



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

# **Final Cost-Benefit and Least Burdened Alternative Analysis**

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*Chapter 173-430 WAC - Agricultural Burning*

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# **Final Cost-Benefit and Least Burdensome Alternative Analysis**

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## **Chapter 173-430 WAC Agricultural Burning**

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## Executive Summary

In this rulemaking, Ecology is updating Chapter 173-430 WAC to:

- Adjust the field burning fee to cover the costs of administering and enforcing the permit programs.
- Change the pile burning (mostly orchard tear-out) fee to a per-ton fee rather than a per-acre fee.
- Address the finding in *Ted Rasmussen Farms, LLC v. State of Washington, Department of Ecology*, Docket # 22989-1-III (*Rasmussen v. Ecology*), by removing a section of the existing rule that is beyond Ecology's regulatory scope.
- Make housekeeping changes for consistency with the authorizing statute.

The rulemaking was authorized by both existing law and by Substitute Senate Bill 6556 (passed in 2010). The Legislature authorizes ongoing agricultural burning fee increases until the fee reaches the \$3.75 cap per acre for field burning, and the \$1 cap per ton for pile burning. RCW 70.94.6528(6)(b) directs the Task Force to determine fees at a level to, "cover the cost of administering and enforcing the programs" and provide research funds.

The changes to the fee schedule include:

- A \$5 increase in the minimum field burn permit fee, and a 75-cent increase in the per-acre fee.
- A \$5 increase in spot burn permit fees.
- Charging for pile (orchard tear-out) permits by the ton, with fees changing from a minimum of \$50, or \$2.25 per acre (whichever is more), to a minimum of \$80 for the first 100 tons, plus 50 cents per additional ton.

### **Probable benefits include:**

- Avoided reductions in burn days resulting from up to 75 percent reduction in funding.
- Avoided reduction in agricultural burning research funding.
- Avoided reductions in permit program administration.
- Clarification and improved compliance.

### **Probable costs include:**

- \$119 thousand per year in increased permit fees.

## **CHAPTER 1: Introduction**

The Administrative Procedure Act (Chapter 34.05 RCW) requires that, before adopting a significant legislative rule, Ecology must, “Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented.” [RCW 34.05.328(1)(c)]

For the amendments to the agricultural burning rule, this means Ecology must estimate the impacts of the rule changes on individuals, businesses, and the public. This includes changes in costs and changes in the value of agricultural burning and the services provided for the fees paid. Estimated impacts are determined as compared to the previous regulatory environment—the way agricultural burning would be regulated in the absence of the final rule amendments.

The previous regulatory environment is called the “baseline” in this document. It includes only previously existing regulation through laws and rules at federal, state, and local levels. It does not include elements such as guidance or unofficial standard practices in industry or business.

This document provides the public with an overview of the methods Ecology used to perform its analysis, and the most likely impacts found.

### **History**

The Washington Clean Air Act of 1991 (Chapter 70.94 RCW) regulates multiple air quality standards and practices in Washington. Among these is outdoor burning – including agricultural burning.

Chapter 173-430 WAC (Agricultural Burning) implements the clean air act. The rule defines:

- Fees.
- Best management practices.
- Fee use and research.
- Delegation authority.
- Permit conditions and procedures.

### **Regulatory Baseline**

The regulatory baseline is the way agricultural burning would be done if this rule was not adopted – that is, the previously existing laws and rules at various jurisdictional levels that determine how agricultural burning is regulated and performed now. The baseline does not include guidance and practices commonly used in agricultural burning that are not technically legally required.

Under the governing law and its implementing rule (Chapter 70.94 RCW and Chapter 173-430 WAC, respectively) entities such as, but not limited to,

businesses, individuals, governments, and other organizations must have an agricultural burning permit to do any agricultural burning.

While it is legal to burn for approved agronomic reasons with a permit, it is not legal to allow smoke to impact others. The agricultural burning of field crop residue and orchard tear-out residue can directly impact the safety and health of citizens breathing the smoke-filled air. See Chapter 2 for further discussion of the avoided health costs that result from regulation of agricultural burning and smoke.

To help reduce smoke-related environmental and health concerns, the Department of Ecology's Eastern and Central Washington Burn Team makes a daily burn/no-burn decision called the "burn call" for agricultural burning permit holders. The burn call provides daily current and forecasted air quality conditions and burn decisions to the public and business. This information is available online, by phone, or through listserv.

