

# **Ten Years of Lodi-Woodbridge Winegrape Commission's Biologically Integrated Farming System Program**

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## **Introduction**

In 1995 the Lodi-Woodbridge Winegrape Commission (LWWC) was awarded one of two inaugural grants from the University of California's Sustainable Agriculture Research and Education Program's (UC SAREP) Biologically Integrated Farming Systems Program (BIFS). The three-year grants were intended to be seed money to establish programs that growers would continue into the future once the grant money ended. The winegrape growers of LWWC's BIFS program have done just that with 2006 being the 11<sup>th</sup> field season of their BIFS program.

LWWC is a grower commission formed in 1991 by a vote of the winegrape growers in California Crush District #11. It is funded by an assessment on the annual value of growers' winegrape crops. There are currently about 750 LWWC member growers farming over 90,000 acres of winegrapes which comprises about 20% of the winegrape production in California.

Lodi winegrape growers set three goals when LWWC was formed:

1. Differentiate Lodi in the marketplace as a producer of premium winegrapes and wine.
2. Fund research on local viticulture issues assisting Lodi growers to produce higher quality winegrapes.
3. Create and implement an area-wide integrated pest management (IPM) program.

In 1995, LWWC transitioned their IPM program into a sustainable winegrowing program and applied for a BIFS grant from UC SAREP to help accomplish this goal. The strength of the BIFS model of extension arises from the fact that it is grower-driven. Growers are the foundation of the program and their experience on the farm is recognized as a valuable addition to the body of knowledge that moves agriculture forward. Growers and pest control advisers (PCAs) are recognized as equal partners in the quest for better ways to grow crops in a more sustainable way. The BIFS model involves a team approach to agricultural project management with all the stakeholders, such as growers, PCAs, University personnel, commodity processors, and community members being a part of the team<sup>1</sup>.

The focus of LWWC's BIFS program was to encourage growers and PCAs to use sustainable farming practices that have been demonstrated to be effective. A 10-person management team of growers, PCAs, LWWC staff, University scientists, and a UC Cooperative Extension Farm Advisor was established to oversee the project during the BIFS grant. LWWC's Research Committee of growers, PCAs and UC Cooperative Extension Farm Advisors assumed this role at the conclusion of the UC SAREP BIFS grant in 1998.

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<sup>1</sup> Pence, R. A. 1998. Leveling the learning fields: An assessment of the Agricultural Partnership Model of BIOS-Merced and BIFS-Lodi. Dept. of Human and Community Development, University of California, Davis. 199pp.

## **LWWC's BIFS Program Structure**

### *Grower Outreach*

LWWC's BIFS program consisted of three components during the first three years: grower outreach, field implementation and evaluation. The initial goal of the grower outreach component was to introduce growers and PCAs to the concepts of biologically integrated farming and how to implement specific practices in their vineyards. It was directed at the entire LWWC membership and consisted of:

- Monthly breakfast meetings – where experts discuss specific sustainable winegrowing practices that have been field-tested and are ready for adoption.
- Twice yearly half-day research seminars – where scientists present information on cutting edge experiments where the results are not necessarily ready for implementation yet.
- Field days where sustainable farming practices are demonstrated in BIFS vineyards.
- Bimonthly newsletter featuring sustainable practices and profiles of BIFS growers.
- A website outlining the sustainable winegrowing program ([www.lodiwine.com](http://www.lodiwine.com)).
- Neighborhood grower meetings – held during the first 18 months of the BIFS grant where a grower invited neighbors over to their house to discuss the history, theory and practice of IPM with myself and Paul Verdegaal, the UCCE Viticulture Farm Advisor for San Joaquin County. Over 260 LWWC growers attended these meetings.

