2001 Report to the Legislature

RECOMMENDATIONS FOR RICE STRAW SUPPLY

March 2001

S T A T E O F C A L I F O R N I A

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ACKNOWLEDGEMENTS

This report was written under the direction of the Executive Officer of the California Air Resources Board (ARB), in consultation with the California Department of Food and Agriculture (CDFA), and in cooperation with the California Energy Commission (CEC) and the California Integrated Waste Management Board (CIWMB). The staff of the ARB's Planning and Technical Support Division prepared the report with assistance from the Research Division.

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This draft report has been reviewed by the staffs of the ARB and the CDFA and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the ARB or CDFA.

Recommendations
for
Rice Straw Supply

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Dear Mssrs. Schmidt and Wilson:

This report responds to the Legislature's requirement to provide recommendations for ensuring consistency and predictability in the supply of rice straw for cost-effective uses. Health and Safety Code section 41865.5 requires the Air Resources Board (ARB or Board) to prepare these recommendations after consultation with the California Department of Food and Agriculture and in cooperation with the State Energy Resources Conservation and Development Commission and the California Integrated Waste Management Board. The recommendations in this report were based on input from rice growers, rice straw experts in the harvesting, baling, storage and transportation industries, University of California researchers, farm advisors, and air district staff in the Sacramento Valley Air Basin during an extended public process.

Subsequent to preparation of the report, the economic circumstances of the State of California have changed. We recognize that the Legislature will need to consider the current budget shortfall in reviewing the recommendations contained in the report.

Sincerely,

/s/

Alan C. Lloyd, Ph.D.
Chairman

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: http://www.arb.ca.gov.

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Summary and Recommendations

The development of cost-effective uses for rice straw continues to be a challenging and key element of the overall program to reduce the amount of rice straw burned in the Sacramento Valley. To support the further development of these uses, the California Legislature directed the Air Resources Board (ARB) to "prepare and submit to the Legislature recommendations for ensuring consistency and predictability in the supply of rice straw for cost-effective uses, including, but not limited to, recommendations for methods of harvesting, storing, and distributing rice straw for off-field uses."[1] This report presents the ARB's recommendations. The ARB developed this report in consultation with the California Department of Food and Agriculture (CDFA), and in cooperation with the California Energy Commission (CEC) and the California Integrated Waste Management Board (CIWMB). Additionally, the ARB has solicited input from key stakeholders in the Sacramento Valley.

Over 500,000 acres of rice are planted annually in California, resulting in approximately 1.1 million dry tons of rice straw that must be managed each year. Beginning in 2001, the phase-down of rice straw burning limits acreage burned to 25 percent of the total acres planted or 125,000 acres, whichever is less. However, this burning can occur only for disease control purposes. Growers unable to use this disposal method must either incorporate the remaining rice straw back into the field or remove it completely. The goal for off-field use is approximately 50 percent of the total amount of rice straw, or about 550,000 dry tons. Currently, about 50,000 tons of rice straw are used off-field.

A number of off-field rice straw uses are currently being developed, many with the sponsorship of the Rice Straw Demonstration Project Grant Fund (Rice Fund). These uses include:

- energy alternatives such as ethanol production and biomass-to-energy conversion;
- pulp and paper products;
- fiberboard;
- bale construction;
- sound walls;
- erosion control;
- livestock feed and bedding;
- export; and,
- compost.

The average cost to harvest, store, and transport rice straw for these alternative uses is $37 per ton (see Appendix B for detail). In contrast, the cost to

[1] Senate Bill 1186, Statutes of 1999,Chapter 640, Section 1; California Health and Safety Code section 41865.5.

incorporate rice straw back into the field is approximately $16 per ton. In order to promote off-field uses of rice straw, issues associated with the cost differential between incorporation and off-field usage must be addressed. These issues in turn affect the consistency and predictability in the supply of rice straw.

Although storage facilities are adequate for current levels of off-field utilization, sufficient storage capacity does not exist to meet eventual off-field use levels of over 500,000 tons. In addition, the ability to transport increasing amounts of rice straw quickly, efficiently, and cost-effectively to end-users is questionable and would likely result in impacts on local roads and traffic unless spread out over longer time periods. The momentum created by recent industry and government efforts to utilize rice straw could be lost if steps are not taken to enhance the capabilities of the industry to provide storage and reduce potential traffic impacts for increased harvesting and utilization of straw.

The ARB's recommendations on preferred methods for harvesting, storing and transporting rice straw are presented below. Recommended actions to ensure that a consistent and predictable supply of rice straw is available to meet the future demands of off-field uses are also provided. Additional background information and supporting documentation are provided following the recommendations and in the Appendices.

Recommendations for Methods of Harvesting, Storage, and Distribution of Rice Straw

No single method of harvesting, storage, or distribution of rice straw will be optimal for every end-user. For example, methods to ensure the high quality of straw needed for export would not be cost effective for rice straw used for feedstock. The marketplace will make the ultimate decision as to the cost-effectiveness of any method of harvesting, storage, or distribution. However, research into these methods would enable the end-user to make more informed decisions and avoid costly trial and error exercises. In addition, more cost-effective methods of harvest, storage and distribution of rice straw will ultimately reduce the overall cost of rice straw for end-use.

Existing Program Recommendations

The State Legislature could consider the following actions:

- For the Rice Straw Demonstration Project Grant Fund (Rice Fund):
  - Support the Governor's proposed budget for the Fiscal Year 2001/2002 of $1 million for the Rice Fund to promote alternative uses of rice straw.
  - Increase funding to encourage continued development of alternative uses of rice straw.

- For the Rice Straw Utilization Tax Credit Program (Program):

  - Amend State Revenue and Taxation Code section 17052.10 to extend the time allocation for the Program to January 1, 2015 to increase the incentive for financial backing of off-field end-users.
  - Modify the Program to include a storage tax credit component to enable the construction of new storage facilities

Harvesting and Collection Recommendations

The State Legislature could consider the following actions:

- Allocate fiscal resources to support collaborative research for:

  - Development and demonstration of more efficient harvesting and baling equipment.

- Implement fiscal measures to offset the costs of harvesting and collecting of the rice straw. These include, but are not limited to, the following:

  - Accelerated depreciation of specialized rice straw harvesting and baling equipment; and,
  - Tax incentives to offset capital outlays for rice straw harvesting and collection equipment.

Field and atmospheric conditions, available harvesting and baling equipment, the time-frame in which to harvest, and the eventual end-use all factor into creating optimal methods of harvesting. Although present harvesting methods address the current needs of end-users, increases in end-use may require more efficient harvesting and collecting operations. In addition, increasing efficiency can decrease costs by decreasing the amount of time that equipment is on the field and the amount of labor involved in the operations. These cost savings would initially benefit the grower, harvester, and/or baler but could be passed on to the end-user, thereby encouraging the use of rice straw over other commodities. Advances in systems analysis and close collaboration with equipment manufacturers can significantly aid in this endeavor.

Storage Recommendations

The State Legislature could consider the following actions:

- Allocate fiscal resources to support collaborative research on:

  - Development of a system to monitor the condition of rice straw to determine optimal storage parameters for a variety of end-users;

- Development of methods to efficiently increase the density of straw bales to allow for decreased storage space per ton of rice straw as well as increasing the number of bales transported in one load; and,
- Development of systems to optimize placement of storage facilities to keep distribution costs and local community impacts to a minimum.

- Implement fiscal measures to offset the costs of storage. These include, but are not limited to, the following:

  - Accelerated depreciation of storage facilities; and,
  - Tax incentives to offset capital outlays for rice straw storage facilities.

Current storage methods are generally adequate for existing end-user needs. However, increasing the number of storage facilities will be necessary as the amount of rice straw used increases. The most effective method of storage for high quality straw is permanent and covered facilities, such as metal barns. In some cases, however, tarped or even uncovered straw is considered adequate storage. The ultimate end-use, and the timing of that use, will factor into the storage decision.

Storage facilities can be located on the field where the straw is harvested, at the end-user's site, or at an intermediate storage facility. The specific location is somewhat dependent upon the end-use, the end-user location, and the cost of transportation. Proper siting of facilities can increase cost-effectiveness of rice straw to the end-user and research into this component would be highly beneficial.

In addition, research is needed to develop methods for monitoring the condition of the rice straw and to determine optimal storage parameters. This will ensure that the straw maintains an appropriate quality for the desired end-use.

Transportation and Distribution Recommendations

The State Legislature could consider the following actions:

- Allocate fiscal resources to sponsor research into:

  - Development of methods to efficiently increase the density of straw bales to allow more bales to be transported at one time as well as decrease the amount of storage space necessary for each ton of rice straw;
  - Establishment of the effect of increased harvesting, baling, transporting, and storing of rice straw on local air quality, traffic, road maintenance, and public safety; and,
  - Development of a system to optimize placement of storage facilities to keep distribution costs and impacts on local roads and communities to a minimum.