### **Agricultural Burning Practices and Research Task Force**

The Agricultural Burning Practices and Research Task Force ("Task Force") is established by RCW 70.94.6528 of the Washington Clean Air Act. The goal of the Task Force is to reduce air pollution emissions from agricultural burning. The Task Force, chaired by the Department of Ecology, includes from many different interests. The representatives include:

- Eastern Washington local air authorities.
- The agricultural community.
- The Department of Agriculture.
- Local universities or colleges.
- Public health.
- Conservation districts. .

The Task Force is empowered by the Clean Air Act to develop Best Management Practices (BMP's) to reduce air emissions from agricultural activities, determine the level of permit fees, and identify research opportunities.

### **Agricultural Burn Permits**

Ecology requires a permit for all types of agricultural burning, with the exception of:

- Orchard prunings.
- Organic debris along fence lines or irrigation or drainage ditches.
- Organic debris blown by the wind.

Burn permits are issued at the local level by Ecology, local air authority, or a delegated permitting authority (e.g., a county or conservation district). Ecology provides access to burn zone maps outlining these areas.

The relevant permitting agency will only process complete applications. .



Incomplete applications are denied. Complete applications include all of the following:

- A completed permit application.
- A map of the area to be burned.
- A fee payment.

Agricultural burn permits in Asotin, Garfield, Columbia, Walla Walla, Franklin, Adams, Grant, or Whitman counties are processed through local conservation districts:

- Adams Conservation District.
- Asotin Conservation District.
- Columbia Conservation District.
- Franklin Conservation Dept.
- Garfield; Pomeroy Conservation District.
- Grant Conservation District.
- Othello Conservation District.
- Walla Walla Conservation District.
- Palouse Conservation District.
- Palouse Rock Lake Conservation District.
- Pine Creek Conservation District.
- Whitman Conservation District.

In western Washington, as well as Benton, Yakima, and Spokane counties, local air agencies process agricultural burn permits:

- Benton Clean Air Agency
- Northwest Clean Air Agency
- Olympic Region Clean Air Agency
- Puget Sound Clean Air Agency
- Southwest Clean Air Agency
- Spokane Regional Clean Air Agency
- Yakima Regional Clean Air Agency

Agricultural burn permits for land on Indian reservations are processed through tribal governments. Burning in all other areas is processed directly through Ecology.

There are separate permit applications for field burning, pile, spot burning, and bale burning.

### **Best Management Practices**

Applicants must include best management practices (BMPs) as identified by the state's agricultural burning practices and research task force ("Task Force") as part of their application. BMPs are one of the ways to demonstrate the need to burn. Permit applicants not using BMPs must establish their final burn is reasonably necessary and that no practical alternative is available.

The burden of proof is on the applicant, and the demonstration must satisfy the local clean air authority with jurisdiction, or the Department of Ecology, and the local delegated permitting authority, if there is a local permitting authority.

## Permit Fees

The previous rule listed fees for different types of agricultural burning. Fees were determined by the type of burning, as well as the size of the permitted burn area. Under the baseline, agricultural burning fees were:

Type of permit	Fee amount
Orchard burn	\$50.00 (minimum) or \$2.25 per acre, whichever is more.
Field burn	\$25.00 (minimum) or \$2.25 per acre, whichever is more.
Bale burn	\$25.00 (minimum field burn fee)
Spot burn	\$25.00 (minimum field burn fee)

Permit fees fund program activities, including administration and smoke management, as well as research on agricultural burning. See Chapter 2 for more discussion of these program components and research funding.

## Changes under the Final Rule

In this rulemaking, Ecology is updating Chapter 173-430 WAC to:

- Increase burning fees to cover more of the costs of administering and enforcing the permit programs.
- Change the pile burning (mostly orchard tear-out) fee to a per-ton fee rather than a per-acre fee.
- Address the finding in *Ted Rasmussen Farms, LLC v. State of Washington, Department of Ecology*, Docket # 22989-1-III (*Rasmussen v. Ecology*), by removing a section of the existing rule that is beyond Ecology’s regulatory scope.
- Make housekeeping changes for consistency with the authorizing statute.

The rulemaking was authorized by both existing law and by Substitute Senate Bill (SSB) 6556 (passed in 2010). The Legislature authorizes ongoing agricultural burning fee increases until the fee reaches the \$3.75 cap per acre for field burning, and the \$1 cap per ton for pile burning. RCW 70.94.6528(6)(b) directs the Task Force to determine fees at a level to, “cover the cost of administering and enforcing the programs” and provide research funds.

