Dryland Wheat Growers and the EPA Region X, Community-Based Columbia Plateau Agricultural Initiative (CPAI)

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I. Executive Summary

Note: The following information, except where cited otherwise, is a summary of information gathered through interviews with farmers and other stakeholders in the Eastern Washington State dryland wheat growing area during the summer of 1998.

Economic forces are the primary driving force behind farming ***innovation***. "Thou shall make a profit" is the cardinal rule according to farming activist Pat Tigges. Growers that cannot pay their expenses and debts fall prey to the continuing cycle of farm consolidations. The conservation of the "soil resource" is arguably next in importance. This is important to farmers with varying perspectives. Some want to ensure the monetary value of their land, others want to "to leave a legacy for my son", and some see themselves as stewards and want to preserve the soil for its own sake.

Innovators that ***adopt more environmentally friendly practices*** do so because they have "curiosity" and are "experimenting" with ways to balance economic realities with environmental goals and regulations. While all farmers are to some degree risk-takers, innovators are more willing to try unproven practices. There is typically a preliminary period when new techniques are tried on limited areas (i.e. test plots). This is often in conjunction with Agricultural Extension offices, and/or chemical and seed companies. Equipment is often borrowed, rented, or improvised initially. The farmers experiment on their own land first rather than leased acreage to

preserve their relationship with the owner of the land. Progressive framers wait until there is a degree of success with new methods, then they may move to incorporate them into their own practices.

Another factor driving farming innovators is their *fear of new environmental regulations*. Innovations are sought to help prepare farmers for the impact of possible future regulations (e. g., tightening air quality regulations from PM10 to PM2.5, new pesticide regulations, etc.). It is important to recognize that there are environmental tradeoffs, even with what are widely seen as environmentally friendly practices. For example, no-till while successfully reducing soil loss, requires significantly more herbicide use than conventional tillage.

Some of the ***barriers to the adoption*** of environmentally friendly practices such as no-till include the cost of equipment, complexity, and initial loss of production during the conversion. Other barriers include the reluctance of landlords to take risks (this is lessening due to lack of choices in an extremely poor commodities market), imported technology and crops that are unproven in the area (and its many microclimates), a lack of steady markets for alternative crops, and conversion problems. Conversion problems include a lack of knowledge (i.e., timing, rotations, unknown interactions), the period of soil reconditioning (the return of microorganisms, herbicide residue persistence), and toxic plant residues from prior plant rotations.

Information exchange among farmers is complex and involves overlapping sources, both formal and informal. Formal sources are quite extensive and include both institutional (government agencies, universities) and industry. Growers recognize that some of these sources have their own agenda or perspective, and their information is weighed carefully. Informal information exchanges are centered around “over-the-fence” exchanges between neighbors, but are by no means limited to them. There is an extensive network of farmers in the region, with many of them well aware of the practices of other individual farmers several hours drive away.

Overall, the ***farmers’ views of the EPA*** are positive, but with strong reservations. Personal interactions with EPA staff members were described as productive and positive when referring to specific projects, but was less favorable regarding meetings and hearings. There are reservations about the regulatory decision making process. There is a feeling that EPA meetings are often just briefings about decisions that have already been made. There is a concern that the opinions of growers and suppliers are not incorporated into the decision making process from the start, and that environmental groups have undue influence in the process.

A primary concern, to growers and suppliers alike, is the fear of new EPA regulations arbitrarily dictated upon them. The community is well aware of the power that EPA regulations have upon their lives. A concern repeatedly voiced, is the need for *fairness* in regulations and markets. The farmers have a fundamental desire for fairness concerning pesticide enforcement and regulation. They are willing to deal with some personal costs, as long as others in the global market face the same regulations and restriction. The growers are very concerned that due to a lack of controls on imported crops they are not on a “level playing field”.

II. Abstract

SfAA/EPA Environmental Anthropology Project:
Dryland Wheat Growers and the EPA Region X's Community-Based
Columbia Plateau Agricultural Initiative (CPAI)

The dryland (non-irrigated) wheat growers of Eastern Washington State are experiencing anxiety due to the low commodity prices of an increasingly globialized agricultural market. These market forces, in conjunction with environmental regulations, have created pressures that have encouraged many farmers to experiment with no-till agricultural methods. Local innovators are adopting new systems of production in an arid region that with traditional, conventional methods required the accumulation of two years worth of precipitation to grow a single crop of wheat. This paper summarizes an EPA/SfAA Environmental Anthropology Project internship with the EPA Region X, Columbia Plateau Agricultural Initiative (CPAI). Issues examined include: farming innovators adoption of environmentally friendly agricultural practices, barriers to adoption of environmentally friendly agricultural practices, the mechanisms of information exchange in the community, and farmers' views of (environmental issues and) the EPA.

Key words: farmers, innovators, no-till agriculture, environmental anthropology, EPA; Washington State

III. Introduction

During the summer of 1998, Frank Lucido participated in the Society for Applied Anthropology/EPA, Environmental Anthropology Project as an intern with the Columbia Plateau Agricultural Initiative. The Columbia Plateau Agricultural Initiative (CPAI) evolved from the EPA Region X emphasis on community-based management. This is an effort by the EPA to work directly with communities to identify and address issues in the context of community needs. According to EPA documents, "Ideally, the community takes the lead in identifying its assets and strengths and uses these tools to prevent or solve environmental degradation".

The EPA is interested in working with communities to reduce the social and environmental costs of agricultural activities, while maintaining or increasing the economic benefits of agriculture on the Columbia Plateau for the long term. Agriculture is a central economic and social force in this area. Lucido's role in the CPAI initiative is in this community-based work context, in an effort to provide EPA with some insights into the communities that they are charged with working with.