### *Field Implementation*

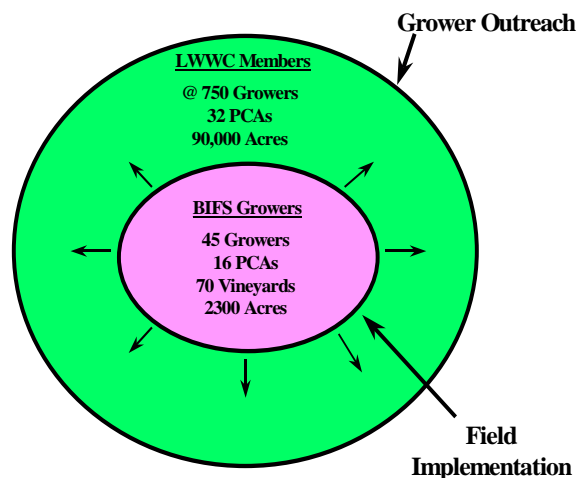
Following the initial grower outreach, the field implementation component was established. A call went out to LWWC growers asking for volunteers to join the BIFS program and become grower cooperators. They were asked to designate one or more of their vineyards as BIFS vineyards where they would implement and demonstrate the effectiveness of BIFS practices. Thirty growers signed up the first year and there were 45 BIFS growers by the beginning of the second year. All types of growers were included: those farming a few acres to some who farm several thousand acres. The PCAs working with these growers were also participants in the program. Most winegrape growers make farm management decisions in consultation with PCAs, so it was important to have everyone involved in farm management decision-making participating in the BIFS program.

The 45 LWWC BIFS growers together managed about 40% of the winegrape acreage in the district. The PCAs involved in the program were responsible for pest management recommendations for over 50% of the vineyard acres. Therefore even though only a small portion of Lodi growers were participating, the BIFS program had the potential to impact a significant portion of the acres in the district. When growers observed positive effects in their demonstration vineyards, they were likely to implement BIFS practices on the rest of their acreage.

By year two, the 45 BIFS growers had enrolled 70 vineyards in the BIFS program encompassing 2300 acres. Growers and LWWC staff recorded all the practices carried out in these vineyards including weekly pest monitoring, pesticide use, all vineyard floor management and viticultural practices, and yields. A state-of-the-art relational database system and field data collection

system were created to capture, enter and summarize all the data. The data from the BIFS program were shared at meetings of BIFS growers and PCAs and with the larger group of LWWC growers. Meetings with BIFS growers and PCAs were held to share data summaries from the past year and discuss their implications on vineyard practices. There were two meetings per year during the three-year life of the BIFS grant and since then BIFS grower meetings are held annually. At the beginning of the program the BIFS growers agreed that their names and vineyard locations should be included on all data summaries in order to enhance the learning process. They could then seek each other out with specific questions about why something was done or not done. There is a remarkable amount of candid data-sharing among the LWWC BIFS growers and PCAs.

The second method of data sharing occurred with the rest of the LWWC growers. This was done through field days at the BIFS vineyards where non-BIFS growers could see the sustainable practices in action and ask the BIFS growers any questions they might have. It is through this second method of information sharing that the power of the BIFS model to effect change becomes evident. Even though a small number of growers, in our case 45, are grower-cooperators, their practices affect a large number of growers through information exchange at meetings, in newsletter articles, and in one-on-one conversations between BIFS and non-BIFS growers. Figure 1 is a graphical representation of the model.



**Figure 1. Graphical representation of LWWC’s BIFS model indicating the flow of information from BIFS growers out into the greater grower community.**

*Program Evaluation*

The program evaluation component consists of two parts - the annual data summaries from the BIFS vineyards using the database, and the results of two district wide grower surveys. The surveys were conducted in 1998 and 2003 (response rate of 47% and 44%, respectively) and evaluated the quality of LWWC’s grower outreach activities, and how the BIFS program affected growers’ winegrowing practices and their attitudes / perceptions of IPM. Space does