- Implement fiscal measures to offset the costs of distributing and transporting rice straw. These include, but are not limited to, the following:

  - Accelerated depreciation of specialized transportation equipment and modifications to existing equipment; and,
  - Tax incentives to offset capital outlays for rice straw distribution and transportation equipment.

The existing transportation infrastructure meets the daily needs of current straw end-users. However, a significant increase in off-field use could result in a strain on the transportation and distribution infrastructure, increasing costs that would be passed on to the end-user. Since the cost of transporting rice straw depends on the number of times the straw is loaded and unloaded and the distance traveled, transportation issues are closely bound with storage issues. Careful placement of storage facilities can help alleviate strain in the transportation industry and decrease costs.

Background

Consistency and predictability in rice straw supply is dependent upon adequate methods for harvesting, storage, and transportation of rice straw. This infrastructure is, in turn, dependent upon a defined need and a reasonable cost-effectiveness for end-uses.

To avoid the high costs of incorporation and the potential for increased disease incidence that this can entail, some growers, as noted in a recent study conducted by the University of California, Davis[2,3], may be willing to subsidize the harvesting, storage, and transportation of rice straw. This informal subsidy by the grower could be combined with the Rice Straw Utilization Tax Credit Program (see Appendix C for further detail), established by SB 38[4] (Appendix D), or the Agricultural Biomass Utilization Account (see Appendix E) recently enacted by AB 2514[5]. If all potential subsidies were used, an end-user could receive straw for low or no cost.

These funds are of great help to existing end-users and are sufficient for the current levels of rice straw usage. However, these programs will not be able to respond adequately to any great increase in rice straw utilization. As an example, the planned BCI-Gridley ethanol plant, due to go on-line in 2003, could completely tap out both State subsidy programs in a single year. The curtailment of the Rice Straw Utilization Tax Credit Program, currently set for 2008, could be extended to 2015, allowing more incentive for financial backing for rice straw end-use.

In addition, these programs do not address the increasing need for permanent storage for the rice straw. Although the funds from these programs can be used to offset storage costs, there are few actual facilities where the straw can be placed.

Given the presence of the existing programs, the ARB, in consultation with CDFA and in cooperation with CEC and CIWMB, has evaluated the major obstacles to the supply of rice straw for off-field use and has prepared recommendations to help ensure the consistency and predictability of rice straw availability as it relates to harvesting, storage, and transportation.

In preparing this report, the staff of ARB reviewed the current information on the topics of harvest, collection, storage, and transportation of rice straw. Staff worked closely with numerous stakeholders and two public workshops were held

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[2] Bakker-Dhaliwal, R., Bernheim, L.G., Summers, M.D., Yan, L., Jenkins, B.M. and H. Lee (1999). Rice Straw Harvesting and Handling for Off-Field Utilization. 2nd Annual Report, United States Department of Agriculture, Washington, D.C.
[3] Jenkins, B.M., Bakker-Dhaliwal, R., Summers, M.D., Bernheim, L.G., Lee, H., Huisman, W. and L. Yan (2000). Equipment Performance, Costs and Constraints in the Commercial Harvesting of Rice Straw for Industrial Applications. 2000 ASAE Annual International Meeting, Milwaukee, Wisconsin, July 9-12, 2000.
[4] Senate Bill 38, Statutes of 1996, Chapter 954, State Revenue and Taxation Code section 17052.10.
[5] Assembly Bill 2514, Statutes of 2000, Chapter 1017, California Health and Safety Code sections 39760 to 39763.

to further solicit input for this report. The first was held on August 30, 2000 in Colusa and the second was held on March 7, 2001 in Yuba City.

Many comments received during the public workshops involved the development of alternative uses of rice straw. These included increasing the incentive for rice straw as a feedstock for ethanol production and the use of agricultural byproducts by State agencies. These issues, although important, are beyond the scope of this report and will be addressed in the biennial report to the Legislature on the progress of the phase-down of rice straw burning in the Sacramento Valley.

Other comments were received during the public workshops and in the 15-day comment period established for the preliminary draft of this report. These comments are incorporated in the appropriate sections of this report.

Harvest and Collection

Available methods to harvest and collect rice straw in the Sacramento Valley sufficiently address the current needs of end-users. Although improvements are continually being made to increase the amount of rice straw harvested from each field, and the efficiency of harvesting operations increases each season, this is not a major factor in rice straw supply for end-users. Currently, only about 50,000 tons of rice straw are harvested for off-field use. In 1999, the Rice Straw Utilization Tax Credit Program (Program) certified almost 26,000 tons of straw as being qualified for a tax credit. Although this is the maximum amount of straw that the Program can certify, it is far short of the potential 1.1 million tons that could be harvested and utilized using current equipment and harvesting methods.

Although increasing straw yield may not be a concern for quite some time, increasing the efficiency and speed of harvesting operations could decrease the cost of harvesting the straw. Improvements in harvesting methods could then increase the attractiveness of rice straw as a commodity. The University of California at Davis is conducting research into the economics of various methods of rice straw harvesting and handling for off-field use[6] and note that a 50% matching grant for capital equipment costs would result in a 25% reduction in harvesting costs for equipment with a 6-year life. This could result in decreased harvesting costs by $2.50 to $5.50 per ton[7]. Matching grants could be provided through the Rice Fund and ARB staff will be considering this for the 2001-2002 grant process, provided funds are allocated in the Governor's budget. The tax incentives recommended at the beginning of this section would also act to decrease costs to growers, harvesters, balers, and end-users.

[6] Bakker-Dhaliwal, op. cit.
[7] Personal Communication, February 7, 2000

Storage

Current storage facilities are generally adequate for existing end-user needs. Several storage- and supply-related issues, however, need to be addressed if levels of usage are to increase. These issues include:

- maintaining a consistently high straw quality;
- establishing a predictable, year-round supply; and,
- lowering of storage and straw costs.

Many end-users require rice straw of high quality. This is considered to be clean straw with a controlled, low-moisture content. Rice straw deteriorates quickly without proper storage. The nominal storage practice of placing a tarp on the stacked bales of hay is considered inadequate for many uses. Industry estimates are that straw that is tarped sustains a 15-20% loss. Profit margins for companies, particularly those just starting out, are quite narrow and a 15-20% loss of raw material may prevent companies from utilizing or storing rice straw. Research that monitors the effect of various storage regimes on the quality of the straw will aid end-users in calculating storage and transportation needs for specific uses.

The University of California at Davis is conducting research into the various impacts of different storage alternatives. Their research indicates the cost to construct a barn is approximately $50 per ton of rice straw. This is based on the average cost of a 2,000-ton capacity metal barn. A total of $27,500,000 in initial storage costs would therefore be necessary to support the goal of an alternative use of 550,000 tons of rice straw per year. This assumes that there is no holdover of rice straw from year to year. Annual costs of storage average $9.50 per ton or $5.2 million. Financial support will help promote the development of the storage infrastructure.

In addition to maintaining a high quality, rice straw needs to be consistently available to the end-user. The straw is harvested primarily during the fall, before the winter rains begin in the Sacramento Valley. Due to the seasonality of the harvest, the straw must be stored in way to be available on a regular, year-round basis to the end-user. Storage can be either on the field where the straw was harvested, at the end-user's site, or at an intermediate storage facility.

End-users not guaranteed a raw material that meets their needs may look to other materials or other markets. This is particularly true of the biomass energy industry, which utilizes a variety of commodities, and the export industry, which may find the rice straw it needs from other areas of the United States or the world. The lack of permanent, covered, storage facilities for rice straw was a major topic of discussion at both public workshops. Participants felt that this lack of storage facilities was a major deterrent to meeting the requirements of clean, controlled moisture-content straw. Several efforts, however, are underway to find

ways to provide rice straw of sufficient high quality for the majority of end-users. Two of these efforts, those of the Rice Straw Cooperative[8] and Kuhn Hay[9], are current recipients of grants from the Rice Straw Demonstration Project Grant Fund (Rice Fund).

The issues noted above can be further addressed with the construction of permanent, covered storage facilities. The costs of permanent storage facilities are considerable.

- The cost of building a single barn, holding almost 2000 tons of rice straw, would range from $82,000 to $130,000 (averaging $50 per ton of straw).

- A medium-sized end-user, using 50,000 tons of straw, would require 26 pole or metal barns for storage purposes.

One way to aid in construction would be utilization of a matching grant program, such as the Rice Fund. This program could administer 50 percent matching grants and, utilizing a budget of $1 million, could provide sufficient funds to build 15 to 25 pole or metal barns with a holding capacity of 28,000 to 46,000 tons of baled rice straw.

If this budget were made available each year for five years (a total of $5 million), a gradual increase in the storage capacity in the Sacramento Valley could be achieved. By the year 2005, an additional 140,000 to 230,000 tons of rice straw could be placed in permanent storage. A matching (50 percent) grant program for constructing a metal storage building would result in a 45% reduction in storage costs for the 15-year life of the structure[10].

The tax incentives recommended at the beginning of this report would also act to decrease storage construction costs to growers and end-users.