Dryland wheat growers and their were chosen as the subjects of the CPAI internship project, rather than other types of farmers of the area. This is for several reasons. First, dryland wheat is grown widely in each of the five counties of the CPAI study area, unlike the more geographically restricted irrigated crops. The dryland farming system is primarily wheat with a few alternative crops, and is less daunting subject than the vast array of irrigated crops grown. Pesticide and labor issues are also less variable. In other words, while still involving a very complex community, dryland farming is a more manageable subject for short-term fieldwork. Finally, this area is undergoing significant change.

Many significant environmental issues are addressed here—soil runoff, airborne particulate matter, water quality, habitat loss, adoption of more environmentally friendly practices—and may provide the CPAI team (and others at the EPA) with some insights to aid their efforts at community-based management. Based in the eastern part of Washington State in Ritzville (county seat of Adams County, population 1,800), Lucido worked closely with his Seattle based EPA contact, Karl Arne, Ph.D., pesticide specialist. Through interviews and other data, the research goals for Lucido's internship were to identify community defined issues and needs, especially within the context of environmental issues. This research explores issues such as: innovators using more environmentally sound agricultural processes, barriers to adaptation of environmentally friendly agricultural practices, mechanisms of information exchange, and how farmers view environmental issues and the EPA.

EPA statements summarized from: *Columbia Plateau Agricultural Initiative: An Initiative to Assist Local Communities* 10/24/97, and the draft report of *Columbia Plateau Agricultural Initiative Listening Tour* 8/31/97.

Geographic Setting

The study area for the CPAI is a five-county area of the Columbia Plateau in Eastern Washington State. This encompasses Lincoln, Grant, Adams, Franklin, and Benton Counties. Bordered on the south and east by the Columbia River, the Columbia Plateau region is one of grassy volcanic hills with vast expanses of dryland wheat cultivation, with more limited areas of center-pivot irrigation.

There is a moisture gradient in the CPAI study area. It is driest in the southwestern corner near the Tri-cities (Pasco, Kennewick, and Richland), and is less arid in the eastern portion of the study area, west of Spokane. Precipitation east of the rain shadow of the Cascade is 7 inches annually, increasing to approximately 16 inches in the eastern edge of the study area (Williams et al. 1998:5). Agricultural extension economist Jon Newkirk summarizes the conventional farming in the CPAI as highly mechanized and capital intensive with a heavy reliance on fossil fuel and chemical inputs, which produce wheat yields that are considerably above national averages.

Significant environmental problems in the dryland wheat growing region—according to CPAI members, WSU extension agents and documents, farmers, and other stakeholders—include: air pollution in the form of dust from soil blowing off of fallow fields, water erosion of exposed soils, habitat destruction due to cultivation practices, and pollution of surface and groundwater by agricultural pesticides and fertilizers.

Methodology

There is a growing realization among regulatory agencies that most environmental problems are human problems. The primary contribution of anthropology in this context is *social*

knowledge as provided through participation observation and key informant (consultant) interviews, which are used to create an ethnographic account (Finan et al. 1991:1). While applied anthropologists acknowledge "short is never better", even short-term projects may produce useful qualitative data for decision making. The field of applied anthropology itself is moving in the direction of planning at the community level, and this fits the needs of clients such as the EPA that are actively seeking to develop community-based management abilities (Molnar 1991: 11).

Participation observation is aimed at gaining understanding from the insiders' viewpoint. Lucido conducted participant observations while residing in a farming community in the study area. Lucido attended on-farm demonstrations, a hearing on pesticides, took tours of farms, rode along in combine cabs, and had many other interactions with community members.

Key consultant interviews were conducted with a variety of community members of groups that are stakeholders in EPA decision making. Approximately 25 interviews were conducted, one-half with farmers and spouses, and the rest with a variety of farm service related community members. In total, there were over 60 hours of interview data collected. Informed consent was obtained through though a statement made by Lucido to consultants (see endnote i). In the following sections, unless otherwise noted, quotes are from farmers interviewed in the course of this study. Other stakeholders' comments note the source, e.g. "a fieldman stated".

The questions were based on information collected on an springtime preliminary trip to the area by EPA/SfAA intern Frank Lucido, EPA Region X contact Karl Arne, and SfAA mentor William Loker, Ph.D., California State University, Chico. Important issues were elicited at meetings with CPAI team members, Washington State University (WSU) extension agents and researchers, key consultant interviews with farmers, and background documents from a variety of sources including: the EPA, USDA, WSU, agricultural extension, newspapers, and agricultural industry publications.

Lucido conducted formal face-to-face interviews with farmers, which were structured with an interview guide of thirty questions. The interviews ranged from one to eight hours in total length, with an average duration of approximately two and one-half hours.

Informal face-to-face interviews were conducted with a variety of other community stakeholders. These included a bank vice-president, an insurance agent (crop/farm), a coop manager, a farming rights advocate, an aerial sprayer, an equipment dealer (machinery), an chemical company "fieldman" (input dealer of pesticides and fertilizers), several Washington State University agricultural extension agents and researchers, a conservation district member, a soil conservation service member, and others.

As the Columbia Plateau Agricultural Initiative (CPAI) intern, Lucido did face the challenge of interviewing farmers during harvest season. For many growers this is a time of dawn-to-dusk work, lasting for three or four weeks. The growers interviewed were informative and generous with their very limited free time. Many of the growers contacted by Lucido were willing to be interviewed, but did not have time to do so until after the summertime harvest. Lucido took care to avoid fostering the impression that "the EPA does not know enough to wait until after harvest to contact people." This was a complaint voiced about EPA meeting schedules. It was explained that due to the time constraints of a summer internship, this was the only time available for such research. Most of the farmers (and others) contacted had a positive impression of this effort made to listen community members concerns, and called for more such contact and trust building between local communities and the EPA.

