



Chapter 173-430 WAC

Small Business Economic Impact Statement for the Proposed Changes to the Agricultural Burning Rule

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I. Executive Summary

The purpose of this rule amendment is to incorporate legislative changes, integrate technical topics and include settlement agreement items related to agricultural burning that have occurred since the development of Chapter 173-430 WAC in 1994. The proposed amendments will provide clarifications and slight modifications to agricultural burning program requirements in Washington State. As required under RCW 34.05, Ecology is providing this Small Business Economic Impact Statement as part of the rule adopting process.

Historically, every Small Business Economic Impact Statement completed on WAC 173-430 has found that there are disproportionate benefits to small businesses.¹ Burning has many benefits and is a low cost method of handling a variety of agricultural issues including disease, pests, weeds and excess stubble. In some areas, burning may aid in direct seeding practices which is a less soil invasive farming practice than traditional tillage. Additionally, the rule language has been updated to allow burning for “all agricultural products” which, along with recent legislation, may provide additional incentives for bio-diesel production in the Washington State. One amendment incorporates the "metered burning" system (described in the Settlement Agreement), which Ecology has developed during the past several years. This allows permitting authorities to make burn calls during periods of time when particulate exposure is less likely to occur in populated areas. This amendment reduces the cost impact of the existing rule by allowing agricultural burning to take place while causing minimal effects to public health.

The costs of the rule to small businesses include the burn fee increase proposed for 2008 by the Agricultural Burning and Research Task Force and additional application documents.

As the following report details, small businesses dominate the industry affected by agricultural burning in Washington State. This analysis estimates potential industry benefits from rule amendments at \$7.3 million (detailed in Appendix E.) The costs of the rule include fee increases and other burdens and have been determined to disproportionately affect small businesses. Ecology expects that the rule amendments in this analysis will provide net benefits to overall business and will disproportionately benefit small businesses.

II. Legal History

The Washington State legislature established an agricultural burning program in 1991. In following, Ecology established rules for a full-scale agricultural burning program that became effective in 1995. Since that time, additional legislation, rulemaking and

¹ Small Business Economic Impact Statement for Revisions of Chapter 173-403 to Limit Grass Seed Field Burning Emissions, July 24, 1996. Small Business Economic Impact Statement for Revisions of Chapter 173-403 to Certify Alternatives to Grass Seed Field Burning, March 31, 1998.

litigation related to grass-seed field burning has taken effect. In 1999, a Voluntary Memorandum of Understanding (MOU) Agreement with the Washington Association of Wheat Growers to reduce emissions was finalized. Additionally, litigation by Save Our Summers resulted in a 9th Circuit Court of Appeals Settlement in November 2001. Ecology initiated rulemaking to comply with the Settlement Agreement and fulfill the mandatory regulatory review described in the Washington State Administrative Procedure Act, Chapter 34.05 RCW.

III. Description of Changes Created by the Amendments

The majority of the changes in this amendment are required by statute or by the court approved settlement agreement. A crosswalk between the old rule and the amended rule is located in Appendix A. The amendments which rely directly on the statute or court approved settlement agreement are not required to be analyzed under 19.85 RCW and therefore are not evaluated in this review. The following sections contain amendment components of the rule that provide additional direction beyond the law and court order decisions and therefore are evaluated in this analysis:

WAC 173-430-030 (1) This section explains that propane use to remove vegetative material is considered agricultural burning. The law has never been interpreted to allow propane burning to be a basis for avoiding a permit; this addition will clarify the interpretation of the rule language.

WAC 173-430-030 (8) The definition of farmer is updated to include any person engaged in the growing or production for sale of any “agricultural product.” This will allow agricultural burning by farms that produce products that are inputs for alternative production purposes such as poplar trees used for pulp and paper or seed crop used for bio-diesel. This increases access to agricultural burning.