### New Fees and Changes to Pile Burning (mostly orchard tear-out)

According to an internal review of budget records, past fees covered only about 25 percent of costs to administer and enforce the agricultural burning program. Increasing fees will bring the program closer to cost recovery. Since the State’s General Fund deficit could limit the amount of money available to subsidize the

program, an agricultural burning program that pays for itself may prevent cuts to the program. This would, in turn, limit resulting cuts to services provided to farms, businesses, and the public – especially in terms of allowable burn days.

Additionally, SSB 6556 introduced a per-ton fee for orchard pile burns to replace the per-acre fee. The volume of piled material burned exceeds the volume of crop residue from a field of the same size. A per-ton fee structure provides a closer link between the size of the fee and the amount of material burned.

The newly adopted fee schedule is:

Type of permit	Fee amount
Orchard burn	\$80.00 (minimum) up to 100 tons (inclusive), plus 50 cents per additional ton.
Field burn	\$30.00 (minimum) up to 10 acres (inclusive) , plus \$3.00 per acre,
Spot burn	\$30.00 (flat fee)

Ecology evaluated the options for setting the fees in 2012 and later, and determined that the preferred process (as in the final rule) is regular review and public input to fee setting. Ecology chose this option over inclusion of a set fee structure or tying of fees to an index measure of growth, such as an inflation index.

### **Rasmussen v. Ecology**

*Rasmussen v. Ecology*<sup>1</sup> requires Ecology to remove language from the existing rule that the court found to be outside of Ecology’s regulatory authority. The final rule eliminates the identified language.

### **Clarification and Reorganization**

Finally, Ecology clarified the rule language and reorganized the structure of the rule to improve understanding of the requirements, and in turn, improve compliance with the rule.

### **Analytical Scope Comments**

Ecology is raising fees to a level determined by the Task Force. While the level of fees determined for each type of agricultural burning is technically outside the final rule’s scope (determined by the Task Force; not determined independently by Ecology), Ecology is the chair of the Task Force, and has chosen to propose the higher fees determined by the Task Force in rule.

Ecology is only required to analyze rule amendments in which Ecology had discretion. Because the final fees were determined by the Task Force, it is somewhat ambiguous the extent to which Task Force decisions are within

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<sup>1</sup> *Ted Rasmussen Farms LLC v. State of Washington, Department of Ecology*, Docket # 22989-1-III (*Rasmussen v. Ecology*)

Ecology's discretion. Ecology is the entity amending the rule and officially adopting the fees, but they were not determined by Ecology alone, but rather by the Task Force. Despite this minor ambiguity, Ecology believes that it will benefit readers of this document to include the impacts of the overall rule changes.

## **Analytical Format**

The remainder of this analysis is organized into the following chapters:

- Benefits and Costs of the Final Rule ([Chapter 2](#)): Qualitative discussion of the likely benefits and costs arising from the final rule, as compared to the baseline of the previous rule.
- Quantified Costs and Benefits ([Chapter 3](#)): Methodology and results of quantitative analysis, where possible.
- Observations and Conclusions ([Chapter 4](#))
- Least Burdensome Alternative Analysis ([Chapter 5](#))

## **CHAPTER 2: Benefits and Costs of the Final Rule**

Raising permit fees to support program activities and agricultural burning research, removing irrelevant rule language, and clarifying the language and organization of the rule result in a set of likely benefit and cost impacts. This chapter discusses the path of those impacts, and lists how each benefit or cost is evaluated in this analysis – qualitatively, or quantitatively as well. For those benefits or costs that were able to be evaluated quantitatively with low uncertainty, see Chapter 3 for methodology and results.

### **Description of Benefits**

The final rule likely generates a set of possible benefits, largely by avoiding otherwise necessary program cuts under the baseline. These include:

- Avoided reductions in burn days.
- Reallocation of funds to research.
- Avoided reductions in permit program administration.
- Clarification and improved compliance.

Each of these benefits is discussed further below, with additional discussion of how each was considered in this analysis – qualitatively, or whether it could be evaluated quantitatively as well.

#### **Avoided Reduction in Burn Days**

The final rule raises permitting fees in order to maintain funding for the agricultural burning program. In light of the current budget situation for the State's General Fund, and the Legislature's choice to authorize fee changes and increases, the baseline scenario would likely result in cuts to staff, program services, or both. With current coverage of only approximately 25 percent of program costs coming from fees<sup>2</sup>, and the remainder subsidized by the General Fund, these cuts could be significant. In addition, the degree of the cuts is unclear, (as the General Fund funds numerous agencies and programs). Uncertainty exists in future levels of available state funds as well.