Although the 140,000 to 230,000 tons of rice straw noted above is only a quarter to a half of the storage needed should all of the projects currently sponsored by the Rice Fund come to fruition, this jump-start could give the private sector additional incentive in the investment of rice straw as a commodity. In addition, not all of the rice straw will need to be stored in metal barns or even tarped, depending on how quickly it is used and its required quality. However, by aiding growers and end-users with building of storage facilities, the cost of rice straw to the end-user should decrease, increasing its attractiveness to those end-users that have a choice in their raw materials.

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[8] The Rice Straw Cooperative was awarded a 50% matching grant of $380,000 in May 2000. This project will evaluate the degradation of stored rice straw and its effectiveness in the manufacture of ethanol. It also aids in the baling, storage and delivery of 18,000 tons of rice straw for the start-up of the BCI Gridley Ethanol Project by the September 2002 project start-up date.

[9] Kuhn Hay was awarded a 50% matching grant of $402,311 in May 2000. This project will pursue the development of the Japanese rice straw export market, including the development of a collection, treatment and distribution infrastructure.

[10] Personal Communication, February 7, 2001

Other funding mechanisms could be utilized to aid in establishing appropriate cost-effective storage for rice straw. These include business and personal tax credits, property tax exemptions, low-interest loan programs, and accelerated depreciation of storage facilities. Modification of the Rice Straw Utilization Tax Credit Program to include storage facilities could also boost the infrastructure and decrease costs to end-users.

The use of rice straw supply cooperatives could aid in the consistency and predictability of rice straw supply for end-users. Cooperatives, such as the Rice Straw Cooperative, a Rice Fund recipient, could contract with both growers and end-users, ensuring growers of a market for their straw, and end-users with a consistent supply. The use of intermediate storage facilities could be utilized by these straw supply cooperatives, although this could add to the transportation costs as discussed below.

Participants in the March workshop discussed the establishment of a low-interest loan program for rice straw, similar to the commodity loan program utilized by the rice grain industry. This program would give growers a guaranteed outlet for their straw and end-users would be ensured of a predictable supply. Straw supply cooperatives would be ideal to advance the concept.

Transportation

An increase in the amount of rice straw being harvested, baled, and stored will require a corresponding increase in the transportation infrastructure. This can be mitigated, to some extent, by utilizing storage facilities on the grower's fields. While this would entail eventual transportation from the field to the end-user site, it would not be as time- and equipment- intensive. An additional benefit to grower-sited storage is decreased handling of the straw. Participants in the ARB's August 2000 and March 2001 rice straw supply workshops noted that paying to transport the straw twice – once to an intermediate facility and from there to the end-user – increases the cost of the straw to the end-user. There will be end-users that will prefer to maintain their own separate storage facilities, which can also cut transportation costs. The tax incentives recommended at the beginning of this report would also act to decrease costs to growers, distributors, and end-users.

While the siting of the straw storage facility is a critical issue in dealing with transportation costs, increasing load size can also reduce costs. This can be accomplished by increasing truck length or increasing bale density.

Although increasing truck length will increase efficiency of transporting rice straw by allowing more bales to be hauled at a time, there are a number of other issues associated with increasing the length of trucks used to haul rice straw. These include, but are not limited to:

- uniformity with other state and federal regulations;
- safety;
- impacts on the local roads and communities; and,
- impacts on the local baling/hauling industry.

AB 1489[11] amended the California Vehicle Code and allowed a front extension on the first trailer and a back extension on the last trailer in a combination of trailers used for hauling straw. The front extension, however, is not allowed on national network roads.

Some of these issues are currently being addressed on both the State and federal levels. We are confident that the market will drive this issue but we will continue to monitor these efforts and will address the issues should it become necessary.

Taking into account the layout of State roads versus federal roads when locating facilities could facilitate use of extensions and ease transportation expenses. Research into GIS modeling and systems network analysis of rice straw handling could optimize placement of storage facilities, easing storage and transportation costs.

Research into increasing the density of rice straw bales has also been proposed. This research could result in both decreased storage and transportation costs. Increasing bale density would increase the amount of straw that could be transported, currently limited by the size of the bales, as well as the amount stored in existing facilities.

[11] Assembly Bill 1489, Statutes of 1999, Chapter 181, California Vehicle Code section 35402.

APPENDIX A - SENATE BILL 1186

BILL NUMBER: SB 1186 CHAPTERED

CHAPTER 640
FILED WITH SECRETARY OF STATE OCTOBER 10, 1999
APPROVED BY GOVERNOR OCTOBER 5, 1999
PASSED THE SENATE SEPTEMBER 10, 1999
PASSED THE ASSEMBLY SEPTEMBER 8, 1999
AMENDED IN ASSEMBLY SEPTEMBER 3, 1999
AMENDED IN ASSEMBLY AUGUST 23, 1999

INTRODUCED BY Senator Ortiz
(Coauthor: Assembly Member Steinberg)

FEBRUARY 26, 1999

An act to add Section 41865.5 to the Health and Safety Code, relating to air quality, and making an appropriation therefor.

LEGISLATIVE COUNSEL'S DIGEST

SB 1186, Ortiz. Rice straw.

(1) Existing law, the Connelly-Areias-Chandler Rice Straw Burning Reduction Act, among other things, required the State Air Resources Board and the Department of Consumer Affairs, on or before September 1, 1992, to establish an advisory committee to develop a list of priority goals for the development of alternative uses of rice straw for the purpose of developing feasible and cost-effective alternatives to rice straw burning.

This bill would require the State Air Resources Board, in consultation with the Department of Food and Agriculture, on or before January 1, 2001, and in cooperation with specified others, to prepare and submit to the Legislature recommendations for ensuring consistency and predictability in the supply of rice straw for cost-effective uses, as provided.

(2) This bill would provide that specified funds appropriated pursuant to the Budget Act of 1998 to the state board for purposes of developing rice straw demonstration projects, which were not encumbered or otherwise expended during the 1998 fiscal year, shall be available for encumbrance by the state board during the 1999-2000 fiscal year for purposes of the rice straw demonstration project.

Appropriation: yes.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 41865.5 is added to the Health and Safety Code, to read: 41865.5. Notwithstanding Section 7550.5 of the Government Code, on or before January 1, 2001, the State Air Resources Board, in consultation with the Department of Food and Agriculture, and in cooperation with the State Energy Resources Conservation and Development Commission and the California Integrated Waste Management Board, shall prepare and submit to the Legislature recommendations for ensuring consistency and predictability in the supply of rice straw for cost-effective uses, including, but not limited to, recommendations for methods of harvesting, storing, and distributing rice straw for off-field uses. Off-field uses may include, but are not limited to, the production of energy and fuels, construction materials, pulp and paper, and livestock feed.

SEC. 2. Notwithstanding subdivision (a) of Section 2.00 of the Budget Act of 1998 (Ch. 324, Stats. 1998) or any other provision of law, the funds appropriated for support of the State Air Resources Board pursuant to Item 3900-001-0489 of Section 2.00 of the Budget Act of 1998 that were not encumbered or otherwise expended during the 1998-99 fiscal year shall be available for encumbrance by the state board during the 1999-2000 fiscal year for purposes of the rice straw demonstration project established by Chapter 4.5 (commencing with Section 39750) of Part 2 of Division 26 of the Health and Safety Code.

APPENDIX B - RICE STRAW HARVESTING, STORAGE, AND TRANSPORTATION

Much of the increased growth in straw usage will depend on the availability and price of the straw. Costs of harvesting, transporting, and storage, as outlined in Table B-1, will determine much of the straw price. Not all end-users will be subject to all of these costs. The average cost is $37 per dry ton.

Table B-1

Cost Summary[12] ($/ton)			
	Low	**High**	**Average**
Small Bales			
Harvesting and Roadsiding	$14	$34	$22
Transportation (incl. loading/unloading)	$8	$17	$12
Storage	$6	$33	$12
Total	$28	$86	$46
Large Bales			
Harvesting and Roadsiding	$6	$20	$10
Transportation (incl. loading/unloading)	$7	$16	$11
Storage	$4	$13	$7
Total	$17	$49	$28

Harvesting

Harvesting methods are currently adequate to meet the needs of both growers and end-users. Increases in the harvesting and baling workload due to increases in end-user demand can be met in the short-term through the use of equipment and personnel from other states, such as Oregon, which has a well-established harvesting infrastructure. The local harvesting and baling industry will respond to market conditions and grow to meet any long-term demands.

Currently, it costs the grower more to harvest and bale the straw than it does to incorporate it back into the soil[13]. However, these costs can be offset when the baled straw is sold. The increased control of weeds and diseases associated with harvesting and baling may also make it a slightly more attractive alternative to the grower[14]. As noted in the 1998 *Rice Straw Diversion Plan*[15], the cost of some rice straw to end-users is subsidized by growers who do not expect to make a profit on the straw, but to be "cost-neutral". End-users pay from $18 to

[12] These estimates were based on information in Tables B-2, B-4 and B-6 and information from Fife and Miller (1999) and Jenkins, et.al. (2000).
[13] Blank, S.C., Jetter, K., Wick, C.M. and J.F. Williams (1993). Incorporating rice straw into soil may become disposal option for growers. *California Agriculture* **47**:8-12.
[14] Bakker-Dhaliwal, R., et.al., (1999)
[15] Air Resources Board (1998). Rice Straw Diversion Plan. Sacramento, CA.