The original list of farmer contacts was provided by WSU extension agents. This list was expanded as each contact was asked to provide more potential consultants. While contacting busy community members during harvest was difficult, it was important for Lucido that he offered an opportunity for community members' views and opinions to be heard by the EPA. Some themes emerged and concerns were voiced, and they may provide some useful insight to the EPA CPAI team, and other interested parties.

Categories of Farmers

The categories for this study were designed to portray some of the diversity of farms and farmers in the region. Three categories were devised: *farming practices, agro-ecological zones*, and *farm size*.

Farming practices are categorized here as conventional (monocrop wheat, summer fallow), progressive (minimum tillage, no-till, alternative crops) and innovator (On Farm Research, leader in new methods). The agro-ecological zones, as defined by annual precipitation amounts, were also divided into three categories: less than 9 inches, 9-12 inches, and greater than 12 inches of precipitation. Farms in the area were divided into three size categories: less than 2000 acres, 2000-5000 acres, and over 5000 thousand acres. The farming practices and farm size categories were devised from information gathered from farmers and extension agents. The agro-ecological zones were devised from a precipitation map in Williams et al. (1998:6).

While this study did not use a strict random sample methodology, a variety of growers (from the above categories) were included in an attempt to address the range of different community members' needs and concerns. Interviewed were farmers with small 1300-acre farms and those with 5000 plus acre operations. Conventional, progressive and innovative farmers were all represented, although some growers were variable in their practices from year-to-year. A variety of agro-ecological zones were also represented, from the less than 7" of annual precipitation in the Horse Heaven Hills (southwest part of CPAI area) to the over 16" received near Spokane (northeast part of CPAI area).

IV. Observations

Note: Farming practice descriptions are from interviews with farmers, extension agents, and others. Quotes are from farmers except were noted.

The CPAI area is arid, with the much of the precipitation falling as snow. Efforts to capture this melting snow in the soil have resulted in the distinct agricultural practices of the area. In the conventional agricultural methods employed in the area, the loess soils are repeatedly tilled to create a several inch thick layer of "dust mulch". The bare land is then left fallow for a season to collect moisture.

While these practices are designed to collect and retain the two years' worth of moisture required to grow a single wheat crop, they do have environmental and human health costs. These impacts include soil loss—due to water runoff and the loss of fine particular matter in the air as dust—which threatens the sustainability of agriculture in the area. The particulate matter in the air is potential human health threat, a major concern to the urban populations in the region, such as Spokane and the Tri-cities (WSU: 1994a). Wildlife and fisheries habitat destruction due to the

enormous scale and thoroughness of cultivation (road-to-road planting), and pollution of surface and groundwater by agricultural chemicals—about 20% of the wells in the Columbia Plateau have elevated nitrate levels (Williams et al. 1998:6).

There is a trend of farmers on the Columbia Plateau moving toward minimum tillage and no-till methods. This innovative trend is due to a complex interaction of regulatory forces and market trends. Many growers that experimented with no-till practices in the 1980s went bankrupt, which has left many in the region highly skeptical of this approach. However, these are desperate times and growers are anxious to find some way to remain in farming. The innovators in the region are importing no-till methods from the Midwestern U.S. and other areas, and are attempting to employ them on the arid Columbia Plateau.

There is a great deal of grassroots innovation in the area, with farmers frequently heavily modifying existing farm machinery and creating no-till equipment suited to their own needs. In another example of innovation, an otherwise conventional wheat farmer (Harold Clinesmith) developed a method of deeply "grooving" the soil with a homemade device that shows great promise in efforts to divert surface flows of water into shallow ditches and into the subsoil.

Alternative Crops

The incorporation of alternative crops is key in efforts to move to no-till, and away from conventional monocrop winter wheat, summer fallow methods. The alternative crops are a critical component in breaking disease cycles traditionally dealt with through extensive plowing. Alternative broadleaf crops (e.g. mustard seed, canola, safflower) are rotated with the conventional grass crops (i.e. wheat). However, incorporating alternative crops is difficult due to several factors including: limited markets for alternative crops, unknown interactions between the different crops, a lack of approved pesticides, and reluctance of landlords to take risks. Several farmers also cited difficulties in getting crop insurance. An insurance broker stated that although he had insured some alternative crops, he thought that the farmers "had not come up with any that will work (economically), that they were fooling around with new crops, and they do not stick with them". The same insurance broker stated that there was no difference in insurance coverage between no-till and conventional agricultural methods.

No-till

No-till (often referred to as direct seeding) and minimum tillage methods offer several benefits to the grower. Economically advantageous to the farmer are the lower costs (e.g. inputs, fuel) from the fewer number of passes over the fields. The Jirava farm has about one-third of its acreage in no-till. The rest is in reduced tillage and only requires two or three passes versus their neighbors' seven passes (on conventionally tilled land). With no-till, there is income from harvests every year (although the per-harvest yield is lower) as opposed to conventional agriculture's every other year harvest. This continuous (every year) cropping is termed recropping. Continuous cropping may, however, create a higher fire risk due to the elimination of the vast fire brakes provided incidentally by the fallow fields of conventional agriculture. This is

especially important in the lowest precipitation areas. With no-till there is a significant reduction in soil loss through blowing and runoff, which preserves land values. Growing alternative crops as a part of the rotations is also a way to diversify farmers' investments. The stubble that is left (instead of plowed under) may help collect moisture from snow, aid in the return of helpful soil biota, and the holes left by the roots of alternative crops aids soil aeration.

