt.	2.49
27	8. Irrigation system maintenance	2.29	27	49. Habitat management	2.50
28	29. Leaf hoppers	2.31	28	44. Technical wine tasting	2.54
29	32. VMB	2.31	29	14. Cover crops	2.54
30	4. Variety, clone, rootstock	2.32	30	33. Nematodes	2.54
31	24. Eutypa	2.36	31	51. Water quality issues, mgt.	2.55
32	1. Terroir	2.37	32	32. VMB	2.55
33	37. Sprayer technology, calib., maint.	2.37	33	55. Marketing tools	2.56
34	53. Energy use reduction	2.37	34	47. Pruning	2.59
35	49. Habitat management	2.46	35	29. Leaf hoppers	2.66
36	6. Frost protection	2.48	36	37. Sprayer technology, calib., maint.	2.66
37	5. Environmental regs.	2.49	37	26. Young vine decline	2.68
38	35. Conventional weed control	2.49	38	2. Pre-plant soil test & prep.	2.73
39	26. Young vine decline	2.50	39	54. Viticulture plan	2.76
40	23. Bunch rots	2.52	40	6. Frost protection	2.77
41	30. Pierce's disease	2.53	41	8. Irrigation system maintenance	2.79
42	54. Viticulture plan	2.56	42	38. Pesticide safety training	2.79
43	16. Biodynamic farming	2.59	43	43. Juice chemistry	2.80
44	3. Trellis, spacing, orientation	2.60	44	35. Conventional weed control	2.80
45	33. Nematodes	2.60	45	21. Viruses, clean stock	2.82
46	51. Water quality issues, mgt.	2.64	46	50. Watershed management	2.85
47	21. Viruses, clean stock	2.73	47	3. Trellis, spacing, orientation	2.87
48	38. Pesticide safety training	2.73	48	52. Air quality issues, mgt.	2.88
49	31. Phylloxera	2.76	49	23. Bunch rots	2.93
50	52. Air quality issues, mgt.	2.78	50	30. Pierce's disease	2.99
51	7. Irrigation system design	2.80	51	17. Erosion control	2.99
52	50. Watershed management	2.83	52	7. Irrigation system design	3.10
53	2. Pre-plant soil test & prep.	2.88	53	18. Training young vines	3.17
54	17. Erosion control	2.93	54	31. Phylloxera	3.30
55	18. Training young vines	2.93	55	16. Biodynamic farming	3.51