$35 per ton for baled rice straw[16]. These costs can be compensated by the use of the Rice Straw Utilization Tax Credit Program administered by the California Department of Food and Agriculture (CDFA). Recent legislation[17] establishing the Agricultural Biomass Utilization Account (Account) could also compensate end-user costs, particularly for those with little or no California income tax liability, with a $20 per ton grant. This Account, also administered by the CDFA, is limited to a total of 100,000 tons of straw.

As noted in Table B-2, rice straw harvesting costs range from $6 to $33 per ton, depending on the size of the bale being harvested. Smaller bales cost approximately twice that of large bales to harvest, bale and roadside. The average cost per ton is approximately $10 for large bales and $22 for small bales. Administrative costs, as well as storage and transportation costs, are not included in these amounts. These harvesting costs are comparable to other industry estimates[18,19,20] of $17 to $26 per ton and make baling of the straw competitive with incorporation as an alternative to burning as long as an end-user can be found.

Storage

Types of Available Storage

Roadsiding

The most common and least expensive method of storage is the stacking of the baled straw by the side of the road (also called road-siding) or at some other location. This is a practical option for the grower but wet weather can greatly contribute to the deterioration of the straw. Unsecured stacks are subject to arson, and any stacks are subject to spontaneous combustion if bales are put up at too high a moisture content (the risk increases as moisture content within the stack exceeds 14% wet basis). Stacks that have been exposed to rain will therefore run some risk of spontaneous ignition. Road-siding is deemed the best alternative for those end-users who have close to immediate need for the straw or who do not mind the lower quality that develops with increasing time in storage.

[16] Jenkins, op. cit.
[17] A.B. 2514, op. cit.
[18] Fife, L. and W. Miller (1999). Rice Straw Feedstock Supply Study for Colusa County, California. A report prepared by the Rice Straw Feedstock Joint Venture for the Western Regional Biomass Energy Program, September 1999. [http://www.westbioenergy.org/biopub.htm, July 2000.]
[19] Moss, S., Mitchell, D., McCann, R. and T. Bayh (1993). The Economic Impacts of Alternatives to Open-Field Burning of Agricultural Residues. Final Report, Foster Associates, Inc., San Francisco, California for the California Air Resources Board, Sacramento, California.
[20] March 7, 2001 ARB Workshop

Table B-2

Harvesting Costs[21] ($/acre)					
	Raking	**Swathing**	**Baling**	**Roadsiding**	**Total[22]**
Small Bales					
Low	$1.66	$7.58	$5.67	$9.41	$19.01
High	$5.04	$11.36	$20.95	$26.71	$46.37
Average	$3.16	$9.13	$ 9.95	$16.92	$33.01
StDev	$1.53	$1.60	$5.25	$5.06	$9.59
Large Bales					
Low	$1.15	$5.70	$4.02	$1.75	$11.57
High	$4.02	$18.05	$24.33	$25.55	$38.74
Average	$2.11	$12.49	$10.99	$5.46	$22.45
StDev	$0.99	$4.48	$4.76	$5.32	$9.57
($/ton)					
	Raking	**Swathing**	**Baling**	**Roadsiding**	**Total[23]**
Small Bales					
Low	$1.21	$5.92	$3.61	$6.56	$13.73
High	$3.05	$8.01	$13.20	$14.39	$33.46
Average	$1.83	$7.25	$6.41	$11.13	$22.07
StDev	$0.72	$0.93	$2.88	$2.81	$6.18
Large Bales					
Low	$0.48	$3.15	$2.52	$1.35	$5.86
High	$4.13	$8.93	$13.45	$16.06	$19.48
Average	$1.33	$4.78	$4.28	$3.08	$9.99
StDev	$1.04	$1.74	$2.14	$2.87	$3.84

Tarping

The second most common storage solution is tarping. Tarps can cover just the tops or the tops and sides of the bale stack, or they can completely encase the bales. The bales are generally placed on a surface or pad that raises them above ground level and away from surface moisture. Growers, however, report that there can be a 15-20% loss of straw if it is allowed to sit for several months in this manner. Water can wick into the lower bales and they generally have to be discarded. The initial low cost of the tarping is offset by this loss and by the deterioration of the remaining straw, making it unsuitable for some users. Tarps are also subject to fairly rapid deterioration as a result of exposure to ultraviolet

[21] Adapted from Jenkins, et.al. (2000).
[22] Total costs are for complete systems (raking, baling, roadsiding or swathing, baling, roadsiding) so costs for individual operations may not total to cost for complete system.
[23] ibid.

radiation from the sun (depending on material) and lofting and tearing in high winds. This is the method, however, currently being used by end-users that require higher quality straw, such as fiberboard manufacturing, because of the lack of more permanent facilities.

Ensiling

Ensiling, the storage of a green crop in a silo or covered with plastic, is a nominal storage alternative that for some end-uses. This straw, although not stored under dry conditions, is still useful for animal feed and possibly some fermentation systems. Although silos are currently available, the rice straw could end up displacing other commodities, thereby shifting but not solving, the storage problem. A more economical alternative, piling the straw and covering it with heavy-gauge plastic, is similar, if not identical in some cases, to tarping.

Permanent Structures

Few permanent facilities, either pole barns or metal barns, are available in California for storing rice straw. These are the most expensive storage options in terms of capital costs, though not necessarily cost per unit material stored, and generally require an assurance of user demand before growers will invest in the infrastructure. However, they do provide the most effective protection and best maintain the quality of the straw.

Storage Needs and Costs

The Western Regional Biomass Energy Program recently completed a study, *Rice Straw Feedstock Supply Study for Colusa County California*[24] that addressed many storage issues. The study estimated that in general, 0.05 tons of small-baled straw stacks or 0.15 tons of large-baled stacks require one square foot of storage space. Small stacks measured approximately 10x10x40 feet and weighed 19 tons. Large stacks measured 28x28x56 feet and weighed 233 tons. Taking space needs for access and handling of the straw into account reduced the space estimates to 0.02 tons per square foot for small-baled stacks and 0.07 tons for large-baled stacks. Converting square footage to acres implies that each acre of storage can hold 871 tons of small-bale stacks or 3049 tons of large bales.

Studies done at the University of California at Davis[25] estimate land area requirements to range from 2044 to 5725 tons of straw stored per acre, depending on the bale size. Using the Feedstock Supply Study data, Table B-2 shows that if all reasonably available rice straw (562,500 tons) were utilized, the annual storage space needed would range from 184 to 904 acres including a 40% annual carryover in the latter case.

[24] Fife and Miller, op. cit.
[25] Jenkins, op. cit.

Storage needs (noted in Table B-3) based on the current estimate of 32,000 tons of straw being utilized, range from 10 to 51 acres. The low estimate for the year 2005, which assumes that all the Rice Fund recipients would meet their minimum estimated rice straw needs of 407,000 tons, shows that storage needs will range from 133 to 654 acres. This range will also depend on whether the end-user wishes to "carry over" a percentage of the straw from year-to-year to increase stability of supply. The amount of storage space needed could be costly for growers, who may have to give up valuable crop growing acreage, although this is approximately one-tenth of one percent of available land.

Table B-4 shows a sampling of rice straw storage costs. These costs assume a 15-50% salvage cost of the infrastructure for storage of 22,000 tons of rice straw.

A medium- to high-level end-user (22,000 - 110,000 tons a year), will need to invest between approximately $4 and $32 per ton annually in storage. An economy of scale exists up to about 5,000 tons in storage, but diminishes beyond this due to limited stack sizes for insurance reasons and consequent increases in the number of storage facilities required.

Table B-3

Rice Straw Storage Needs[26]
(in acres)

	Individual End-User Usage Levels (tons)			**Total Usage Levels (tons)**		
	Low (10,000)	Medium (50,000)	High (100,000)	Current (32,000)	Low Estimate Year 2005 (407,000)	Capacity (562,500)
No carryover	*Acres Needed*			*Acres Needed*		
small bales	11	57	115	37	467	646
large bales	3	16	33	10	133	184
20% carryover						
small bales	14	69	138	44	561	775
large bales	4	20	39	13	160	221
40% carryover						
small bales	16	80	161	51	654	904
large bales	5	23	46	15	187	258

[26] Fife and Miller, op. cit.