Some difficulties for farmers attempting to convert to no-till crops include: the reluctance of landlords to take risks, increased herbicide use, the expense of new machinery (in the hundreds of thousands of dollars), the learning curve for new practices, uncertainty over the water collection from snowfall verses the traditional dust mulch method, and the problems with the alternative crops mentioned above. Although some growers stated that market and regulatory pressures had nudged them toward minimum tillage and no-till practices, others think that "There is a time to take risk and this is not it, the wheat price is too low".

Landlords concerns were frequently cited as a reason that growers were much less likely to experiment with more environmentally friendly practices (e.g. no-till) on rented lands. This is because the land is often leased with a percentage of crops given to the landlords as payment. Landlords tend to be older and are frequently retired farmers. These landowners are less inclined to take risks with unproven methods. No-till methods, at least initially, have a lower bushel-per-acre return. Growers are concerned that the low rates of return to landlords could jeopardize their access to the land. One very well regarded grower that has successfully convinced his landlords of the economic viability of no-till, is described as treating them as his "board of directors" by keeping them fully informed of his practices. The landlord/farmer relationship is a complicated one, frequently intermingling family and financial interests.

Some insights into this landlord/farmer relationship were provided by banker Richard Hayes. "I would estimate that about 10% of tenants, who are not related to their landlords, are close enough to try no-till. (This figure) may be increasing out of (economic) necessity. Roughly, 60-70% of landlords live within 100 miles of the dirt (that they own), and the remaining 30-40% are absentee and visit once a year, if that. This group will be approachable for about the next 10-15 years, but the next generation (of heirs to the land) is a question."

Markets

According to WSU agriculture extension economist Jon Newkirk the Asian market is very important to Washington farmers. Up to 65% of the Eastern Washington wheat crop is exported there, with Pakistan constituting the largest single purchaser. Banker Richard Hayes explained that "The protein content of our wheat is desirable to markets in the world's hot spots like the Middle East". The economic sanctions that the Pakistani's faced after they detonated an atomic bomb in the spring of 1998, was front-page news in Ritzville and was frequently mentioned by growers. The farmers of the region are painfully aware of the global nature of the markets for their crops. Economic embargoes and political sanctions placed on grain consumer can be very harmful to the growers' bottom line. So can economic downturns in foreign markets. "We can ride a year out, but (the prospect of) five or six years of Asian (economic) crisis is kind of scary." Wheat grown in foreign markets is another threat. Farmers feel that growers in other countries, e.g. Argentina, have lower costs and fewer environmental regulations. The Washington farmers

are concerned that if the "EPA is concerned with food quality they should look much closer at pesticide residues on imported crops".

Farmers sell their crops in a varying mix of preset contract agreements and selling at market prices. Many farmers hedge against market extremes by selling some of their crop in each way. Contracts are frequently sought for alternative crops before they are grown. For example, mustard seed contracts with companies like French's are very desirable because there is a limited demand for the crop on the open market.

Farm Bill of 1996

The Federal Agriculture Improvement and Reform Act of 1996, referred to as the Farm Bill of 1996, has had a huge impact on farming practices. While a full discussion of all of the issues involved is beyond the scope of this paper, this brief overview examines some of the points relevant to this paper. The intent of the Farm Bill of 1996 was arguably to reduce subsidies and increase global competitiveness of U.S. agriculture. The results are even more economic pressures leading to continued farm consolidations and reduced protection of marginal lands under the Conservation Reserve Program (CRP). There is also a trend toward farming innovation, as exemplified by increased interest in no-till.

The Farm Bill of 1996, officially the Federal Agriculture Improvement and Reform Act of 1996, greatly restricted farm subsidy payments for the CRP. The CRP "protects highly erodeble and environmentally sensitive lands with grass, trees, and other long-term cover" (Newkirk:1996).

Roger Veseth (1997) summarizes the impact of the Farm Bill on no-till and minimum tillage practices on the Columbia Plateau:

> For decades, U.S. Farm Bills have been major obstacles to successful no-till and minimum tillage systems in the Northwest and across the country. Commodity program restrictions largely locking Northwest dryland growers into short crop rotations in order to maintain their wheat base acreage, and high proven yields for winter wheat. To help maintain to help manage weeds and diseases, they were forced to rely on intensive tillage. When growers began in the 1970's to explore direct seeding their traditional 2-Year rotations with winter wheat, many experienced reduced yields or crop failures due to soil borne diseases and winter annual weeds. At that time there was also little research based work or grower experience to guide growers in managing these new conservation tillage systems. Since then, great strides have been made in management technologies for direct seeding. With the 1996 "Freedom to Farm" bill, growers now have more cropping flexibility to develop proper rotations critical to the success of direct seeing and other man among to which systems. Now is the time to seriously began exploring new options for crop rotation, equipment, and management technologies for direct seeding or other minimum tillage systems.

The Farm Bill of 1996 has encouraged/forced many farmers to try alternative crops and minimum tillage. When asked if the reduction of farm subsidy payment affected their farming practices, the following responses were given by farmers:

> "Absolutely, (we are) getting away from influences (that were) mutating our rotations. We were farming subsidies rather than crops suited to soil. It distorted the

market."

"(We) looked more at alternative crops, so we do not have all of our eggs in one basket."

"Not really, but we are moving to direct seeding which is more efficient. So, indirectly it does."