WAC 173-430-040 (2) The burn calls and metering amendment incorporates management practices for burning that have developed over the last 10 years and in doing so, have moved beyond the straight acreage analysis used in the voluntary Memorandum of Understanding (MOU). Metering is a technique that uses meteorological conditions and predictions to manage burning within the capacity of an air shed and may allow increased burning on specific days with minimal effect on people. As the Air Authorities and Ecology have determined how to predict when particulates will be disbursed by the wind, the number of allowable acres burned has increased. This information is used to make daily burn calls that define the quantity of allowable acres to burn in a given area. The metering generates information on the success of the burn and determines how the burn call avoided creating exposure impacts. In order to assure that health effects do not increase, the permit authorities must provide metering, data gathering, and annual reporting.²

² The annual report costs would be attributed to Ecology staff time. An estimate would likely be 1/10th of an FTE or 1/10th time for one person working full time: ~ \$10,000

WAC 173-430-040 (3) In this section, the burn permit application process has been amended to include a map requirement. This allows the issuers of burn permits to check the burn area more efficiently. As a result, the cost and time required to apply for a burn permit will increase.

WAC 173-430-040 (4) This section incorporates the maximum fee levels and the authority for fee level changes. The legislature established the authority of fee level changes to the Agricultural Burning Practices and Research Task Force. This section establishes fees set by the Agricultural Burning Practices and Research Task Force that remain below the maximum level by law of \$2.50 per acre. The fee will be maintained at the current level of \$2 per acre through 2007 and raised to \$2.25 from 2008 on. The increase includes the Ecology Administration Fee increase from \$0.25 to \$0.50 per acre in 2007 and 2008. Additionally, the Task Force has determined that the research component of the fee will remain at \$0.50 per acre in 2006, drop down to \$0.25 per acre in 2007 and then rise back up to \$0.50 per acre in 2008.

In addition, new fee maximums for orchard tear-out burning are incorporated. According to RCW 70.94.743, outdoor burning of cultivated orchard trees, whether or not agricultural crops will be replanted on the land, shall be allowed as an ongoing agricultural activity, given it has been determined in writing that burning is an appropriate method to prevent or control the spread of horticultural pests or diseases. The fixed fee for orchard tear-out burning permits of up to 20 acres will increase from \$25 to \$50.

IV. Affected Industry

The dominant economic impact will occur in North American Industry Classification System 111, Crop Production; however the following NAICS codes may be affected:

- 111 Crop Production
- 112 Animal Production
- 115 Support Activities for Agriculture and Forestry

Table IVa: Permitted Acres Burned by Crop Type³

Sum of ACRES	YEAR				
CROP	2002	2003	2004	2005	Grand Total
barley	820	4,477	2,567	2,388	10,252
beans	-	496	-	-	496
CRP	4,828	10,835	12,596	4,667	32,926
corn	-	116	430	1,893	2,439
grass cover	20	172	695	3,607	4,494
hay					
irrigated	151	2,255	1,864	1,868	6,137
dryland	-	-	45	56	101
oats	27	-	-	-	27
orchard	75	461	247	54	837
pasture	-	289	25	150	464
peas	-	-	617	-	617
spot burning	174	232	223	92	721
turnip - seed	-	30	-	-	30
weed control	54	28	154	128	364
wheat					
irrigated	7,223	16,580	24,593	76	48,471
dryland	72,705	228,726	242,985	100,377	644,794
Totals	86,077	264,696	287,041	115,356	753,170

The increase in burning will most likely not create an increase in particulate exposure or related health effects when burning is timed carefully. However, burning has the potential to affect 1.3 million people on days when the particulates will be brought to highly populated areas. Given accurate timing of the burn calls, data collection and analysis create the primary cost of the rule.

Sum of ACRES	YEAR				
COUNTY	2002	2003	2004	2005	Population
ADAMS	59		2,320	320	16,428
ASOTIN		73			20,551
CHELAN			20		66,616
COLUMBIA	31,424	109,793	114,045	46,705	4,064
DOUGLAS		695	160		32,603
FERRY				35	7,260
FRANKLIN	3,458	6,766	12,692	1,667	49,347
GARFIELD	60	17,236	16,598	11,565	2,397
GRANT	2,305	3,596	4,250	1,688	74,698
KITTITAS	70	264	277	50	33,362
LINCOLN	492	1,192	1,035	321	10,184
OKANOGAN		39			39,564
STEVENS			30		40,066
WALLA WALLA	27,372	72,946	68,038	18,964	55,180
WHITMAN	20,838	52,097	67,577	34,042	40,740
Grand Total	86,077	264,696	287,041	115,356	493,060

Table IVb. Permitted Acres Burned by County

The agricultural sectors affected by this rule are dominated by small businesses. Only 6% of the companies have over 50 employees and 53% have only 1 to 4 employees. The average firm employing less than 50 individuals has 9.4 employees.⁴ Thus, most of the companies

³ The raw data on applications contains duplicate applications. Applications also exceed final burn values. Ecology staff attempted to clean this data to avoid duplication on 3/21/06.