Table B-4

Rice Straw Storage Costs[27] (for 22,000 tons[28])				
	per ton		per acre	
	large bale	small bale	large bale	small bale
Uncovered, top and sides lost	$10.96	$6.16	$33,428	$5,368
Tarped, by grower, 10% loss	$4.20	$7.25	$12,805	$6,310
Pole Barn, 15% salvage value	$4.21	$10.06	$12,833	$8,765
Metal Barn, clear span, 50% salvage value	$3.84	$7.05	$11,697	$6,144
Metal Barn, center pole, 50% salvage value	$3.45	$6.64	$10,532	$5,780
Fabric building, 25% salvage value	$13.35	$32.78	$40,718	$28,552

Transportation

Transportation costs can be broken down into road-siding, loading and unloading, and transporting costs. Road-siding cost estimates range from $6 to $17 per ton of straw and loading and unloading from $1.20 to $1.60 per ton. Industry estimates are similar, with loader expenses running a little higher at $2.45 per ton[29].

As detailed in Table B-5, 1600 truckloads of straw would be utilized during the fall harvest period. This is based on an approximate current usage of

- 32,000 tons of rice straw
- 20 tons of straw per truckload, and a
- 20 to 60 day straw harvest window.

This amounts to three to eight truckloads per hour at 10 hours per day and is within the capacity of the current transportation industry.

[27] Jenkins, op. cit.
[28] Straw value of $22.72/ton when stored on a gravel pad.
[29] March 2001 Workshop, op. cit.

Table B-5

Required Rice Straw Transport[30] (in Truckloads)										
Straw (tons)	Total Truckloads		per day				per hour (10 hrs/day)			
	Truck payload (tonnage)									
	15	20	15		20		15		20	
			Harvesting Window (days)							
			20	*60*	*20*	*60*	*20*	*60*	*20*	*60*
32,000	2133	1600	107	36	80	27	11	4	8	3
50,000	3333	2500	167	56	125	42	17	6	12	4
100,000	6667	5000	333	111	250	83	33	11	25	8
407,000	27133	20350	1357	452	1018	339	136	45	102	34
562,500	37500	28125	1875	625	1406	469	188	62	141	47

Increasing the amount of rice straw being harvested increases the number of daily truckloads needed to transport this straw off-field to the end-user. Drastically increasing truck traffic on local roads in this short period of time might have detrimental effects on local traffic, safety, and road conditions. This could eventually increase the overall cost to the end-user. Spreading out the traffic by storing the straw in the field and transporting it to the end-user as the need arises could lessen the impact on the local communities, but at the expense of increasing handling and delivery costs. This would also require storage facilities in place at the grower's or some other local site.

Stakeholders at both the August and the March workshops commented extensively on the benefit of decreasing the number of truckloads by increasing the length of the individual trucks. A maximum of seven-and-a-half large bales can be transported with a double-trailer combination. Seven bales are generally hauled over short distances. Longer distances utilize the extra half bale, but cutting the bale adds to labor and transportation costs. Stakeholders wish to increase the maximum vehicle length to allow eight full bales per load, which could then decrease transportation costs. In addition, comments were made that allowing longer vehicles would enable greater usage of balers/transporters from other states for the short, intensive harvest in the fall.

An attempt to alleviate this problem was made with the passage of Assembly Bill 1489[31]. This bill, which amended Section 35402 of the Vehicle Code, allowed an extension on the front of the first trailer and the back of the last trailer in a combination of trailers. This would allow more straw to be hauled in one truckload, decreasing the transportation costs associated with rice straw. The

[30] Fife and Miller, op. cit.
[31] A.B. 1489, op. cit.

front extension, however, is allowed only on State roads and is not allowed on federal network routes.

These issues are being studied at both the state and national levels and the ARB will continue to monitor these efforts. Uniformity in regulations can aid in increasing efficiency of handling of rice straw and utilization of available balers and haulers during the short harvest season.

Transport costs range widely based on the size of the load (15 versus 20 tons) and the distance of travel. These costs range from $7.00 per ton for a 15-ton load being transported 10 miles (or $0.70 ton/mile) from the grower's field, to $14.20 for a 20-ton truck transporting straw a distance of 100 miles (or $0.142/ton/mile). Table B-6 details some of these costs.

Table B-6

Transport Cost Ranges[32]				
Trip Distance	**Load - 15 tons (small bales)**		**Load – 20 tons (large bales)**	
miles	*$/ton*	*$/ton/mile*	*$/ton*	*$/ton/mile*
10	$ 7.00	$ 0.70	$ 6.20	$ 0.62
20	$ 8.00	$ 0.40	$ 7.20	$ 0.36
30	$ 9.20	$ 0.31	$ 8.20	$ 0.27
40	$ 10.00	$ 0.25	$ 9.20	$ 0.23
50	$ 11.00	$ 0.22	$ 10.20	$ 0.20
100	$ 14.80	$ 0.15	$ 14.20	$ 0.14

[32] Adapted from Fife and Miller (1999), Table 4.2.

APPENDIX C - RICE STRAW UTILIZATION TAX CREDIT PROGRAM

Report to the Legislature
Rice Straw Utilization Tax Credit Program
California Department of Food and Agriculture
June 1, 2000

The Rice Straw Utilization Tax Credit Program was established by SB 38 (Lockyer, Ch 954, 1996) as Section 17052.10 of the State Revenue and Taxation Code. The law provides that for each taxable year beginning on or after January 1, 1997, and before January 1, 2008, there shall be allowed as a credit against the amount of "net tax," as defined (California state income tax), the amount of $15 per ton of rice straw that is grown within California and purchased during the taxable year by the taxpayer. The taxpayer must be the "end user" of the rice straw, meaning anyone who uses the rice straw for any purpose, including but not limited to processing, generation of energy, manufacturing, export, or prevention of erosion, exclusive of open burning, that consumes the rice straw. The taxpayer cannot be related, under the Internal Revenue Code to any person who grew the rice straw within California. The law limits the aggregate amount of the tax credit to $400,000 for each calendar year. In cases where the tax credit exceeds the "net tax," the excess may be carried over to reduce the "net tax" for the next ten taxable years, or until the credit has been exhausted, which ever comes first.

Under the law, the California Department of Food and Agriculture (CDFA) must:

- certify that a taxpayer has purchased rice straw during the specified taxable year,
- issue certificates to qualified taxpayers on a first-come, first-served basis,
- provide an annual listing to the Franchise Tax Board,
- provide the taxpayer with a copy of the certification,
- obtain the taxpayer's identification number, and
- provide an annual informational report to the Legislature.

Background:
The Connelly-Areias-Chandler Rice Straw Burning Reduction Act of 1991 (AB 1378, Ch 787, 1991) mandated the phase down of open field rice straw burning by 1998. The phase down period was recently extended until 2000 (Thompson, SB 318, Ch 745, 1996) due in part to the recognition that alternative straw management options were costly and slow to develop. Furthermore, soil incorporation of straw, the only widely available management option, continues to cause adverse effects to rice farming operations including but not limited to increased costs, increased incidence of disease and weeds, and other land and irrigation management problems.

The Legislature, recognizing the need for incentives to speed the development of off-field uses of rice straw, established the tax credit as one incentive. The $400,000 annual tax credit represents 26,667 tons of rice straw, or about 9,000 to 13,000 acres. Approximately 540,000 acres of rice was planted in the Sacramento Valley in 1999, up about 20 percent from 1998.

Program Status:
Last year, 1999, was the third year of the program. Those that requested information concerning the 1997 and 1998 Program were automatically sent information for 1999. The Department received and responded to an additional 40 telephone, written and faxed inquiries.

Applications for the tax credit were accepted on a first-come, first-served basis starting on December 1, 1999 at 8:00 am at the CDFA headquarters in Sacramento. To date for the 1999 tax year 17 applications were received requesting $390,312 in tax credits for purchase of 26,021 tons of rice straw. The CDFA approved all 17 applications totaling $384,319 in tax credits for purchase of 25,621 tons of rice straw. Three applications were reduced because purchases were not adequately documented as rice straw or purchases were not made in the qualifying year. Please see Table 1.

Table 1: Program Summary

Requests	Number	Tons	Tax Credit ($)
Total	17	26,020.77	$390,311.55
Certificates Issued	17	25,621.29	$384,319.35
Denied	0	399.48	$5,992.20

Of the 17 applications approved, eight were dairies, three were manufacturing companies, four were other livestock operations and one each was an exporter and a private home builder. The primary uses of the rice straw were for particle board manufacturing, animal bedding, animal feed, erosion control and straw bale building construction. Please see Table 2 and Table 3.

Table 2: Types of Businesses

Business	Number	Tons	Tax Credit ($)
Dairy	8	1,507.62	$22,614.30
Cattle	4	2,730.5	$40,957.50
Erosion Control Mfg.	2	1,699.57	$25,493.55
Particle Board Mfg.	1	19,440	$291,600.00
Exporter	1	234	$ 3,510.00
Home Owner	1	9.6	$144.00
TOTAL	17	25,621.29	$384,319.35

Table 3: Methods of Use

Method	Number*	Tons
Animal bedding	6	1,250.33
Feed	8	3,206.79
Erosion control	3	1,714.57
Particle Board Mfg.	1	19,440.00
Straw Bale Construction	1	9.6
TOTAL	19	25,621.29

*Two certified applicants used the straw for multiple purposes (feed/bedding; bedding/erosion control). They did indicate how much went to each use.