"It makes it possible to recrop because now we do not have to grow barley (which did poorly)."

"It pushed me to no-till, and to find profitable crops. It has encouraged me to innovate."

Another area of farmers' concerns regarding the Farm Bill is that, "it was supposed to make U.S. agriculture more competitive, but is hurting family farms through *consolidations*". "With increased input costs, more regulations for salmon, air and water quality, and less assistance from the USDA, there is a decline (in the number of farmers) that will be difficult to recoup." The Freedom to Farm Act is also referred to as the "Freedom to Fail Act" by some in the farming community.

According to a chemical company fieldman, changes due to the farm bill have affected their business. Land that was out of production (in CRP) generated little money for farm supply dealers, so the reduction of CRP land is positive in this regard. There are negative impacts as well. With no cushion from subsidies, the chemical companies' "customer base has been reduced by consolidations because of low commodity prices. There are fewer dealers and (equipment) manufactures. Chemical company representatives are nervous, the land will still be farmed (after consolidations), but it may be someone else (who is not a customer). There could be a reduction in inputs used, and some would argue now is the time to do so." For some farmers it is a time to innovate, but others believe "it forces farmers to make desperate decisions to keep farm, and make less environmentally sound practices".

Suppliers

Growers purchase much of their inputs (e.g. fertilizers, pesticides, fuel) and farm equipment from within a 50 to 60 mile radius. Although for most "even fifty miles (to buy supplies) is tough to deal with on a day-to-day basis." A common response of farmers was, "I try to buy locally, but we are often forced to purchase outside immediate area to save money. There are fewer suppliers in communities because of farm consolidations which has led to a reduction in the number of farm suppliers. Because of this farmers have become even more susceptible to problems such as the last UPS strike. "A broken part during harvest can bring a farmer's whole operation to a halt."

There are *social costs* from farm consolidations. With fewer farmers supporting fewer businesses, prices increase and selection decreases. Community members end up shopping further from home to save money. "Many downtown storefronts have gone empty" as a result. Shrinking populations caused by the consolidation of farming support services, which require fewer workers, threaten the identity of small towns all over the Columbia Plateau. Pat Tigges suggests that two main symbols of the small communities' identity, the local high school and

post office, are crucial to a town's sense of place. The market forces that fuel consolidations are outside of the EPA mandate, however, there is some sentiment that the EPA actions have influenced the trend. "Towns are dying, and there is a consolidation of coops. EPA regulations are pushing everything toward bigger businesses. Costs of doing business are skyrocketing and eliminating competition by pushing small operators out of business. When the Benge gas station closed, the town lost three full time jobs. Only large operations can afford the costs of approved gas tanks and insurance." One candid comment that is relevant to the EPA community-based management effort was that "Technically maybe much of this land should not be farmed, but if it is let it go (back to its natural state) we will lose these communities".

Organizations, Information and Influences

Examining farmers' memberships in organizations is a way to understand their connections to the larger community, as well as the flow of information of farming practices. The farmers interviewed belonged to the following organizations: local coops, local Grange, the Farm Bureau, various commodities groups/commissions (Washington Association of Wheat Growers, Seed Oil Commission, Washington State Canola Commission, Washington Barley Commission, US Grain Council, Lind/Adams County Crop Improvement Association), and the ACIRDS group (Annual Cropping, Intense Rotation, and Direct Seeding). The commodities groups and commissions place a voluntary "tax" upon their members for market development and advocacy.

The ACIRDS group is a local grassroots organization seeking to employ the methods developed in South Dakota by Dwayne Beck. As spell out by ACIRDS members, this method uses an "intensity/diversity matrix" designed to imitate natural plant mixes (and distribution). This practice uses rotations of cold (e.g. wheat) and warm grasses (e.g. corn) with a broadleaf crop to break the disease cycle. Some of the followers of this method may be described has having been converted, and they have an unusually strong faith that these imported techniques are suitable for the dryer Columbia Plateau. Members of the ACRIDS members are respected leaders in the farming community, and it will be interesting to see if they are successful in the long term.

The list of farmers recommended as contacts by agricultural extension agents may have tilted the responses, to the question of farmer information sources, toward those that are more frequently in contact with extension agents. However, it is apparent that there are many other avenues of information exchange beyond the extension office, and the other institutional sources. These information sources are primarily industry related and include suppliers (include coops, chemical companies and equipment dealers), commodities groups, and industry publications.

Well regarded sources of information for farmers include: other local farmers, soil conservation districts, local chemical company representatives (fieldmen), Washington Wheat Growers' Association (and other commodities groups), local Granges, WSU (and Idaho State University) extension agents and their field stations, field days, and On-Farm demonstrations (including the remarkably admired Wilke farm, near Davenport), various extension, industry and institutional conferences (e.g. the Wheat Grower Association convention), the Internet, Data Transmission Network (a direct satellite service), the ACRIDS group, Cattleman's Association, and industry publications (e.g. No-till Magazine, and various Capital Press publications).

Intertwined with farmers' sources of information and memberships in organizations are the significant influences affecting farmers decision-making. These influences include: coops,

chemical companies, soil conservation districts, the Washington Association of Wheat growers, neighbors, WSU, the federal and state government, the community as a whole, and older farmers who are seen as particularly important as "people turn to them in hard times". The general population (especially the large urban population) is perceived by farmers as heavily influencing government agencies' regulatory decisions. "People in cities like the Tri-cities and Spokane influences air, water, pesticide issues which influence no-till decisions." The recent dramatic restrictions placed upon the burning of grass seed fields in Washington State were a frequently cited example.