⁴ County Business Patterns 2003, Census Bureau NAICS 111.

benefiting from the additional flexibility in the burn calls will be smaller companies.

The permit data provides information on each burn; however it does not segregate out the costs or gains to individual businesses. The following data provides a summary of 4 years of activity on the part of individuals applying for permits.

Table IVc Individual Permit Data for 2002 through 2005

Applicant Permit Statistics: Fee estimates				
	Number of Acres	Number of Permits	Acres/permit	2008 fee increase (Based on 2005 numbers)
Total	753,170	6,005		\$28,839
Individual				
Maximum	70,045	91	770	\$2,715.75
Minimum	11	1	11	\$0.25
Average	1,407	5	286	\$70.91
Median	254	2	127	\$4.25

The majority of the costs of this amendment are imposed on government in the form of researching and documenting the burn calls and providing oversight. The cost imposed on agricultural businesses in exchange for this cost reduction small relative to the gain from burning. The costs include adding a map to the application and submitting a post burn report. The conservative cost of adding the map is \$19.44. When evaluated on a cost per employee basis there is a disproportionate impact to small businesses as seen in Table IVd.

Table IVd. Disproportionate Impacts Estimate for Maps

Disproportionate Impact	Cost	SB \$/Emp	LB \$/Emp
Employment Basis			
Industry Average	\$ 19.44	\$ 2.06	\$ 0.39
Public Data	\$ 19.44	\$ 2.56	\$ 0.06

In 2008, the fee for agricultural burning will increase from \$2.00 to \$2.25 per acre. The fees are increasing in order to cover the cost of reviewing atmospheric conditions and creating burn calls. The total annual cost of the fee increase is estimated to be \$28,000 in 2008. When evaluated on a cost per employee basis, the fees have a disproportionate impact as seen in Table IVe.

Public data on individual companies is limited to 17 out of 300 permittees. The fees have been evaluated with both the industry average and public data and it is suspected that calculations based on the industry average are more likely to be valid. If a company is an average small company and pays the average fee increase of \$71 and the 6% of large employers pay the same average fee, then the impact is disproportionate to small businesses. Small companies would pay on average \$7.51 per employee and an employer with 50 employees would pay \$1.42 per employee.

Table IVe. Disproportionate Impacts Estimate for Fees (Small vs. Large Business)

Disproportionate Impact	Cost	SB \$/Emp	LB \$/Emp
Industry Average	\$ 70.91	\$ 7.51	\$ 1.42
Public Data	\$ 70.91	\$ 9.33	\$ 0.23

The \$0.25 fee increase scheduled for 2008 is proportionate to acreage for all companies burning over 20 acres. Acreage burned is a function of crop type rather than number of employees. Acreage burned is highest for wheat and in following, wheat will pay approximately 93% of the fee. Eighty-three percent of the companies that will pay over \$50 more for the fee increase produce wheat. One company producing wheat is predicted to pay 5% of the fee. Peak employment within wheat and grains in 2004 was 847 in August while the annual average was 224. There are 1,278 firms in NAICS 111 and oilseed, grain farming and wheat constitutes 20% of the 1971 employees.⁵

As a result of the fee increase from \$25 to \$50 for orchard burning permits up to 20 acres, the impact is disproportionate with respect to acreage as well as employment. Those with burn permits for large acreage will have an average fee increase of \$6 where those with small burn permits will have an average fee increase of \$25 (see Appendix B).

V. Reducing the Cost Impact

Due to the voluntary MOU, burning had been reduced in half by 2000 in comparison with pre 1998 burning. However, burning increased over the last few years under metered burning (see Appendix C). As such, this amendment would have constituted a “method to reduce costs” under RCW 19.85.030 (2)(f). The amendments, taken together, should reduce costs for most companies.