Participation in the Rice Straw Utilization Tax Credit Program in 1998 was comparable to 1997 levels by most measures – approved applications, tonnage, and thus tax credit amount. However, the number of inquiries and number of applications submitted were down about 25 percent from the first year of the Program. There were two main factors that may account for this. First, the industry and end-users were now familiar with how the program worked. New inquiries tended to be reasonably well informed about the program and primarily wanted the most recent application form and often wanted leads as to potential sources of rice straw. Second, due to weather constraints, straw availability was limited as compared to the previous year. Thus, there may have been a supply constraint that prevented expanded participation in the Program. The CDFA received many calls inquiring as to potential sources of rice straw. Please see Table 4 for a comparison of the program for 1997 and 1998.

Table 4: Annual Comparison – 1997 and 1998

	1997	1998	1999
Applications received	35	22	17
Applications approved	28	20	17
Tonnage applied for	31,230.6	7,449.66	26,020.77
Tonnage approved	6,033.995	5,890.66	25,621.29
Tax credit applied for	$468,459	$111,744.90	$390,311.55
Tax credit approved	$90,509.34	$88,359.90	$384,319.35

The Department has prepared an annual listing of the qualified taxpayers who were issued certificates with the amount of rice straw purchased by each taxpayer. The CDFA has provided the information to the Franchise Tax Board in a computer readable form and in the manner prescribed by the Board.

The Department will announce the 2000 Rice Straw Utilization Tax Credit Program in August 2000, before rice harvest begins. The Department anticipates accepting applications for the 2000 tax credit on a first-come, first-served basis in late November or early December 2000.

It was suggested that the Department accept applications for the tax credit on a first-come-first-served basis prior to the harvest season. It is believed that this would facilitate arrangements between growers, handlers and end-users and improve logistics for the fall harvest season. The Department did take this under advisement during 1999 and concluded that there is no demonstrated need to change the program at this time. The Department made this determination based on two considerations. First, the cap was nearly exceeded this year, and most probably will be exceeded next year, given the anticipated development of new straw utilization facilities. Secondly, logistical problems could result if applications are accepted and approved based on contracts for purchases of future harvested and delivered straw that are not fulfilled. This situation could discourage purchases that might have been made if there were available tax credits under the cap as tracked by the existing system.

Conclusions and Recommendations:
Industry experts and the University of California, Department of Agricultural and Biological Engineering estimate that perhaps 50,000 to 55,000 tons of rice straw were harvested in 1999. Thus, about 47 percent to 52 percent of the harvested rice straw was purchased under the tax credit. Currently, the potential for harvesting rice straw is limited by equipment availability, storage availability and during some years, weather.

The rice straw utilization tax credit is limited in scope by the annual cap of $400,000 (26,667 tons of rice straw) when compared to the amount of potentially harvestable rice straw – in the order of 1 million tons. It is likely that in this coming year (2000) the amount of straw purchased and submitted to the Department for certification under the Program will exceed the program cap of $400,000. The fiber board plant, which applied for and received certification for nearly 20,000 tons, reportedly baled about 40,000 tons, well over the program cap of 26,667 tons. Assuming its successful operation into the future, this facility alone could use up the entire tax credit on an annual basis. Other rice straw utilization projects will likely result from efforts funded under the Rice Fund, administered by the Air Resources Board. This program has funded eleven projects (including the fiber board project) with hope to commercialize rice straw utilization technologies. The dairy industry will continue to claim the tax credit. In this situation, the tax credit serves to offset the transportation costs associated with hauling the straw from the Sacramento Valley rice production region to dairies in the San Joaquin Valley. It is anticipated that many more dairy operators will try to take advantage of the tax credit in the coming years.

A successful startup of a commercial straw processing facility could change the dynamics of the program drastically. Any such facility that processes straw to straw board, fiber or particle board, feed, ethanol fuel, electricity, erosion control materials, pulp or paper, or other products at a commercial scale would easily consume the amount of straw each year that would be eligible for the tax credit.

At this point in the development of these projects, project financing and straw handling infrastructure and logistics are equally formidable barriers to commercialization as the cost of rice straw. An assured reduction in the straw acquisition cost that can be provided by the tax credit can make some straw processing projects more attractive to potential investors or lenders.

As demand for the tax credit increases, and economic and environmental benefits of off-field rice straw utilization are documented, the Legislature may want to consider expanding the program by lifting the annual $400,000 cap in order to attract larger and more diverse projects.

The CDFA has also received comments concerning the equity of the “first-come, first-served” provision, since conceivably, one entity could use the entire credit. Some have suggested that a cap of $1,000 to $4,000 be established for individual applications. However, for most projects, this amount would be trivial, not providing enough of an incentive for project initiation.

The tax credit provides little incentive to new startup processing facilities with little or no California income tax liability. The Legislature may want to consider a tax credit purchase or trading program that would allow new straw utilization projects with little or no California income tax liability to sell their tax credits to a profitable entity that could take advantage of the tax credit. The CDFA has received several inquiries and suggestions in this regard.

Several members of the rice industry have suggested that the unused tax credit from each year be dedicated to other activities that support off-field utilization of rice straw. Such activities may include but not be limited to development of rice straw harvest and storage infrastructure, market development and expansion for rice straw based products and support for those potential utilization technologies not supported through other programs.

1999 Summary
Rice Straw Utilization Tax Credit Program
California Department of Food and Agriculture

Type of Business	Use	Tons	$ Credit $
Dairy	Animal Bedding	65.32	$979.80
Exporter	Livestock Feed	234	$3,510.00
Dairy	Animal Bedding	250	$3,750.00
Cattle	Livestock Feed	14	$210.00
Dairy	Animal Bedding Livestock Feed	65.32	$979.80
Cattle	Livestock Feed	2,000	$30,000
Cattle	Livestock Feed	438	$6,570.00
Manufacturer	Particle Board	19,440	$291,600.00
Dairy	Animal Bedding	525.99	$7,889.85
Manufacturer	Erosion Control	944.57	$14,168.55
Dairy	Livestock Feed	218.29	$3,274.35
Manufacturer	Erosion Control	755	$11,325.00
Dairy	Animal Bedding Erosion Control	35.7	$535.50
Cattle	Livestock Feed	252	$3,780.00
Cattle	Livestock Feed	40.5	$607.50
Home Owner	Bale Construction	9.6	$144.00
Dairy	Animal Bedding	333	$4,995.00
TOTAL		**25,621.29**	**$384,319.35**

1998 Summary
Rice Straw Utilization Tax Credit Program
California Department of Food and Agriculture

Type of Business	Use	Tons	$ Credit $
Dairy	Animal Bedding	23.87	$ 358.05
Dairy	Animal Bedding	263.11	$3,946.65
Dairy	Animal Bedding	182.95	$2,744.25
Cattle	Livestock Feed	368.32	$5,524.80
Dairy	Animal Bedding	76.01	$1,140.15
Dairy	Animal Bedding	384.42	$5,766.30
Dairy	Animal Bedding	79.46	$1,191.90
Dairy	Animal Bedding	540	$8,100.00
Dairy	Animal Bedding	84	$1,260.00
Dairy	Animal Bedding	11.42	$ 171.30
Dairy	Animal Bedding Livestock Feed	405.69	$6,085.35
Manufacturer	Erosion Control Blankets	1667.54	$25,013.10
Dairy	Animal Bedding	139.42	$2,091.30
Dairy	Animal Bedding	170.69	$2,560.35
Dairy	Livestock Feed	35	$ 525.00
Dairy	Animal Bedding Livestock Feed	48.8	$ 732.00
Manufacturer	Livestock Feed	235.92	$3,538.80
Dairy	Animal Bedding	200	$3,000.00
Cattle	Livestock Feed	969.04	$14,535.60
Citrus Grower	Erosion Control	5	$ 75.00
TOTAL		**5890.66**	**$88,359.90**

1997 Summary
Rice Straw Utilization Tax Credit Program
California Department of Food and Agriculture

Type of Business	Use	Tons	$ Credit $
Dairy	Animal Bedding	87	$1,305.00
Dairy	Animal Bedding	19.27	$289.05
Dairy	Animal Bedding	15.1	226.5
Owner/Builder	Building Construction	4	$60.00
Cattle	Livestock Feed	9	$135.00
Dairy	Animal Bedding	199.75	$2,996.25
Hydroseeding Contractor	Erosion Control	49	$735.00
Dairy	Animal Bedding	159.11	$2,386.65
Dairy	Animal Bedding	65.04	$975.60
Manufacturer	Compost/Fertilizer	1,263.75	$18,956.25
Dairy	Animal Bedding	159.82	$2,397.30
Dairy	Animal Bedding	300	$4,500.00
Dairy	Animal Bedding	181.615	$2,724.23
Dairy	Animal Bedding Livestock Feed	855.18	$12,827.70
Manufacturer	Erosion Control Blankets	58.48	$877.20
Owner/Builder	Building Construction	45.7	$685.50
Dairy	Animal Bedding	43.34	$650.10
Dairy	Animal Bedding	43.02	$645.30
Dairy	Livestock Feed	25.87	$388.05
Dairy	Animal Bedding Erosion Control	352.74	$5,291.10
Manufacturer	Livestock Feed	336.285	$5,044.28
Dairy	Animal Bedding	40.075	$601.13
Dairy	Animal Bedding	79.28	$1,189.20
Dairy	Animal Bedding	119.79	$1,796.85
Dairy	Animal Bedding	200	$3,000.00
Dairy	Animal Bedding	46.54	$698.10
Dairy	Livestock Feed	370	$5,550.00
Cattle	Livestock Feed	905.2	$13,578.00
TOTAL		**6,033.955**	**$90,509.34**