Farmers were asked "How much concern of environmental impacts influence their every-day decision making process". Rated on a scale of zero to ten (with ten being a great influence on every decision) farmers' responses averaged slightly over eight. This indicates that environmental concerns have a very large influence on the decisions made by the farmers interviewed.

Farmers and the EPA

Overall, the growers described their feelings regarding the EPA as positive, but with significant reservations. Personal interactions (when present) with EPA staff members were described as productive when referring to specific projects, but was less favorable with regard to meetings and hearings. There are reservations regarding regulatory decision-making. There is a general feeling that EPA meetings are often just briefings about decisions that have already been made. There is a concern that the opinions of growers and suppliers are not incorporated into the decision making process from the start, and that environmental groups have undue influence in the process.

An common theme voiced be nearly all of stakeholders interviewed, were calls for the use of *sound science* in the decision making process. This invokes the issue of scientific relativism and the manipulation of data. While the resolution of these issue are not offered here, it is significant to note that there *is* common ground in the general acceptance of the scientific method. It is the question of the perceptions in respect to data interpretations and the scientific procedures employed that need attention. There is a strong feeling among farmers that the pesticide and fertilize "application rate estimates used to create regulations are unrealistic". "They need to look at actual farming practices to measure the levels of inputs applied on fields."

There is a sentiment among farmers and other stakeholders that community-based outreach efforts—such as the CPAI's listening tour to the area, and fact gathering missions such as this internship study—are useful for establishing communication between community members and the EPA. There were concerns voiced that the EPA (as an organization) has been out of touch with, and is in some ways insensitive to farming realities. "This kind of project is good and constructive. There are no quick fixes, you cannot just throw money at problems." A coop manager said, "That is the right direction. Talk with people who have lived here a long time to find out their history, values, likes and dislikes, and to find out what is important to the communities' success. It is a good start, listen and learn."

There is a concern that regulatory agencies' objectives are elusive. The EPA's efforts at community-based management need to be aware of these concerns. In response to questions of opinions of community-based efforts, one farmer responded that he was "encouraged by it, but I am frustrated. I dealt with (another agency and issue) that went to conflict resolution and seemed settled. I was frustrated when it became a *moving target*, with changing (agency) mandates and

personnel. It wears you down through attrition. Farmers do not have the time and resources to deal with that."

The following comments are representative of farmers' responses to the question, What could the EPA do to benefit you and the area:

> "They need more personal contact by hands on people to understand why you did as you did."
>
> "More seed money for Wilke farm (type of project). I find their concern about level of understanding (between the EPA and farmers) psitive, I am not sure that they understand the economic pressures regarding how we can move toward environmental friendly practices. There is a lack of communication, and problems over 'turf' between EPA, USDA, Fish and Wildlife, and others."
>
> "The EPA should do what we cannot do for ourselves, (e.g.) water testing for nitrate levels. Most farmers fear EPA as a watchdog out to get them. Although I have not had a fine, I think it is important to note differences between wrong doing and accidents."
>
> "They have one plan to fit everything. They need mini-watershed plans."
>
> "What good are pesticide regulations if they do not take into account their effectiveness."

Farming community members frequently called for "*local control*". When pressed for an answer, this was described as "Don't dictate, understand. Share BMP (Best Management Practice) first, then regulate with enforcement if needed". There is a feeling that through *peer pressure* the communities can control the behavior of growers. There is peer pressure to have "clean" weed free fields. "Farmers try to keep landlords happy. They will experiment on their own land first, often in out of sight locations. People will call and tell them when their field does not 'look good'. They do not want to rock the boat and risk loosing their lease." However, a coop manager said that he had some clients that ignore this pressure and take a different approach. "They are not out to kill weeds, just make them sick enough so that they will not hurt their wheat." Peer pressure was also cited as the reason that some growers expand too much and make themselves vulnerable by the accumulation of excessive debt. "Many farmers expand their land holdings so that they do not have the stigma of 'just taking over their Daddy's farm'."

Neighbors

Farmers' decisions are not made in a vacuum. These decisions have important impacts upon environmental health. Neighbors pay close attention to what growers around them are doing. A grower said that his neighbor had "CRP (Conservation Reserve Program) problems, they had no annual weed management. We still have a weed encroachment problem." Another farmer had neighbors that use "uncovered grain trucks which spread cheat grass" forcing him to increase his herbicide use. Some of these neighborly interactions are seen as mutual. "We get each other's erosion." Other times the interactions are seen as decidedly one-sided. "We use water conservation practices like planting grasses and terraces, but our neighbor's water drains on to our farm. This does give us more moisture, but it leaches our fertilizer. I tried to get him to take care of it. Eventually he may be subject to non-point source (pollution) regulations."

Pesticides

The issue of neighborly relations becomes especially important when it comes to pesticide issues. Pesticide drift is much more of a problem for growers trying alternative crops because herbicides used on grass crops like wheat attack broadleaf crops like canola. “We have a problem with their pesticide drift, . . . they will end up buying (our) crops (due to drift). This was not a problem when everyone used conventional (practices).” “They don’t pick conditions well for spraying, we pay attention to what and where they spray . . . due to our sensitive (alternative) crops.” Some growers are attempting to address the problem through communication. “I provided them with maps of my canola crops for their aerial spraying.” The problem goes both ways and some growers are resentful of the extra precautions that they have to take for their neighbors. “The irrigated farmers are very concerned with my herbicide drift. This is a big issue in (Benton) County, and aerial spraying is outlawed. The irrigated farmers will sue for damages, even without proof, to keep up the pressure on us.”