RCW 19.85.030 provides several options for Ecology to reduce costs if it is legal and feasible to do so.

- (a) Reducing, modifying, or eliminating substantive regulatory requirements;
This amendment modifies the timing of burning and allows more burning.
- (b) Simplifying, reducing, or eliminating record keeping and reporting requirements;
It is not possible to eliminate substantive requirements related to permitting or burning. The legal requirements in RCW 70.94.650 require a permitting program be established. RCW 70.94.743 and RCW 70.94.745 detail exceptions. The 9th Circuit Court of Appeals Settlement is detailed. More record keeping including maps and post burn reports are required in order to allow increased burning without creating significant health effects.
- (c) Reducing the frequency of inspections;

⁵ Agricultural Workforce in Washington, 2004, downloaded 3/15/06,
https://www.workforceexplorer.com/admin/uploadedPublications/5435_Ag_Report_2004bdWE.pdf

It is not possible to eliminate substantive requirements related to permitting or burning. The legal requirements found in RCW 70.94.650 require a permitting program be established. RCW 70.94.743 and RCW 70.94.745 detail exceptions. The 9th Circuit Court of Appeals Settlement details additional requirements. Excellent compliance facilitates increased burning, which in turn lowers costs.

(d) Delaying compliance timetables;

It is not possible to eliminate substantive requirements related to permitting or burning. The legal requirements of RCW 70.94.650 require a permitting program be established. RCW 70.94.743 and RCW 70.94.745 detail exceptions. The 9th Circuit Court of Appeals Settlement details additional requirements. In order to allow more burning, an excellent understanding of the timing of burning is essential. Farmers may not be able to burn on the day that is most convenient, but they will be allowed to burn when it is safe to do so.

(e) Reducing or modifying fine schedules for noncompliance;

It is not possible to eliminate substantive requirements related to permitting or burning. The legal requirements in 70.94 RCW are detailed. Excellent compliance facilitates increased burning.

(f) Any other mitigation techniques.

This rule amendment constitutes mitigation in that it reduces the costs of the existing rule.

VI. Small Business Involvement in Rule Development

Ecology formed an advisory committee in order to include small businesses in the rule drafting phase. The advisory committee included four growers who represented specific crop types and/or grower organizations. In addition, at least one other advisory committee member is a grower although the interested represented was that of the Conservation District. Ecology uses several methods to inform growers including: a web-based information system (through LISTSERV), specific email coordination with delegated permitting authorities, Ecology Air Quality Program web postings for permit information and forms, and as time allows, presentations at various local meetings. Local Air Authorities also use a variety of methods including telephone assistance and web-page information.

Appendix A: Crosswalk for Rule Revisions, New Language and Legal Citations

Chapter 173-430 WAC- Agricultural Burning						
Section	Change	RCW Requirement or Reference / Current WAC Reference	Settlement Agreement Reference	Analysis Required	Explanation	
020(4)	Brings forward existing language that prohibits burning during an air pollution episode or stage of impaired air quality.	RCW 70.94.745; RCW 70.94.743; RCW 70.94.473; WAC 070(g)	None		Update rule with impaired air quality definition and other statutory changes from 1995 to present.	
020(5)	Permit and fee requirement	RCW 70.94.650(1)&(2) WAC 1730-430-040(3)-(4)	None		Existing RCW sets a fee cap, requires the Ag. Burning Task Force to set level and requires fee adopted by rule. RCW 34.05.328(5)(b)(vi) states rules that set or adjust fees or rates pursuant to legislative standards are not required to provide further analysis. The fee for this program meets this criteria. No further analysis is required.	
	Incidental Agricultural Burning	RCW 70.94.745	None		Existing exception	