Reductions in staffing of the program would likely result in reduced ability to maintain a 7-day per week smoke management program. This Ecology program (funded by one component of the permit fee) monitors air quality and determines appropriate burn days for permit holders. A permit allows the holder to burn on allowed burn days. However, it does not guarantee that he will be able to take advantage of a given burn day for his area, if those days are not appropriate or timely for the permit holder's schedule..

A reduced ability to monitor and determine burn days would likely result in an increased number of permit holders being unable to take advantage of necessary

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<sup>2</sup> Internal analysis of historic ratio of collected fees to program costs. 25 percent is a general average over multiple years of program funding.

agricultural burning. This would likely occur because of either a reduced number of burn days, or changes in when available burn days occur.

Permit holders unable to take advantage of remaining burn days would need to use alternatives to agricultural burning. As they have already demonstrated a need to use burning rather than other alternatives, these permit holders would likely incur additional cost in using other means to manage crop residue. Those alternatives might include different planting and tillage practices, clipping and bailing, alternate crop-rotation practices, herbicides, and pesticides.

Ecology included this benefit qualitatively in this analysis. While, in a worst-case scenario, the agricultural burning program could be reduced by 75 percent (receiving only fee funding), there is significant uncertainty as to the degree of reductions, and, in turn, the possible future ways of determining allowable burn days within a reduced program week. In addition, permit holders do not necessarily operate on a needed burn schedule that is consistent with other permit holders, or necessarily consistent year-to-year.

## **Research Funding**

Part of Ecology's agricultural burning fees goes to fund research into alternatives to agricultural burning. The final fee maintains the current level of funds for research instead of diverting research fund to cover a large portion of program costs.

Every two years, Ecology puts out a request for research proposals to the public, for research that will improve the ability of businesses and the public to employ alternatives to agricultural burning in a beneficial manner. Proposals for research are presented to the Task Force, who then recommends which projects should be funded. Ecology can then accept the recommendations of the Task Force or choose which projects to fund.

The resulting research can result in better alternatives to burning or safer burning practices. These alternatives or new practices can benefit both the agricultural community and the public, by:

- Providing information that might reduce costs associated with dealing with crop residues and orchards using non-burn methods.
- Reduce the environmental and health impacts of burning itself.

Recent research funded by the program includes:

- Alternatives to Burning Crop Residues in Alfalfa Grown for Seed.
- Development of Kentucky Bluegrass Cultivars for Non-burn Seed Production.
- Straw Management and Crop Rotation Alternatives to Stubble Burning.
- Straw Utilization for Fiber and Chemicals.

See Appendix A for a summary of research projects funded through this program.

Ecology included this benefit qualitatively in this analysis. Due to the degree of variance in the costs of research, Ecology did not include a quantitative analysis of this benefit. In addition, the multiple variables relating research to its results, and to the utilization and usefulness of those results limit the ability to quantify the impacts of a reduction in burn alternative research.

### **Avoided Reductions in Administration**

Reductions in funding would likely result in reductions in the administrative capacity of the program, or of delegated conservation districts or local air authorities. This could, in turn, result in delays in permit processing, though the degree and significance of such delays is difficult to determine. The final rule raises permit fees in order to reduce the likelihood of reduced funding for administration.

Ecology included this benefit qualitatively in this analysis, due to uncertainty inherent to its quantification.

### **Clarification and Improved Compliance**

The final rule clarifies language and organization to facilitate understanding of its requirements. These changes do not alter the meaning or requirements of the rule, but are intended to allow reductions in time and effort in understanding of, and compliance with, the rule.

Ecology included this benefit qualitatively in this analysis.

## **Description of Costs**

The final rule likely generates a set of possible costs, largely through direct fee increases, or through the redefinition of the pile burning fee from per-acre to per-ton, but also from avoided reductions in burning that would occur under the baseline. These include:

- Increased permit costs for some permittees.
- Possible smoke impacts.
- Future fee evaluation costs.

Each of these costs is discussed further below, with additional discussion of how each was considered in this analysis – qualitatively, or whether it could be evaluated quantitatively as well.

### **Increased Permit Costs for Some Permittees**

The fee schedule included in the final rule is likely to result in increased fees for some permittees. For others, Ecology does not expect total permit fees to change. Ecology included this cost qualitatively in this analysis. See Chapter 3 for complete discussion of this cost and how it was quantified.