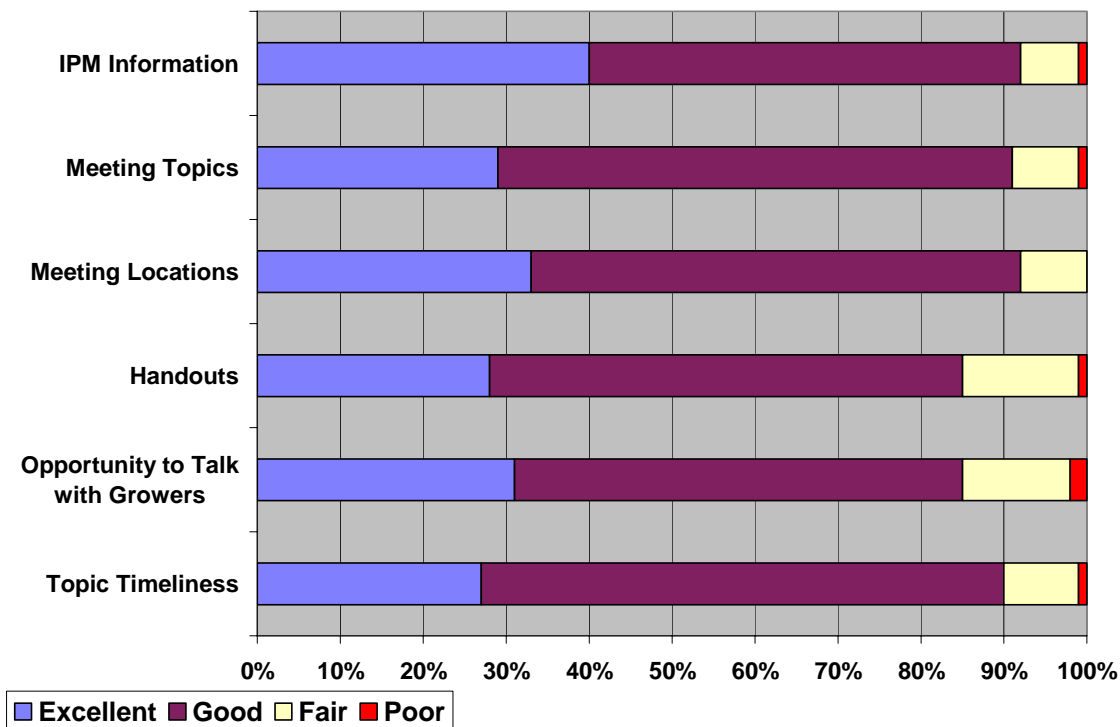
not permit a presentation of detailed results of 10 years of LWWC’s BIFS program<sup>2</sup>. However, some examples will be presented to give an indication of how the BIFS program has been received by Lodi winegrape growers.

Grower Outreach

LWWC staff put a significant amount of effort into grower outreach since the beginning of the BIFS program. Figures 2 and 3 summarize growers’ views of the BIFS meetings, a key element of the outreach program. It is evident from the graph in Figure 2 that Lodi growers think highly of the quality of the BIFS meetings. Over 85% of the respondents rated all the meeting elements as either good or excellent.