APPENDIX D - SENATE BILL 38 (PARTIAL)

BILL NUMBER: SB 38 CHAPTERED
BILL TEXT

CHAPTER 954
FILED WITH SECRETARY OF STATE SEPTEMBER 26, 1996
APPROVED BY GOVERNOR SEPTEMBER 26, 1996
PASSED THE SENATE AUGUST 31, 1996
PASSED THE ASSEMBLY AUGUST 31, 1996
CONFERENCE REPORT NO. 1
PROPOSED IN CONFERENCE AUGUST 28, 1996
AMENDED IN ASSEMBLY AUGUST 29, 1995
AMENDED IN ASSEMBLY JULY 18, 1995
AMENDED IN ASSEMBLY JUNE 30, 1995
AMENDED IN SENATE JUNE 14, 1995
AMENDED IN SENATE APRIL 6, 1995
AMENDED IN SENATE MARCH 29, 1995

INTRODUCED BY Senator Lockyer and Assembly Member Pringle
(Principal coauthors: Senator Hurtt, Assembly Member Katz, Senator Boatwright, and Assembly Member Takasugi)

DECEMBER 15, 1994

An act to add Section 17008.7 to, and to add Chapter 3.7 (commencing with Section 50199.50) to Part 1 of Division 31 of, the Health and Safety Code, to amend Sections 6358, 6366, 6377, 17052.12, 17053.8, 17053.49, 17062, 17072, 17076, 17144, 17250, 17271, 17276, 17507, 19144, 19147, 19148, 19191, 19192, 23221, 23609, 23622, 23649, 24307, 24344, 24358, 24411, 24416, 24424, and 24443 of, to amend, repeal, and add Sections 17151, 18042, and 24611 of, to add Sections 6244.5, 17052.8, 17053.12, 17053.14, 17053.42, 17053.73, 17077.5, 17084, 17134.5, 17138.5, 17141.5, 17150, 17201.5, 17210, 17213, 17218, 17255, 17267, 17279.5, 17330, 17570, 17859, 17860, 18044, 23604, 23608, 23608.2, 23608.3, 23622.5, 23642, 23701z, 24343.3, 24344.7, 24472, 24710, 24903, and 24905.5 to, and **to add and repeal Sections 17052.10** and 23610 of, the Revenue and Taxation Code, and to amend Section 1088.5 of the Unemployment Insurance Code, relating to taxation, to take effect immediately, tax levy.

LEGISLATIVE COUNSEL'S DIGEST

(7) The Personal Income Tax Law and the Bank and Corporation Tax Law authorize various credits against the taxes imposed by those laws.

This bill would provide, under both laws, a credit equal to 1/3 of the enhanced oil recovery credit allowed under a certain federal statute, as specified.

This bill would authorize a credit under both laws for each taxable or income year beginning on or after January 1, 1997, and before January 1, 2008, in an amount equal to $15 for each ton of rice straw, as defined, grown within California and purchased during the taxable or income year by the taxpayer. This bill would provide that the aggregate amount of credits granted to all taxpayers under both laws shall not exceed a specified amount. This bill would require the Department of Food and Agriculture to certify that the taxpayer has purchased the rice straw and to perform other specified duties in connection with the credit. (19) This bill would, under the Personal Income Tax Law and the Bank and Corporation Tax Law, provide specified additional conformity to federal income tax laws relating to moving expenses, modifications of income from the discharge of indebtedness, the modification of the limitation on the deduction for certain interest, the limitation on travel expenses for spouses, dependents, and other individuals, the deductibility of interest in connection with a life insurance policy of an employer, employee stock option plans, and the mark to market accounting method for securities dealers.

This bill would also, under the Personal Income Tax Law, provide specified additional conformity to federal income tax laws relating to increases in the recovery period for nonresidential real property under the accelerated cost recovery system and the treatment of certain payments to retired or deceased partners.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SEC. 6.2. Section 17052.10 is added to the Revenue and Taxation Code, to read:

17052.10. (a) For each taxable year beginning on or after January 1, 1997, and before January 1, 2008, there shall be allowed as a credit against the amount of "net tax," as defined in Section 17039, an amount equal to fifteen dollars ($15) for each ton of rice straw, as defined in Section 18944.33 of the Health and Safety Code, that is grown within California and purchased during the taxable year by the taxpayer.

(b) The aggregate amount of tax credits granted to all taxpayers pursuant to this section and Section 23610 shall not exceed four hundred thousand dollars ($400,000) for each calendar year.

(c) In the case where the credit allowed by this section exceeds the "net tax," the excess may be carried over to reduce the "net tax" for the next 10 taxable years, or until the credit has been exhausted, whichever occurs first.

(d) No deduction shall be claimed for the purchase of rice straw for which a tax credit has been claimed pursuant to this section.

(e) No credit shall be claimed for the purchase of rice straw for which a tax credit has otherwise already been claimed pursuant to this part.

(f) The Department of Food and Agriculture shall do all of the following:

(1) Certify that the taxpayer has purchased the rice straw as specified in subdivision (a).

(2) Issue certificates in an aggregate amount that shall not exceed the limit specified in subdivision (b). The certificates shall be issued on a "first come, first served" basis to reflect the chronological order that the taxpayer submitted a valid request to the Department of Food and Agriculture.

(3) Provide an annual listing to the Franchise Tax Board (preferably on computer readable form, and in a form or manner agreed upon by the Franchise Tax Board and the Department of Food and Agriculture) of the qualified taxpayers who were issued certificates and the amount of rice straw purchased by each taxpayer.

(4) Provide the taxpayer with a copy of the certification to retain for his or her records.

(5) Obtain the taxpayer's identification number, or in the case of a partnership, the taxpayer identification numbers of all partners.

(6) On or before each June 1 immediately following each year for which the credit under this section is available, provide to the Legislature an informational report with respect to that year that includes all of the following:

(A) The number of tax credit certificates requested and issued.

(B) The type of businesses receiving the tax credit certificates.

(C) A general list of the methods used to process the rice straw.

(D) Recommendations on how the credits can be issued in a manner which will maximize the long term use of the California grown rice straw.

(g) To be eligible for the credit under this section the taxpayer shall do all of the following:

(1) As part of the taxpayer's allocation request for tax credits, provide the Department of Food and Agriculture with documents, as deemed necessary by the department, verifying the purchase of rice straw and that it meets the requirements specified in this section.

(2) Retain for his or her records a copy of the certificate issued by the Department of Food and Agriculture as specified in subdivision (f).

(3) Provide a copy of the certification specified in subdivision (f) to the Franchise Tax Board upon request. If the taxpayer fails to comply with the requirements of this subdivision, no credit shall be allowed to that taxpayer under this section for any taxable year unless the taxpayer subsequently complies.

(4) Provide the Department of Food and Agriculture with his or her taxpayer identification number, or in the case of a partnership, the taxpayer identification numbers of all partners.

(h) (1) For purposes of this section, a credit shall be allowed only if the taxpayer is the "end user" of the rice straw. For purposes of this section, "end user" shall mean anyone who uses the rice straw for processing, generation of energy, manufacturing, export, prevention of erosion, or for any other purpose, exclusive of open burning, that consumes the rice straw.

(2) The credit shall not be allowed if the taxpayer is related, within the meaning of Section 267 or 318 of the Internal Revenue Code, to any person who grew the rice straw within California.

(i) This section shall remain in effect only until December 1, 2008, and as of that date is repealed.

APPENDIX E - ASSEMBLY BILL 2514

BILL NUMBER: AB 2514 CHAPTERED
BILL TEXT

CHAPTER 1017
PASSED THE SENATE AUGUST 31, 2000
PASSED THE ASSEMBLY AUGUST 31, 2000
AMENDED IN SENATE AUGUST 30, 2000
AMENDED IN SENATE AUGUST 18, 2000
AMENDED IN SENATE JUNE 26, 2000
AMENDED IN SENATE JUNE 14, 2000
AMENDED IN SENATE JUNE 12, 2000
AMENDED IN ASSEMBLY APRIL 25, 2000

INTRODUCED BY Assembly Member Thomson
(Coauthors: Assembly Members Cardoza, Florez, Machado, Maldonado, and Reyes)
(Coauthor: Senator Costa)

FEBRUARY 24, 2000

An act to add Chapter 4.7 (commencing with Section 39760) to Part 2 of Division 26 of the Health and Safety Code, relating to agricultural biomass, and making an appropriation therefor.