Appendix A Continued

Topic Ranking Based on % of 1 Scores			Topic Ranking Based on % 1s After Weighting by Acreage		
Rank	Topics	% 1s	Rank	Topic	Wtd. %1s
1	45. Influence viticulture on wine	53.8%	1	45. Influence viticulture on wine	69.1%
2	12. Vine nutrient reqs., fertilization	51.3%	2	9. Irrigation scheduling, def. irrigation	57.6%
3	13. Organic amendments	48.7%	3	1. Terroir	54.2%
4	55. Marketing tools	43.6%	4	25. Armillaria	50.9%
5	34. Vertebrate pests	41.0%	5	42. Yield estimation	50.4%
6	42. Yield estimation	41.0%	6	40. Mechanization	45.4%
7	46. Winemaker preferences	41.0%	7	46. Winemaker preferences	44.9%
8	40. Mechanization	38.5%	8	5. Environmental regs.	40.3%
9	41. Monitoring fruit maturity	38.5%	9	12. Vine nutrient reqs., fertilization	40.0%
10	9. Irrigation scheduling, def. irrigation	35.9%	10	34. Vertebrate pests	35.1%
11	11. Petiole sampling, interpretation	35.9%	11	54. Viticulture plan	28.4%
12	14. Cover crops	33.3%	12	13. Organic amendments	27.6%
13	19. Canopy mgt., balance assessmt.	33.3%	13	4. Variety, clone, rootstock	25.7%
14	15. Organic farming	30.8%	14	22. Powdery mildew	25.5%
15	36. Alternative weed control	30.8%	15	55. Marketing tools	25.3%
16	43. Juice chemistry	30.8%	16	49. Habitat management	24.9%
17	48. Grapevine physiology	30.8%	17	10. Plant, soil water status monitoring	24.1%
18	1. Terroir	28.2%	18	53. Energy use reduction	24.1%
19	10. Plant, soil water status monitoring	28.2%	19	19. Canopy mgt., balance assessmt.	24.0%
20	25. Armillaria	28.2%	20	44. Technical wine tasting	24.0%
21	44. Technical wine tasting	28.2%	21	41. Monitoring fruit maturity	23.6%
22	22. Powdery mildew	25.6%	22	20. Weather data, models for pest,dis.	23.0%
23	5. Environmental regs.	23.1%	23	36. Alternative weed control	22.6%
24	8. Irrigation system maintenance	23.1%	24	11. Petiole sampling, interpretation	21.0%
25	24. Eutypa	23.1%	25	39. Reduced risk pesticides	19.7%
26	39. Reduced risk pesticides	23.1%	26	51. Water quality issues, mgt.	19.5%
27	53. Energy use reduction	23.1%	27	52. Air quality issues, mgt.	17.8%
28	4. Variety, clone, rootstock	20.5%	28	15. Organic farming	17.6%
29	6. Frost protection	20.5%	29	48. Grapevine physiology	16.9%
30	16. Biodynamic farming	20.5%	30	32. VMB	16.4%
31	20. Weather data, models for pest,dis.	20.5%	31	24. Eutypa	15.0%
32	27. Insects, mites	20.5%	32	28. Spider mites	14.5%
33	35. Conventional weed control	20.5%	33	27. Insects, mites	14.0%
34	54. Viticulture plan	20.5%	34	6. Frost protection	14.0%
35	23. Bunch rots	17.9%	35	29. Leaf hoppers	13.1%
36	28. Spider mites	17.9%	36	43. Juice chemistry	12.6%
37	29. Leaf hoppers	17.9%	37	35. Conventional weed control	12.4%
38	32. VMB	17.9%	38	26. Young vine decline	12.4%
39	49. Habitat management	17.9%	39	21. Viruses, clean stock	11.9%
40	37. Sprayer technology, calib., maint.	15.4%	40	8. Irrigation system maintenance	10.7%
41	47. Pruning	15.4%	41	3. Trellis, spacing, orientation	10.2%
42	26. Young vine decline	12.8%	42	14. Cover crops	9.7%
43	33. Nematodes	12.8%	43	38. Pesticide safety training	8.2%
44	51. Water quality issues, mgt.	12.8%	44	33. Nematodes	7.8%
45	2. Pre-plant soil test & prep.	10.3%	45	23. Bunch rots	5.6%
46	3. Trellis, spacing, orientation	10.3%	46	2. Pre-plant soil test & prep.	4.9%
47	7. Irrigation system design	10.3%	47	16. Biodynamic farming	4.0%
48	17. Erosion control	10.3%	48	37. Sprayer technology, calib., maint.	3.9%
49	30. Pierce's disease	10.3%	49	17. Erosion control	2.6%
50	38. Pesticide safety training	10.3%	50	7. Irrigation system design	2.2%
51	52. Air quality issues, mgt.	7.7%	51	47. Pruning	2.0%
52	18. Training young vines	5.1%	52	18. Training young vines	1.9%
53	21. Viruses, clean stock	5.1%	53	50. Watershed management	1.2%
54	31. Phylloxera	5.1%	54	30. Pierce's disease	1.0%
55	50. Watershed management	5.1%	55	31. Phylloxera	0.5%

Appendix B Top 10 Priority Topics for Four Sizes of Vineyard Ownership
5 acres or less (6 responses)

Top 10 Topics, from 1 to 10	Average Score	Top 10 Topics, from 1 to 10	% 1's
12. Vine nutrient reqs., fertilization	1.17	12. Vine nutrient reqs., fertilization	83.3%
13. Organic amendments	1.17	13. Organic amendments	83.3%
36. Alternative weed control	1.33	15. Organic farming	66.7%
15. Organic farming	1.50	36. Alternative weed control	66.7%
22. Powdery mildew	1.50	43. Juice chemistry	66.7%
45. Influence viticulture on wine	1.50	45. Influence viticulture on wine	66.7%
46. Winemaker preferences	1.50	46. Winemaker preferences	66.7%
9. Irrigation scheduling, def. irrigation	1.67	9. Irrigation scheduling, def. irrigation	50.0%
14. Cover crops	1.67	11. Petiole sampling, interpretation	50.0%
41. Monitoring fruit maturity	1.67	14. Cover crops	50.0%