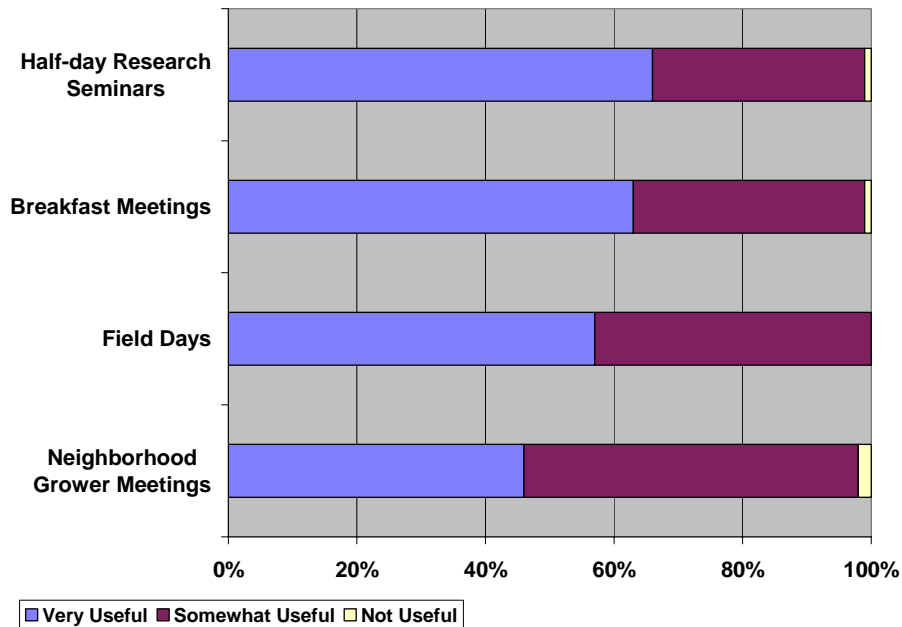
In addition to questions about the quality of the various meeting components, our assessment of the BIFS meetings also looked at the usefulness of the meetings. Figure 3 clearly indicates that Lodi growers feel that BIFS meetings are useful.

Similar results were recorded in the 2003 survey.



**Figure 2. Growers’ ratings of the quality of LWWC’s BIFS program meeting elements (1998 Grower Survey results).**

<sup>2</sup> A complete report of the results of the grower surveys carried out in 1998 and 2003 can be found at [www.lodirules.com](http://www.lodirules.com) under ‘Grower News’.