Pesticides can be undesirably mobile, and this is a hot topic in areas undergoing urbanization. “Several people have approached me asking to buy parcels of my land to build houses on. I will not sell to them, because no matter what they say up front, they will complain about the dust and pesticide use later. I do not want this to bring more restrictions upon me. I burned down the houses on the land that I have taken over, and plugged up the wells to get rid of the problem.”

A chemical company fieldman described one incident where a form of local control was applied to control a pesticide problem. The example cited was the creation of voluntary rules, in a case that addressed the use of a herbicide to control the Russian thistle. There was a great deal of public outcry when a hunter was exposed to the herbicide. In a forum setup by WSU, a set of voluntary rules were developed which included posting fields, and setting up buffer zones near schools and population centers.

According to a fieldman, chemical companies are taking a more proactive approach in dealing with environmental issues. In the current regulatory climate, they see this is the only way to stay economically viable. For example, closed pesticide systems where workers do not directly handle pesticides because they are enclosed in containers that are recycled. According to the fieldman chemical usage is now “greener” and has lower toxicity, use rates, leaching, and persistence in the environment.

The Russian thistle pesticide issue illustrates how concerned farmers and input suppliers are over the influence that public concerns and perception have on regulatory agencies. The preemptive move to setup voluntary rules was intended to avoid a regulatory solution. There is a worry among the farming community that “the public does not see the big picture”. “There is a lack of understanding by the general public of agriculture and natural resource issues as a whole. *Special interest groups* have the ability to sway public opinion. For example, stopping grass seed growers from burning their fields is good for air quality, but bad for water and soil.” Farmers see this focus as too narrow, and are concerned that farming is not weighed heavily enough in regulatory decision making processes. “Concerns about water and air quality will drive everything.”

The farmers have a perception that there is a lack of fairness and that rural and urban populations are treated differently by the EPA:

> “Lincoln County was targeted (for enforcement) because it is a large area with a small population and voice. We need cooperative efforts and working agreements. Landowners are willing to participate in habitat improvement projects, however, need funding for no-till research to address PM10 and clean water.”

"If Spokane households would spend $4,000 per house with septic systems (to reduce nitrate pollution of groundwater), I would not have to spend an extra $15,000-20,000 per year to reduce my levels."

"I have to take classes to use chemicals that are widely used in cities."

Many farmers perceive the public pressures on the EPA to regulate pesticide as a threat. Some growers are convinced that there is no need for regulations. "I avoid pesticide spraying and use herbicides sparingly." "I pay careful attention to where and when I spray."

Some farmers see regulations simply as a threat to the "tools" that they have at their disposal:

"Pesticide regulations are not a big problem, but it could be in the future with alternative crops due to the loss of options. We will have storage problems with the elimination of organophosphates."

"Organophosphates are seldom used, but we really need them when we do."

"I have only used insecticide once or twice in thirty years, but they were crucial then."

Other growers see pesticide regulations as a greater threat to their livelihood:

"Pesticide regulations have a great influence on the viability of new minimum and no-till practices. The availability of (effective) pesticides affects efforts to move away from (monocrop) wheat."

"I am fearful of the loss of Round-up . . . (which) allows no-till and minimum tillage (practices)."

"Round-up is a huge part of no-till."

"There is a perception that if they (the EPA) take organophosphate and carbamates they can take others, and that will end wheat production (in the region)."

Ultimately this is an issue of economics. "This spring I didn't use any herbicides, they are too expensive."

There are *tradeoffs* when restricting pesticide usage. "It will require more tillage (for weed control) which will cause more dust." Such environmental dilemmas are face by farmers everyday. "(Do I) use a light aerial spraying (and risk pesticide drift) of small amounts of herbicides when weeds are young, or wait to use greater amounts with a ground spraying when the weeds are older and add even more pesticides to the environment?" "No-till methods require several times more herbicide use than conventional methods. It is tradeoff of pesticides verses soil runoff and dust."

Farming community members were asked what they would like to see the EPA do to aid them with pesticide issues. Farmers, coops, and chemical company people all noted that pesticide regulations have added more business expenses for the required record keeping. The comments included:

"(We need) regulatory relief for *minor crop pesticides*. We have very limited tools to try alternative crops."

"The are huge problems with pesticide registration for minor crop use, and even wheat is considered a minor crop."

"The emergency pesticide waver program is too slow for alternate crops."

"I resent the time it takes to bring chemicals to market. Safety is important, but there is overkill (by the EPA). I need tools to farm with."

"The EPA needs to go out to farms and look at actual application rates, not just

rely on excessive estimates."

V. Summary

There are powerful forces at work bringing about changes in dryland wheat farming in Eastern Washington State. The continuing consolidation of farm holdings has been accelerated by the Farm Bill of 1996. Farmers are concerned about the "continued consolidation and extremely large farm trend". Urbanization is a continuing trend that concerns farmers along with its counterpoint, the shrinking populations of the small towns. "The more built up the Tri-cities are, the more problems with environmental regulation there are going to be (for farmers)."

A farmer neatly summarizes recent changes on the Columbia Plateau, noting that "no-till has gotten a serious look in the last three years, along with crop rotations and continuous cropping. I have noticed a lot less dust." These are environmentally desirable trends, although not without costs of their own—both environmentally and socially. On a cautionary note, several farmers noted that although there has been a recent period of heavier than average precipitation favoring no-till innovation, "If the weather changes, we may not be successful in the move to no-till".

Environmentally friendly agricultural practices are spreading because "growers are taking serious steps to reduce amount of erosion. They want a big reduction because they hate to see the ground flow." Some farmers are taking a proactive approach fearing that "we may have no-till forced on us by the EPA" to address unhealthy levels of dust in the air. Growers are also concerned about future pesticide regulations and "more non-point source pollution regulation" to address water quality issues.