## **Possible Smoke Impacts**

Ecology acknowledges that by avoiding reductions in burn days that are likely under the baseline, the final rule simultaneously avoids a reduction in emissions of smoke from agricultural burning. This smoke contains particulates and toxins that are hazardous to health when people are exposed to them. However, Ecology notes that the burn days that are retained by the final rule are determined by careful monitoring and evaluation of air-quality variables, and by definition would occur on days and in areas and quantities that minimize the risk to human health and the environment. Ecology therefore considers this cost to be small or zero. Ecology did not, therefore, include it qualitatively or quantitatively in this analysis.

## **Future Fee Evaluation Costs**

The final rule creates a recurring public process for updating permit fees to appropriate levels. While, based on general price trends, Ecology expects these updates to raise fees up to the legislative cap. Ecology also expects the fees to be equal to the program costs and associated benefits to business and the public they fund. Ecology would not necessarily hold that belief in the absence of a public process or with a fee-updating plan that either explicitly stated future fees, or that associated fee increases with a standard price index. Ecology does not expect this cost to be significant in costs relative to benefits.



## **CHAPTER 3: Quantified Costs and Benefits**

Ecology quantified the most likely costs of the final rule, and partially quantified the likely benefits of the final rule, where possible given available data and low uncertainty. To estimate the costs likely resulting from the final rule, Ecology analyzed the likely impact of increased fees for some permittees. For benefits, Ecology estimated the impact of avoided reductions in burn days, and of reallocated funds toward research funded by permit fees.

### **Model Inputs**

#### **Existing Permit Data**

Ecology collected existing permit data for current agricultural burning permits. This data included the type of permitted burn and acreage, as well as permittee information. For those permittees holding more than one permit, Ecology combined calculations so that all results were for individual permittees.

#### **Baseline Fee Schedule**

Baseline fees assigned to each permittee were based on the fee schedule in the existing rule. This generated a range of fees from \$25 to \$7,500 across all permittees.

#### **Final Fee Schedule**

Ecology based the likely fees for each permittee based on the new fee schedule in the final rule. This generated a range of fees from \$30 to \$10,000 across all permittees.

#### **Assumed Tonnage**

Based on professional experience, Ecology assumed an acre of orchard burning could generate between 15 and 20 tons of pile burning. Ecology chose to use the larger value of 20 tons per acre, to ultimately calculate a conservatively high estimate of costs under the final rule.

#### **Industry and Employment Numbers**

Ecology categorized businesses by industry and size, using the North American Industry Classification System (NAICS) and employment numbers associated with those industries from the Washington State Employment Security Department. This information was used to calculate impacts by employer size reported in the associated Small Business Economic Impact Statement (Ecology publication number 10-02-013).

#### **Fee Collection History**

Past collection of permit fees used to fund program expenditures, including smoke management, research, and administrative costs.

## **Program Cost History**

Past expenditures on the agricultural burning program, including smoke management, research, and administrative costs.

## **Calculations**

### **Quantifiable Cost Impact**

For each existing permittee (representing likely future permittees), Ecology calculated the difference between the agricultural burning permit fee under the baseline and under the final rule. This generated a range of impacts between a five-dollar increase in fees and an increase of approximately \$2,400 at the individual permit level. The largest increases occurred for field burning permits with the largest acreage, those permittees with multiple permits, and for large orchards that would pay by the ton rather than by acreage under the final rule.

### **Quantifiable Benefit Impact**

While Ecology could not calculate the dollar equivalent of quantifiable benefits of the final rule, Ecology considers it important to provide some indicator of the degree of those benefits. Ecology therefore estimated the approximate percentage of program costs that is covered under the baseline existing rule, and presents that value in this document as a quantitative indicator of benefits.

## **Overall Results**

Ecology estimated that the final rule could result in total increased permit costs of \$119 thousand per year, across all permittees. This total arose from per-permittee impacts between zero and \$2,400 per permit.

Ecology estimated the final rule could result in avoiding the need for a potential 75 percent agricultural burning program cuts. It is unclear how Ecology would distribute those cuts across staff and research expenditures, as this would be a future internal decision made by Ecology based on the overall long-run funding situation. This worst-case scenario (assuming no reductions in permit applicants) represents the restriction of agricultural burning funding to only to fees. The final rule could prevent up to that worst case scenario, all else held equal. These possible avoided program cuts translate to avoided reductions in viable burn days and permit processing abilities.