5.1-20 acres (11 responses)

Top 10 Topics, from 1 to 10	Average Score	Top 10 Topics, from 1 to 10	% 1's
13. Organic amendments	1.67	13. Organic amendments	45.5%
14. Cover crops	1.70	14. Cover crops	45.5%
12. Vine nutrient reqs., fertilization	1.78	11. Petiole sampling, interpretation	36.4%
55. Marketing tools	1.78	34. Vertebrate pests	36.4%
11. Petiole sampling, interpretation	1.80	39. Reduced risk pesticides	36.4%
48. Grapevine physiology	1.80	45. Influence viticulture on wine	36.4%
1. Terroir	1.89	48. Grapevine physiology	36.4%
34. Vertebrate pests	1.91	55. Marketing tools	36.4%
10. Plant, soil water status monitoring	2.00	1. Terroir	27.3%
15. Organic farming	2.00	10. Plant, soil water status monitoring	27.3%

20.1-100 acres (14 responses)

Top 10 Topics, from 1 to 10	Average Score	Top 10 Topics, from 1 to 10	% 1's
12. Vine nutrient reqs., fertilization	1.57	12. Vine nutrient reqs., fertilization	57.1%
19. Canopy mgt., balance assessmt.	1.71	19. Canopy mgt., balance assessmt.	57.1%
45. Influence viticulture on wine	1.79	41. Monitoring fruit maturity	50.0%
40. Mechanization	1.85	45. Influence viticulture on wine	50.0%
55. Marketing tools	1.92	55. Marketing tools	50.0%
10. Plant, soil water status monitoring	1.93	9. Irrigation scheduling, def. irrigation	42.9%
11. Petiole sampling, interpretation	1.93	13. Organic amendments	42.9%
13. Organic amendments	1.93	34. Vertebrate pests	42.9%
34. Vertebrate pests	1.93	40. Mechanization	42.9%
41. Monitoring fruit maturity	1.93	10. Plant, soil water status monitoring	35.7%

Greater than 100 acres (10 responses)

Top 10 Topics, from 1 to 10	Average Score	Top 10 Topics, from 1 to 10	% 1's
42. Yield estimation	1.6	42. Yield estimation	60.0%
45. Influence viticulture on wine	1.6	45. Influence viticulture on wine	60.0%
46. Winemaker preferences	1.85	5. Environmental regs.	50.0%
12. Vine nutrient reqs., fertilization	1.9	46. Winemaker preferences	50.0%
34. Vertebrate pests	1.9	1. Terroir	40.0%
40. Mechanization	1.9	9. Irrigation scheduling, def. irrigation	40.0%
25. Armillaria	2	12. Vine nutrient reqs., fertilization	40.0%
5. Environmental regs.	2.1	25. Armillaria	40.0%
11. Petiole sampling, interpretation	2.1	4. Variety, clone, rootstock	30.0%
27. Insects, mites	2.1	11. Petiole sampling, interpretation	30.0%

Appendix C

Number of Times Topic Were Chosen as Respondents' Top Six Priorities.