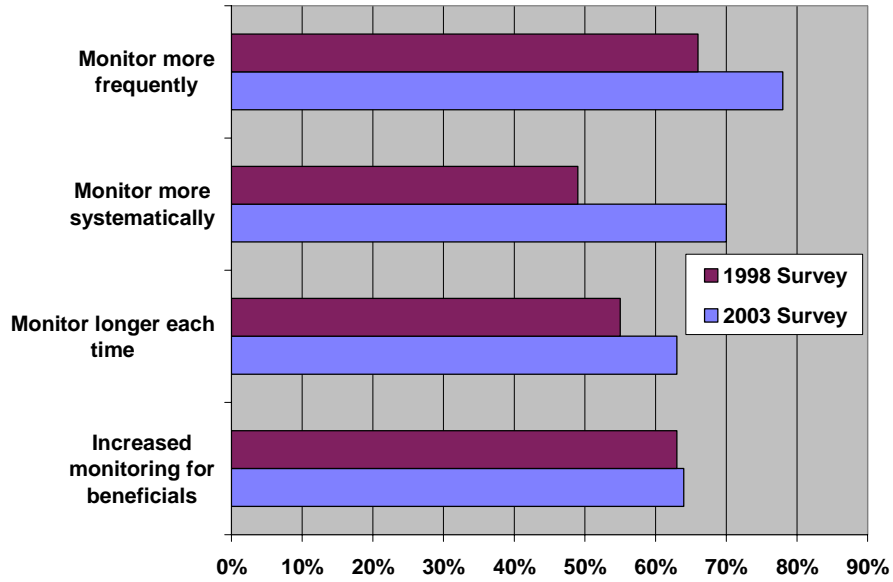


**Figure 3. Usefulness of LWWC’s BIFS meetings (1998 Grower Survey results).**

### Field Implementation

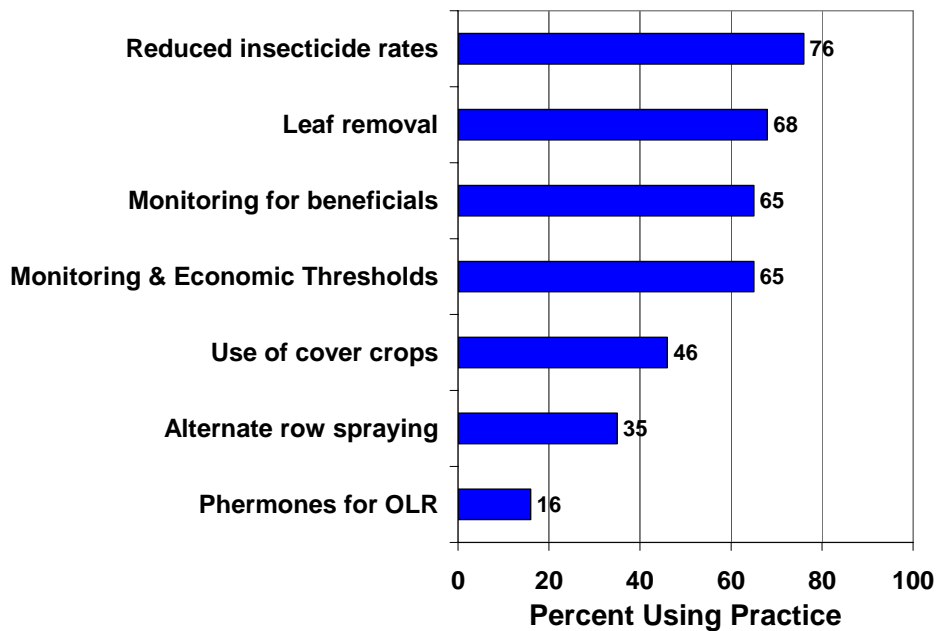
LWWC’s BIFS program emphasized to LWWC growers and PCAs the importance of using IPM to manage winegrape pests, including the use of frequent, systematic monitoring for pests and their natural enemies. Therefore, in both surveys growers were asked how the BIFS program had affected their monitoring frequency, thoroughness, and monitoring for pests and beneficials.

Results from the 1998 grower survey showed that after only 3 years, the BIFS program impacted each aspect of pest monitoring (Fig. 4) with over 65% of the growers reporting they monitor more frequently, almost 50% monitor more systematically, over 55% reported they spend more time monitoring, and over 60% increased their monitoring for beneficials. The results for the same questions in the 2003 grower survey showed that the BIFS program was still having an impact on grower monitoring (Fig. 4) indicated by the increase in percentage for each monitoring element. These results provide further evidence of the impact and effectiveness of the BIFS model for this group of growers.



**Figure 4. How has LWWC’s BIFS program influenced your monitoring program?**

Another way to gauge the impact of the BIFS program on growers’ IPM practices was to ask if they used specific practices. This was done in the 1998 survey and the results are summarized in Figure 5.



**Figure 5. Effects of BIFS program on IPM practices (1998 Grower Survey results).**

By 1998 over three quarters of the growers were using reduced insecticide rates, two thirds of the growers were monitoring for pest natural enemies and using monitoring and economic thresholds in their pest management programs. Almost half the growers were using cover crops.

Encouraging growers to monitor for pests using quantitative methods, record the results and use these data in pest management decision-making was another area of emphasis in LWWC's BIFS program. The point was made particularly well by using the BIFS database to summarize leafhopper monitoring and compare the counts in vineyards that were sprayed for leafhoppers to those that were not sprayed. In doing so it was readily apparent that the treatment threshold for leafhoppers was low for some growers but much higher for others, yet none suffered economic losses due to leafhopper damage. Although there are several things that enter into a grower's decision whether or not to treat a pest population, one of the most important elements is the perception of risk. If the risk of damage or crop loss is perceived to be high then a treatment is made, if it is low then nothing is done. The comparison of leafhopper counts in sprayed vs. non-sprayed vineyards clearly indicated that the perception of risk varied among growers and PCAs. Furthermore, it demonstrated the value of using quantitative data to compare the actions taken by different growers because without it comparisons would not be possible. These comparisons help BIFS growers and PCAs separate perceived risk from real risk so they can make better pest management decisions.