(Approved by Governor September 30, 2000. Filed with Secretary of State September 30, 2000.)

This bill would create a $10 million account administered by the Department of Food and Agriculture to provide incentives for businesses that use rice straw for agricultural biomass projects. I have reduced the appropriation from $10 million to $2 million.

This measure will help California utilize agricultural biomass as a means of avoiding landfill use, preventing air pollution, and enhancing environmental quality. It will help to create hundreds of direct and indirect jobs in Northern California communities with historically high levels of unemployment. AB 2514 will foster alternative uses for rice straw and create new markets for recycled rice straw products.

GRAY DAVIS, Governor

LEGISLATIVE COUNSEL'S DIGEST

AB 2514, Thomson. Agricultural biomass and rice straw.

Existing law establishes the Rice Straw Demonstration Project Fund, and requires the State Air Resources Board to administer a demonstration program for the development of new rice straw technologies through the awarding of grants.

This bill would create the Agricultural Biomass Utilization Account in the Department of Food and Agriculture Fund, to be administered by the Department of Food and Agriculture in consultation with the state board and the California Integrated Waste Management Board.

The bill would appropriate $10,000,000 from the General Fund to the account for the purposes of providing incentives for businesses that utilize agricultural biomass. The account would also include any moneys secured by the Secretary of Food and Agriculture for those purposes. The $10,000,000 appropriated from the General Fund, minus administrative costs of up to 7%, would be required to be utilized to provide grants to persons that utilize rice straw for various purposes.

Appropriation: yes.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Chapter 4.7 (commencing with Section 39760) is added to Part 2 of Division 26 of the Health and Safety Code, to read:

CHAPTER 4.7. AGRICULTURAL BIOMASS UTILIZATION ACCOUNT

39760. The Legislature hereby finds and declares that the rice industry has led many other commodity groups in developing alternatives to open-field burning. In order to aid in the continuation of this role of leadership within the agricultural industry and to enable the transition to a free-market utilization of biomass, funds are needed to provide grants to persons that utilize agricultural biomass and rice straw.

39761. For the purposes of this chapter, the following terms mean:

(a) "Department" means the Department of Food and Agriculture.

(b) "Secretary" means the Secretary of Food and Agriculture.

39762. (a) (1) The Agricultural Biomass Utilization Account is hereby created in the Department of Food and Agriculture Fund.

(2) The sum of 10 million dollars ($10,000,000) is hereby appropriated from the General Fund to the Agricultural Biomass Utilization Account for expenditure for the purposes identified in subdivision (b).

(b) The account shall be administered by the department, in consultation with the State Air Resources Board and the California Integrated Waste Management Board, for the purpose of providing grants to persons that utilize agricultural

biomass as a means of avoiding landfill use, preventing air pollution, and enhancing environmental quality.

(c) Moneys in the account shall include moneys transferred from the General Fund pursuant to subdivision (a) and any moneys solicited by the secretary from other sources.

(d) The secretary shall actively solicit funds from other federal, state, and private sources with the goal of initially supplementing and eventually supplanting the appropriation from the General Fund made pursuant to subdivision (a).

(e) The department may implement similar grant programs for other commodity groups that are used for the purposes set forth in paragraphs (1) to (6), inclusive, of subdivision (e) of Section 39763.

(f) The department shall not utilize more than 7 percent of the funds described in subdivision (a) for the administration of the account.

39763. (a) The funds appropriated by paragraph (2) of subdivision (a) of Section 39762, less administrative costs, shall be dedicated for grants to persons that utilize rice straw.

(b) Grants shall be provided pursuant to this chapter in a manner to be determined by the department, and shall include, but shall not be limited to, grants on a per-ton basis and a per-project basis.

(c) On or before July 1 of each year, the secretary shall set the per-ton grant level in an amount of not less than twenty dollars ($20) per ton of rice straw so utilized.

(d) Grants shall not be provided pursuant to this section for the purchase of any rice straw for which a tax credit has been claimed pursuant to Section 17052.10 of the Revenue and Taxation Code.

(e) A per-ton grant may be provided pursuant to this chapter only if the applicant is the "end-user" of agricultural biomass. For purposes of this subdivision, "end user" means a person who uses agricultural biomass for any of the following purposes:

(1) Processing.

(2) Generating energy.

(3) Manufacturing.

(4) Exporting.

(5) Preventing erosion.

(6) Any other environmentally sound purpose, excluding open-field burning, as determined to be appropriate by the department.

(f) Criteria to be considered by the department in determining whether to award a grant pursuant to this chapter shall include, but shall not be limited to, the following:

(1) Quantity of biomass to be utilized.

(2) Whether the proposed use offers other environmental or public policy benefits, including but not limited to, landfill avoidance, pollution prevention, electrical generation, and sustainability.

(3) The degree to which the proposed grant would assist in moving the commodity group toward an eventual free market utilization of biomass without the assistance of government.

(g) The secretary shall select grant recipients in consultation with the State Air Resources Board, the Integrated Waste Management Board, and the advisory committee created pursuant to subdivision (l) of Section 41865 from a list of potential grantees recommended by the Department of Food and Agriculture.

APPENDIX F - ASSEMBLY BILL 1489

BILL NUMBER: AB 1489 CHAPTERED
BILL TEXT

CHAPTER 181
FILED WITH SECRETARY OF STATE JULY 26, 1999
APPROVED BY GOVERNOR JULY 26, 1999
PASSED THE SENATE JULY 15, 1999
PASSED THE ASSEMBLY MAY 10, 1999
AMENDED IN ASSEMBLY APRIL 5, 1999

INTRODUCED BY Assembly Member Maldonado

FEBRUARY 26, 1999

An act to amend Section 35402 of the Vehicle Code, relating to vehicles.

LEGISLATIVE COUNSEL'S DIGEST

AB 1489, Maldonado. Length of vehicles: extensions.

Existing law limits the length of vehicles and combinations of vehicles coupled together. Under existing law, any extension or device used to increase the carrying capacity of a vehicle is generally included in measuring the length of a vehicle. However, extensions of not more than 18 inches in length on the last vehicle in a combination of vehicles transporting loads are not included in measuring the length when the vehicles are loaded.

This bill would not include, in measuring the length, an 18-inch extension on the front of the first trailer and the rear of the last vehicle when the vehicles are loaded and are on highways, other than those highways designated by the United States Department of Transportation as national network routes.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 35402 of the Vehicle Code is amended to read:

35402. (a) Any extension or device, including any adjustable axle added to the front or rear of a vehicle, used to increase the carrying capacity of a vehicle shall be included in measuring the length of a vehicle, except that a drawbar shall not be included in measuring the length of a vehicle but shall be included in measuring the overall length of a combination of vehicles.

(b) Notwithstanding subdivision (a), extensions of not more than 18 inches in length on each end of a vehicle or combination of vehicles used exclusively to transport vehicles shall not be included in measuring the length of a vehicle or combination of vehicles when the vehicles are loaded.

(c) Notwithstanding subdivision (a), extensions of not more than 18 inches in length on the front of the first trailer and the rear of the last vehicle in a combination of vehicles transporting loads shall not be included in measuring the length of a vehicle or combination of vehicles when the vehicles are loaded and are on highways, other than those highways designated by the United States Department of Transportation as national network routes.

(d) Notwithstanding subdivision (a), any extension or device which is not used to carry any load and which does not exceed three feet in length, added to the rear of a vehicle, and is used exclusively for pushing the vehicle or a combination of vehicles, which vehicle or combination of vehicles is designed and used exclusively to transport earth, sand, gravel, and similar materials, shall be included in measuring the length of the vehicle but shall not be included in measuring the overall length of the combination of vehicles.

(e) Notwithstanding subdivision (a), a truck semitrailer combination, but not a truck tractor and semitrailer combination, may use a sliding fifth wheel, or a truck tractor, semitrailer, trailer, and a truck-trailer combination may use a sliding drawbar, to extend the length of the combination by not more than 2 feet 6 inches while traveling 35 miles per hour or less on any highway, except a freeway. These provisions shall apply, however, to freeway onramps and offramps and freeway connectors. The sliding fifth wheel or drawbar when extended shall not be included in measuring the overall length of the combination of vehicles if the pivot point of the semitrailer connection is more than two feet to the rear of the center of the rearmost axle of the motortruck or if the distance from the pivot point to the center of the rearmost axle of the semitrailer does not exceed 34 feet.

Combinations of vehicles permitted by this subdivision shall be in compliance with the weight limits provided in Article 1 (commencing with Section 35550) of Chapter 5 whenever any drawbar or sliding fifth wheel is extended, contracted, or in any intermediate position as provided for by this subdivision.