030(1)	Include propane flaming as part of the definition of agricultural burning.	RCW 70.94.650 is only for those using burning for agricultural activities.	None	SBEIS CBA	Propane flaming has long been included in the scope of burning in related to agricultural activities. Differentiates between ag. and non ag. settings.
030(8)	Adds corporate equivalent	Current WAC lists IRS schedule (f).	None		Corporations do not file a schedule (F) Also reviewed USDA criteria for "farm" Far too complex to apply to this program.
	Deletes "ingredient" in agricultural process.	RCW 70.94.650 focus on agricultural activities	None	CBA SBEIS	Increased emphasis on crops that are or could be ingredients. Examples include bio-diesel and bio-mass; poplar trees for pulp.
040(2)	Includes a smoke management index component to the agricultural burning program	Meteorological conditions	Yes. B(2)(b) B(6)(b)	CBA	Settlement agreement asked Ecology to consider a standard. The advisory committee reviewed current procedures agreed a standard was not

040(2)(a)	Describes smoke management index	RCW 70.94.650(1)(c)	B(1)(f)		helpful. The group then developed a concept that captures current procedures. RCW provision indicates the types of conditions to implement the program: time of year, meteorological conditions, and other criteria specified in Ecology rules.
040(2)(b)	Describes conditions when procedures must to be followed.				
040(2)(c)					
040(2)(d)					
040(2)(e)	Ecology or local air required to produce an annual report				Currently, Ecology produces the report.
040(3)(c)(i)	Additional map application requirement.			CBA SBEIS	Lessons from enforcement and program implementation.
040(3)(f)	Permit decision criteria	RCW 70.94.650(1)(c) WAC 173-430-070	None		Existing language in both.
040(3)(g)	Must approve or deny based on	WAC 173-430-080(1)(a)	None	CBA	Review with Delegated

	information in permit application	Requires evaluate and approve or deny			Authorities and Enforcement lessons
040(4)((a)(ii)	Creates a minimum permit fee level for orchard burning tear-out permits Task Force approved	RCW 70.94.650(2) RCW 70.04.743(1)(d)(ii)	None		Increases fee from \$25.00 to \$50.00 up to 20 acres. RCW 70.94. Section 743(2)(d)(ii) allows permitting for orchard tear out regardless whether the land will be replanted as an orchard. Fee level is within statutory cap. No further analysis is needed.
(040)(4)(b)(ii)	Fee is increased in 2008 to \$2.25. Fee distribution between categories is changed. Task Force approved.	RCW 70.94.650(2)	None	SBEIS CBA	Fee levels are within statutory cap. No further analysis should be needed.
(060)(2)	Changes the research review to every two years from annually	RCW 70.94.650(4)	None		Reduced Task Force meetings and harmonizing research projects with state budgeting process.
(080)(2)(a) and (2)(b)	Adds map to completed application criteria	RCW70.94.650(1) RCW70.94.654		CBA	080 and 090 contain items that to delegation. These items are in current delegation orders.

(080)(7)(a)	Add dates by which funds are transferred to Ecology	RCW70.94.650(1) RCW70.94.654				Each is designed to solve a specific problem and improve both efficiency and effectiveness in both the education and enforcement components
(080)(7)(b)	Adds dates by which Ecology is provided with permit information	RCW70.94.650(1) RCW70.94.654				
090(9)	Post-burn report	RCW70.94.650(1) RCW70.94.654	B(1)(f)			
(090)(10) (a) &(b)	Permitting authorities must use the web-based database	RCW70.94.650(1) RCW70.94.654				
090(2)(e)	Delegated authorities must agree to periodic audits and reviews	RCW70.94.650(1) RCW70.94.654	B(1)(a)	CBA		Review for delegated authorities looks at performance based on, the delegation agreement, complaints received, changes requested, and noteworthy items for that area. Ecology and Local Airs are subject to several types of audits.

Appendix B: Orchard Fee Increase Estimate for Average Permit

Orchard Burning Permits	# Permits 2002	Ave. Acres 2002	# Permits 2003	Ave. Acres 2003	# Permits 2004	Ave. Acres 2004	# Permits 2005	Ave. Acres 2005	Baseline (Ave. # Permits 2002-05)	Baseline (Ave. Acres 2002-05)	Fee increase*	Increase from baseline Cost 2006	Increase from baseline Cost 2007	Increase from baseline Cost 2008	Projected total cost from fee increase
Total orchard tree-removal burnings	3		23		12		3		13			\$208	\$208	\$290	\$707
Removal up to 20 acres	3	1- >20	16	1- >20	7	1- >20	2	1- >20	8	1->20	\$25	\$208	\$208	\$208	\$625
Removal of 20+ acres	0	0	7	34	5	30	1	22	15	21	0	0	0	82	\$82