### **Program Outcomes**

The LWWC BIFS program has had a number of significant outcomes over the past 10 years. The examples described above show that it has had a significant impact on the pest management practices of many Lodi winegrape growers. Moreover, as a result of the ongoing demonstration on BIFS vineyards and the accompanying grower outreach over the last decade, LWWC growers have reduced the environmental impact of their pesticide use to be roughly equivalent to that of certified organic vineyards. This outcome is supported by results of LWWC's Pesticide Environmental Assessment System (PEAS), which models environmental impacts of pesticides, either synthetic or organic, in vineyards. (For more information on the LWWC PEAS model visit [http://www.lodiwine.com/lodirules\\_peas1.shtml](http://www.lodiwine.com/lodirules_peas1.shtml))

LWWC's BIFS program has also influenced programs outside of the Lodi Region. For example, as mentioned above, the program emphasized the importance of timely, systematic and quantitatively-based pest monitoring. It also emphasized tracking other important vineyard activities so that the data can be used in future decision-making. An important aspect of sustainable winegrowing is measuring what is going on in the vineyard because "if you can't measure it you can't manage it". The BIFS database system was developed to not only make collecting, storing and retrieving vineyard data easier, but to also demonstrate to growers and PCAs that databases are a valuable farm management tool. The BIFS database has been a feature of program outreach both inside and outside of Lodi. Two of the people that became familiar with the BIFS database and recognized its significance have gone on to form private companies that have created vineyard database software that is now commercially available for growers and PCAs<sup>3</sup>.

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<sup>3</sup> The LWWC BIFS program influenced the development of farm management database software by two companies who sell software designed for winegrape growers: SureHarvest ([www.sureharvest.com](http://www.sureharvest.com)) and Premiere Viticulture ([www.premierevit.com](http://www.premierevit.com)).

Perhaps one of the most important outcomes of LWWC's BIFS program is that it provided the foundation from which two very important programs evolved; the *Lodi Winegrower's Workbook* and *The Lodi Rules for Sustainable Winegrowing* certification program.

### *The Lodi Winegrower's Workbook Program*

One of the limitations of LWWC's BIFS program is that it was necessary to limit the number of grower cooperators because of LWWC staff limitations. It is very time intensive to work one-on-one with growers, but it is probably the most effective way to conduct educational outreach of sustainable farming practices. LWWC staff in consultation with the BIFS management committee recognized the need to develop an outreach tool that could be used to work one-on-one, but in a way that could involve many more growers. After extensive research into what other groups have done to meet the educational outreach challenge in relation to sustainable farming it was decided to write a self-assessment workbook modeled after the ones developed by the Farm\*A\*Syst program<sup>4</sup>. In 1999, the year after the UC SAREP BIFS grant funding ended, LWWC staff led a large committee of growers, PCAs, University of California scientists and Farm Advisors, a wildlife biologist from East Bay Municipal Utility District in writing what would become the *Lodi Winegrower's Workbook: A self assessment of integrated vineyard practices*<sup>5</sup>. Using the workbook a winegrape grower can identify the good things they are doing on their farms, identify the environmental concerns in their farming operations, and create a plan of action and timetable to address those concerns. The workbook addresses all aspects of farming with chapters on viticulture, soil management, water management, habitat, human resources and wine quality.

The workbook was published in early 2000 and following the Neighborhood Grower Meeting model developed in the first year of the BIFS program, LWWC held over 35 workbook workshops at grower's houses over the next eighteen months. Approximately 250 growers were introduced to the workbook and used it for a self-assessment of their farming practices. The growers shared their assessments with LWWC staff for inclusion in a database. The database provides data summaries that are used to benchmark the level of sustainability for the Lodi winegrape region.

The *Lodi Winegrower's Workbook* has been used as a model to create a self-assessment workbook for the California wine industry.<sup>6</sup> The Lodi workbook model has also stimulated other wine regions, such as Washington and Long Island in New York, to create self-assessment workbooks<sup>7</sup>.