Growers may be described as cautiously optimistic about their (and their families) possible future in farming, scoring a little over five on zero-to-ten scale—with zero as "extremely pessimistic" and ten is "extremely optimistic". Some farmers see technical solutions (echoing the "Green Revolution"), such as genetic engineering and the development of "Round-up ready" broadleaf crops, as the key to their future. Many growers think the future is in minimum and no-till practices. Some predict that economic success lies in growing more crops for domestic consumption rather that for export, for example oil seed crops like canola.

In the end, farming is a business balancing the difference between costs (inputs, equipment, rent, interest payments, etc.) with sales. There is one key difference between farming and other businesses. The "family" in the family farm. "Some decisions have a personal basis, like soil conservation to leave a legacy for my son. The cost of chemical fallow (vs. extra tillage) is an additional $5 per-acre, but results in less erosion." "Farmers are not opposed to improved safety and environmental soundness. Sometimes they do and sometimes they do not affect costs. They will do their best and they want to pass on their land."

VI. Recommendations

The CPAI team and the EPA should make serious efforts to make their "presence in the field known". For example, although the CPAI "Listening Tour" to the area was a preliminary effort and farmers did not expect a great deal to come from it, the effort itself was appreciated. Considering the level of stress that the farmers in the CPAI area are going through, they are remarkably willing to discuss their individual situations. Care should be taken to point out that

outreach efforts and fact finding missions are just that, not preludes to additional regulations.

There is a general agreement within the community of the usefulness of the scientific method. However, there is a belief that requirements of replication are excessive and delay getting new crops and methods into the fields. This is one reason that the Wilke On-Farm demonstration (which is supported by the EPA) is popular among farmers. The emphasis is on getting promising new methods, rotations, and crops into the field in realistically sized plots. It can be argued that this approach is scientifically suspect without traditional levels of replication, especially in light of the recent higher than average precipitation levels, this approach is very well received by the farming community. Another concern regarding the use of science, is the feeling among farmers that the pesticide and fertilize application rate estimates used by the EPA in the decision-making process are unrealistic and are not representative of real-world usage. Scientific methodologies used by the EPA should be as transparent as possible.

The farmers have suspicions about the EPA's (and all regulatory agencies) tendency to set regulatory "moving targets", with shifting goals and personnel. This has led to some bitter feelings in the past. The farmers feel that they have "little voice" in the decision making processes that affects them. There is a fair amount of resentment in the farming community that EPA hearings are often simply "briefings" about decisions that have already been made. The EPA should actively cultivate the reality and the *perception* that community members are included in the decision making process all the way through. This is important to the communities' sense of fairness. This is also according to EPA, a cornerstone of the Community-Based Management strategy.

VII. Concluding Remarks

While this report is intended to be as representative as possible of the values, opinions and concerns of the dryland farmers in communities of the Columbia Plateau, it should be kept in mind by readers that it is based on the short-term fieldwork of one individual. Many other stakeholders were not included in this study. This is not because of the lack of their significance to the issues, but rather the lack of time available.

Certainly, foremost among this group are the women involved in family farming. While several farmers' wives sat in during portions of their husbands' interviews, there simply was not enough time available to interview them systematically. Although the farmers of the dryland region are predominantly male, women also have key roles in decision making on the family farm. Women are frequently the financial managers for the farms, and keep the books. They, along with other family members, make up the bulk of the labor force employed during crux periods, e.g. driving grain trucks during harvest. On smaller farms, their off-farm incomes are crucial. Other stakeholder groups deserving further attention include elected officials, commodities groups, landlords, laborers, small town retailers, educators, religious leaders, and others.

VIII. Glossary of Terms

Columbia Plateau Agricultural Initiative (CPAI): The Columbia Plateau Agricultural Initiative evolved from the EPA Region X emphasis on community-based management. This is an effort by the EPA to work directly with communities to identify and address environmental

issues in the context of community needs. The CPAI encompasses the five-county area of the Columbia Plateau in Eastern Washington State including Lincoln, Grant, Adams, Franklin, and Benton Counties.

Chemical fallow: The treatment of a field with herbicide—in place of, or in combination with tillage—in preparation of a field for a fallow period.

Dryland: Non-irrigated cropland, with wheat as the primary crop.

Fieldman: A chemical company field representative.

Inputs: The fertilizers and pesticides used in crop production.

Loess: A homogeneous, fine-grained sediment made up primarily of silt and clay, and deposited over a wide area (probably by wind) (Williamson et al.:1998).

No-till agriculture: Sometimes referred to as *direct seeding*, a system of conservation tillage with very little surface disturbance that leaves crop residues in place, reducing soil erosion. Narrow furrows are cut into which crop seeds are placed (Williamson et al.:1998).

Nonpoint source (pollution): A pollution source that cannot be defined as originating from discrete points such as pipe discharge (Williamson et al.:1998).

Organophosphates: A class of pesticides derived from phosphoric acid. They tend to have acute toxicity to vertebrates (Williamson et al.:1998).

PM-10: The 1990 Federal Clean Air Act made states responsible for monitoring and controlling the amount of small airborne particulates known as PM-10 (less than 10 microns). About one-seventh the diameter of a human hair, PM-10 particles are small enough to be taken into the body's respiratory system. PM-10 has been linked to a number of respiratory problems (WSU:1994a).

Recropping: Also known as *continuous cropping* and *annual cropping*. The planting and harvesting of crops on an every-year basis.

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