0.25\$* per acre
increase for 20+
acres in 2008

Appendix C: Reductions in Total Burning by County under the Voluntary Memorandum of Understanding (MOU)

		Adams	Asotin	Benton	Columbia	Douglas	Franklin	Garfield	Grant	Kittitas	Klickitat	Lincoln	Spokane	Stevens	Walla Walla	Whitman	TOTALS	
1998	Spring 98	692	0	0	28,253	0	0	2,293	0	0	0	6,000	0	0	6,458	26,665	70,361	
	Fall 98	5,184	3,255	1026	19,444	6142	7,303	6,807	1,511	0	0	10,663	0	73	17,476	80,701	159,585	
	Total	5,876	3,255	1,026	47,697	6,142	7,303	9,100	1,511	0	0	16,663	0	73	23,934	107,366	229,946	
	WAWG acre redistribution	-168	-94	-29	-1,371	-177	-210	-262	6,566	0	0	-479	0	-2	-688	-3,086	0	
	Redistributed totals	5,708	3,161	997	46,326	5,965	7,093	8,838	8,077	0	0	16,184	0	71	23,246	104,280	229,946	
	MOU Baseline (1)	5,672	3,161	997	46,326	5,965	7,093	8,838	8,063	0	0	16,184	0	71	23,246	104,280	229,896	
	50% County MOU Goal (2)	2,836	1,581	499	23,163	2,983	3,547	4,419	4,032	0	0	8,092	0	36	11,623	52,140	114,948	
99 - 00	Fall 99	2,523	615	913	12,376	2,569	6,101	200	3,672	29	0	5,093	13	0	17,987	40,611	92,702	
Year 1	Spring 00	894	0	0	33,244	942	50	2,936	335	0	0	1,999	0	0	15,481	19,276	75,157	
	Year Total	3,417	615	913	45,620	3,511	6,151	3,136	4,007	29	0	7,092	13	0	33,468	59,886	167,859	
	% reduction from MOU Baseline	39.76%	80.54%	8.40%	1.52%	41.14%	13.28%	64.51%	50.30%	base = zero	base = zero	56.18%	base = zero	100.00%	-43.97%	42.57%	26.98%	
00 - 01	Fall 00	2,224	0	15	14,279	289	4,902	0	1,791	35	0	2,422	19	0	16,620	46,694	89,289	
Year 2	Spring 01	1,030	0	0	34,263	723	0	8,846	740	0	240	1,925	0	0	20,081	41,059	108,907	
	Year Total	3,254	0	15	48,542	1,012	4,902	8,846	2,531	35	240	4,347	19	0	36,701	87,752	198,196	
	% reduction from MOU Baseline	42.63%	100.00%	98.50%	-4.78%	83.03%	30.89%	-0.09%	68.61%	base = zero	base = zero	73.14%	base = zero	100.00%	-57.88%	15.85%	13.79%	
01 - 02	Fall 01	1,242	0	0	12,435	0	3,705	0	1,801	0	0	1,085	0	0	16,534	18,816	55,617	
Year 3	Spring 02	0	0	0	23,357	0	0	5,115	200	0	0	589	0	0	14,170	10,206	53,637	
	Year Total	1,242	0	0	35,792	0	3,705	5,115	2,001	0	0	1,674	0	0	30,704	29,022	109,254	
	% reduction from MOU Baseline	78.10%	100.00%	100.00%	22.74%	100.00%	47.77%	42.12%	75.18%	base = zero	base = zero	89.66%	base = zero	100.00%	-32.08%	72.17%	52.48%	
02 - 03	Fall 02	1,406	0	0	10,958	0	3,313	60	3,414	0	0	920	0	0	15,939	22,464	58,473	
Year 4	Spring 03	300	0	0	24,218	227	0	8,754	325	0	0	340	0	0	10,303	8,608	53,075	
	Year Total	1,706	0	0	35,176	227	3,313	8,814	3,739	0	0	1,260	0	0	26,242	31,072	111,548	
	% reduction from MOU Baseline	69.92%	100.00%	100.00%	24.07%	96.19%	53.29%	0.27%	53.63%	base = zero	base = zero	92.21%	base = zero	100.00%	-12.89%	70.20%	51.48%	
03 - 04	Fall 03	3,363	80	0	14,235	0	8,319	1,113	4,638	0	0	2,071	11	0	23,138	20,586	77,554	
Year 5	Spring 04	464	0	0	20,709	179	15	7,622	457	0	0	151	0	0	11,322	15,491	56,410	
	Year Total	3,827	80	0	34,944	179	8,334	8,735	5,095	0	0	2,222	11	0	34,460	36,077	133,964	
	% reduction from MOU Baseline	32.53%	97.47%	100.00%	24.57%	97.00%	-17.50%	1.17%	36.81%	base = zero	base = zero	86.27%	base = zero	100.00%	-48.24%	65.40%	41.73%	
04 - 05	Fall 04	2422	0	0	17860	0	8016	1001	4586	51	0	1349	0	50	21547	24998	81971	
Year 6	Spring 05 **	425	0	0	17158	0	0	6841	110	0	0	364	0	0	7846	16135	48879	
	Year Total	2,847	0	0	35,018	0	8,016	7,842	4,696	51	0	1,713	0	50	29,393	41,133	130,850	
	% reduction from MOU Baseline	49.81%	100.00%	100.00%	24.41%	100.00%	-13.01%	11.27%	41.76%	base = zero	base = zero	89.42%	base = zero	29.58%	-26.44%	60.56%	43.08%	
05 - 06	Fall 05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Year 7	Spring 06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Year Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	% reduction from MOU Baseline	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	base = zero	base = zero	100.00%	base = zero	100.00%	100.00%	100.00%	100.00%	
	NOTES:	(1)	The MOU Baseline is the starting point for the % reduction determinations. These numbers are after the WAWG redistribution of acres to Grant county. The numbers are not updated to reflect corrected acreage from 1998 (the corrected numbers for 1998 are immediately above the MOU Baseline field).															
		(2)	50% County MOU Goal is one-half of the MOU Baseline number and is the goal to be reached at year 7 of the MOU															
		Interpreting the "% reduction from MOU Baseline":																
		If the percentage is a positive number it represents a decrease in acres burned.																
		If the percentage is a negative number it represents an increase in acres burned.																
		If the message "base = zero" appears it means that the base acres equals zero and therefore a percent change cannot be calculated.																
		The following counties were removed from this printout due to the cereal grain acreages for all seasons/years equaling zero:																
		Chelan, Island, Lewis, Okanogan, Skagit, Yakima																