Number	Topic
9	Yield estimation
9	Marketing approaches and tools
8	Organic amendments, e.g. compost, manure, plow down cover crops
8	Cover crops
8	Canopy management and vine balance assessment
8	Influence of viticulture on wine composition and flavor
7	Vine nutrient requirements, fertilization, fertigation
7	Organic farming methods
6	Vertebrate pest management- birds, gophers, squirrels
6	Juice chemistry
5	Variety, clone and rootstock selection
5	Monitoring of fruit ripening and maturity
5	Winemaker preferences for varietal characteristics
4	Site characterization ('terroir')- geology, soils, climate
4	Frost protection- sprinkler type, dew point and turn on time, frost forecast availability
4	Irrigation system maintenance
4	Irrigation scheduling, deficit irrigation
4	Petiole and soil sampling and interpretation of results
4	Management and control of oakroot fungus (Armillaria)
4	Spider mite management and control
4	Energy use reduction
3	Pre-plant soil testing and preparation- ripping, amendments, etc.
3	Biodynamic farming methods
3	Management and control of powdery mildew
3	Leaf hopper management and control
3	Nematodes
3	Reduced risk pesticide options- alternative materials and methods
3	Mechanization- for weed control, canopy management, harvest, pruning
3	Technical wine tasting
2	Trellis design, vine and row spacing, row orientation
2	Management and control of bunch rots
2	Management and control of Eutypa dieback
2	Pierce's disease, Glassy winged and other sharpshooters, habitat management
2	Weed control using conventional herbicides and methods
2	Sprayer technology, calibration, maintenance
2	Air quality issues and management
1	Environmental regulations and vineyard development
1	Irrigation system design
1	Plant and soil water status monitoring
1	Erosion control
1	Use of weather data and computer models for pest and disease management
1	Young vine decline
1	Insect and mite pests, monitoring, record keeping and use of economic thresholds
1	Phylloxera
1	Vine mealybug
1	Alternative weed control-propane burners, tillage, cover crops
1	Pruning
1	Grapevine physiology- fruit set, fruit development, photosynthesis regulation
1	Habitat management for wildlife, natural enemies
1	Watershed management
1	Water quality issues and management
1	Developing a viticulture plan as a management and winery communication tool
0	Training young vines
0	Virus diseases, clean stock and nursery certification programs
0	Pesticide safety training- storage, mixing and loading, drift management

Appendix D. Additional Topics in Viticulture and Production Suggested by Growers.

Sales-marketing-economics

1. Closer relationship between buyer (winery or broker) and farmer. What exactly are they looking for?
2. Market analysis, pricing
3. Mostly marketing- where can I sell my grapes when my contract expires.
4. How to attract boutique buyers
5. How to sell uncontracted grapes!
6. Contracts- current market price vs. spot market
7. Formulas-price/unit, tons/gallons
8. Custom crush vs. let them hang.
9. Bulk market indicators
10. Out of state sales, differences in labeling laws, varietal, appellation, transportation, alcohol content, proprietorship
11. World marketplace and how it may affect pricing, over supply, forecasting by variety and region, etc.
12. Contracts and what they mean
13. Gaining winery contracts
14. Contracts- pros and cons
15. Economics of grape growing
16. Winegrape economics
17. Finding ways to cut costs in vineyards and increase yields yet maintain or improve perceived quality (ripeness and flavor)

Site-Terroir

1. Site, soil, weather influence on quality
2. Terroir & wine quality
3. Identifying specific traits and characteristics that define our growing region

Irrigation

1. Irrigation management-3 respondents wrote this

Organic-Biodynamic-Alternative Approaches

1. Alternative & less costly weed control
2. Organic pest control, i.e. leafhoppers & mites
3. Organic, biodynamic vine fertility management

Heat damage

1. Global warming- sunburn control
2. Addressing intense heat (high temperatures)

Soils and Fertility

1. Macro and micronutrients, how to visually Id.
2. How each effects growth and maturity, and how different soils might affect their uptake.
3. Root vs. leaf uptake
4. Basic relations between nutrients, i.e. Calcium and Magnesium
5. Soils within blocks- management

Pest Management

1. New spray materials available & pros and cons of these materials
2. Insect thresholds

Cover Crops

1. Wall to wall cover crops
2. Cover crops to achieve different goals e.g. competition, mycorrhizal association, drying out wet soil in the spring
3. Weed control with cover crops

Other topics

1. Demonstration how to measure pH and TA in juice
2. More technical wine tastings combined with viticulture influences. No one can have enough technical wine tasting.- Very important!
3. Dealing with state government agencies and their requirements vs. county agencies. This is a quagmire that tends to bury people!
4. Harvesting- mechanical vs. hand labor
5. Changing wine styles
6. I'd like to see some blind tastings- Lake Co. Napa, Sonoma & Mendocino
7. Illegal aliens
8. Computer modeling
9. Hang time & the chemical changes that take place- especially with tannins- both good and bad effects and tasting for them to determine break point
10. Sulfur dust drift management vs. air quality issues
11. Neighbor relations outreach programs
12. Not topics- more techniques: mailings, on-line classes or references, etc.
13. Other types of frost control including row/weed management, mowing, fans
14. Pests