### *The Lodi Rules Program*

One very important component of sustainable farming is economic viability. As with many other agricultural crops in California, Lodi winegrape growers are facing fierce competition from the rest of the global marketplace. As a result of all their hard work and lessons learned in the

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<sup>4</sup> <http://www.uwex.edu/farmasyst/>

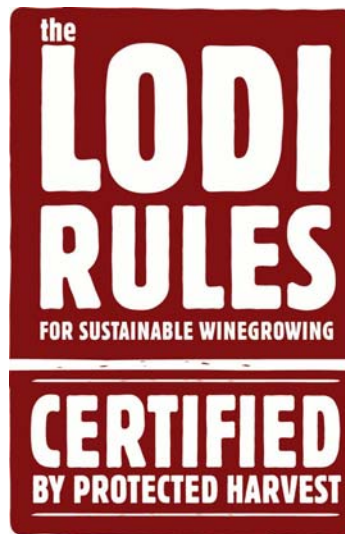
<sup>5</sup> <http://www.lodiworkbook.com/>

<sup>6</sup> *The Code of Sustainable Winegrowing Practices Self-Assessment Workbook* [www.sustainablewinegrowing.org](http://www.sustainablewinegrowing.org).

<sup>7</sup> <http://www.vinewise.org>

BIFS and workbook programs, Lodi growers felt they could add value to their winegrapes and wines by marketing them as being produced using sustainable farming practices.

In 2002, when LWWC's BIFS program was in its 7<sup>th</sup> year and Lodi winegrape growers had been using the workbook for 2 years, a committee of growers and PCAs formed to survey the various eco-label programs developed inside and outside the US. The committee concluded that the model used by Protected Harvest<sup>8</sup>, a non-profit organization that independently certifies sustainable farming practices, best suited the needs of LWWC. In 2004 a stakeholder committee was formed to develop a set of sustainable winegrowing standards; Dr. Chuck Benbrook was hired to develop a pesticide impact model, the Pesticide Environmental Assessment System (PEAS), that assesses the environmental impact of each pesticide registered for use in Lodi vineyards. At the same time, a market research team was assembled to survey all segments of the wine industry and wine consumers as to how they would react to an eco-labeled wine. Based on the results of their market research the program was named *The Lodi Rules for Sustainable Winegrowing* (Fig. 6).



**Figure 6. Logo for LWWC's eco-labeling program.**

At the end of 2004, the farming standards and pesticide impact model was submitted to Protected Harvest for peer review and endorsement. A certification system was put in place and the program was launched in 2005. Six growers certified 1455 acres of vineyards in the inaugural year and in 2006 twelve growers certified 6000 acres of vineyards. In July of 2006 the US Alcohol and Tobacco Tax and Trade Bureau approved the first Lodi wine label to bear the *Lodi Rules* logo (Fig. 7).

*The Lodi Rules for Sustainable Winegrowing* program<sup>9</sup> is California's first third party-certified sustainable winegrowing program. The experience with and data from the BIFS program as well as the self-assessment system in the *Lodi Winegrower's Workbook* provided the foundation for the *Lodi Rules* program.

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<sup>8</sup> [www.protectedharvest.org](http://www.protectedharvest.org)

<sup>9</sup> <http://www.lodirules.com>.



**Figure 7. The first federally approved *Lodi Rules* wine label.**

### **Lessons Learned**

In summary, there are a number of lessons learned from LWWC's BIFS program. Most significantly, LWWC shows that the BIFS model works. In our case, the BIFS grant provided seed money to initiate a program that has been able to continue on into the future. Moreover the idea that a core group of growers can then transfer what they have learned to a large community of growers is a valid one. Finally, it corroborates what Pence<sup>1</sup> observed - that growers are the foundation of the program and their experience on the farm is a valuable addition to the body of knowledge that moves agriculture forward. Growers and PCAs are recognized as equal partners in the quest for better ways to grow crops in a more sustainable way. The BIFS model's team approach to agricultural project management with all the stakeholders, such as growers, PCAs, University personnel, commodity processors, and community members being a part of the team is very powerful.