Appendix D: Map Cost Estimate

Map Costs: Worst Case		
Travel time:	45	minutes
Additional copy/buying time:	15	minutes
Miles	10	
Cost per mile	0.45	
Rand McNally Map Cost:	\$5.36	(with tax)
Copy Machine cost:	\$0.08	(1 b&w page @ Kinko's)
Cost of Wheat Worker	\$ 9.50	per hour
Cost of time	\$ 9.50	
\$ cost	\$9.94	
Mapping cost	\$ 19.44	

Appendix E: Estimate of benefits and avoided costs

1. Agronomic Benefit: Per acre benefit of \$96.35 for re-crop (double crop) situations.
Acreage estimate (Grant, Franklin average burned acres) – 9,300
Estimate = \$900,000
2. Control of jointed goatgrass- 1 million acres of infested winter wheat in Washington,
Acreage estimate: 0.3 million acres of winter wheat. At the 2004 price of \$3.68 per bushel and average cost of \$3.00 per bushel, net revenue is estimated to be \$227,000.
3. Direct-seeding in conjunction with burning cost savings– Per acre savings of \$17.48.
Acreage estimate: 15,461 (Based on 10% no-till/direct seed method in conjunction with average annual burned acres in Eastern Washington based off Appenix C)
Estimate = \$270,000
4. Potential for bio-diesel production:
Pacific AgriEnergy LLC estimates that 120,000 tons of canola and mustard could be locally produced. This would equate to 31.5 million gallons of oil.
Estimate = potential profit of \$5.9 million.

Estimated value to Industry = \$7.3 million