## **CHAPTER 4: Observations and Conclusions**

Ecology separately calculated the qualitative and quantified net benefits of the final rule amendments, accounting for likely costs and benefits of the final changes. Based on the combined qualitative and quantitative net benefits that Ecology finds to be likely under the final rule (as compared to the existing rule), Ecology concluded that the benefits of the final rule will most likely exceed the probable costs.

Probable benefits include:

- Avoided reductions in burn days resulting from up to 75 percent reduction in funding.
- Avoided reduction in agricultural burning research funding.
- Avoided reductions in permit program administration.
- Clarification and improved compliance.

Probable costs include:

- \$119 thousand per year in increased permit fees.

## **CHAPTER 5: Least Burdensome Alternative Analysis**

RCW 34.05.328(1)(e) requires Ecology to “determine, after considering alternative versions of the rule and the analysis required under (b), (c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection.”

### **Alternative Content and Responses**

Ecology considered alternatives to the requirements of the final rule during the rule development process. These alternatives, and reasons for not including them in the final rule, are listed below.

#### **No Action**

To the extent possible outside of legislative and court requirements (including setting pile burning fees based on tonnage, and removing rule language that was deemed beyond Ecology’s regulatory authority), Ecology could have taken no further action, or action that would have adjusted fees to likely have zero change.

Taking no action would have likely been less burdensome in direct permit costs than the increased fees under the final rule, but would have likely also impacted those required to comply with the rule negatively through reduced services, usable or total burn days, and administrative capability.

Ecology believes the fee structure determined by the Task Force in the final rule accurately reflects likely program costs of continuing adequate levels of service to business and the public. Therefore, Ecology believes the no-action alternative would create at least as much burden for those required to comply as the final rule.

#### **Alternate Distribution of Fees**

As the Task Force determined the fee schedule, Ecology was unable to propose an alternative schedule of permit fees.

### **Conclusion**

Based on research and analysis required by RCW 34.05.328(d)(e) the Department of Ecology determines:

*There is sufficient evidence that the final rule is the least burdensome version of the rule for those who are required to comply, given the goals and objectives of the law for Ecology to propose the rule.*

## APPENDIX A: Summary of Research Projects Funded

Project and Proponent	ABTF Budget	Project Status	Cost
Strawboard / Battelle, PNNL	\$30,000	Completed	\$30,000
Alternative Cropping Systems 1997 (start up year) / Palouse Rock Lake CD	\$6,000	Folded into NW crop project	\$4,500
Pests and High Residue, Direct Seeding (Wilke Farm) / Lincoln County CD	\$82,870	Completed	\$84,365
Strip Tillage, Stubble Burning Alternative / Pine Creek CD	\$8,310	Completed	\$6,419
Alternatives to Burning for Goat Grass Control / Whitman CD	\$14,100	Completed	\$15,042
Strawboard Phase 2 / Sun Straw Fiber	\$22,500	Ended (work was not completed)	\$4,437
Grass Seed Alternatives / University of Idaho	\$26,000	Completed	\$26,000
Cereal Burning Emissions / Air Sciences & Missoula Fire Science Lab	\$195,800	Completed	\$195,800
Pulping Wheat Straw & Effluent into Fertilizer / Fiber Futures	\$25,000	Completed	\$25,000
Straw Management & Crop Rotations (Cunningham Farm) / Washington State University	\$60,016	Completed	\$60,016
Straw Pulping – Phase 2 / Lewis Engineering	\$44,107	Completed	\$44,107
Direct Seeding into Irrigated Stubble (Lind Farm) / Washington State University	\$19,231	Completed	\$19,231
Straw Management & Crop Rotations (Cunningham Farm) / Washington State University	\$63,000	Completed	\$63,000
Direct Seeding into Irrigated Stubble (Lind Farm) / Washington State University	\$20,000	Completed	\$20,000
Straw Pulping – Phase 3 & 4 Lewis engineering	\$82,000	Completed	\$82,000
Direct Seeding into Irrigated Stubble (Lind Farm) / Washington State University	\$22,000	Completion June 2007	\$22,000
Straw Pulping – Lewis engineering	\$80,000	Completion June 2007	\$80,000
Alternatives to Burning and the Effects on Insect, Weed, and Disease Pests in Alfalfa Seed Fields	\$49,068	Completion June 2007	\$49,068
Development of High Yielding Turf Type Kentucky Bluegrass Varieties for Non-burn16	\$10,000	Completion June 2007	\$10,000