COMPETITIVE ANALYSIS OF WHITMAN COUNTY
AND
THE WHEAT FARMING CLUSTER

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EXECUTIVE SUMMARY

Whitman County, located in the corner of Southeastern Washington, has a long history of educational, agricultural and manufacturing excellence. It currently boasts one of the lowest unemployment rates in the State (Whitman, 2014). Contributing sectors to Whitman County growth include educational employment, related construction, manufacturing and agriculture production. The County faces challenges in continuing to encourage growth in manufacturing and maintaining the “family-farm” culture of collaboration that has led to farming excellence. Although Whitman County has traditionally been one of the most prolific producers of wheat in the entire United States, it is questionable whether wheat production—despite high proportions of exports—can be an economic driver for a region given wheat’s commodity-like properties. This report explores these challenges and makes recommendations to the Washington Grain Commission (WGC) as to how they can support Whitman County and the Whitman County Wheat cluster.

INTRODUCTION

The state of Washington has a reputation for producing and exporting high quality agriculture products internationally. In fact, 85-90% of Washington’s wheat production is exported, compared to 44% of the United States’ wheat production in 2013. The State of Washington is currently ranked the #4 state in total wheat production and #2 in average yield per acre\(^1\). Leading the way—Whitman County has consistently been ranked the number one wheat-producing county in the United States every year since 1978. Whitman County specializes in the production of soft white wheat, often used in pastries, pancakes, cakes, cereals and flatbreads. In 2013, soft white wheat accounted for 82 percent of total wheat production in Washington State.\(^2\) Whitman County’s proximity to Spokane, Washington and the large export share of wheat internationally has made

\(^2\) Ibid., 3.
Whitman County and the Wheat Farming Cluster natural choices for a study of competitiveness for
the Region and Clusters.

This report explores the general economic performance of Whitman County, the competitive
framework of the County based on the “Determinants of Competitiveness” which includes applying
the diamond theory (Porter, 2008), and provides recommendations that could enhance County
competitiveness.

Next, the report delves into the Wheat farming cluster by analyzing performance,
competitiveness and the value chain. Specific cluster recommendations are made to the Washington
Grain Commission (WGC), a self-governing agency of the State of Washington, whose mission is to
enhance the profitability of Washington wheat and barley growers by strengthening existing markets
and developing new markets; encouraging and supporting research to optimize grower, buyer and
end user benefits; and promoting and providing education.

WHITMAN COUNTY ANALYSIS

Whitman County was carved out of Stevens County in 1871 and covers 2,159.09 square
miles of land, ranking 10th in size among Washington State’s 39 counties. Whitman County was
named after Marcus Whitman, an early pioneering missionary in the western states. The county is
part of the Palouse region with wide and rolling landscapes. It borders seven Washington counties
and three Idaho counties, and is ranked 26th in population with a population density of 20.7 people
per square mile.

1. Overview of Whitman County Economic Performance

The county was originally home to Native Americans of the Nez Perce, Spokane and Coeur
d’Alene tribes. They sustained themselves on the variety of game and plant-life, including roots,
berries and nuts. The area acted as a major trade route, as it was long used by Native Americans on
their treks to the Great Plains to hunt buffalo. Although Lewis and Clark touched Whitman County
in 1805, early settlement did not take hold until 1859. Settlers were attracted to the Region’s ease of transportation in the form of trails and waterways (Snake River, Columbia River) and the fertile lands. The region began to boom with the introduction of railroad transportation.

1.1 History of Whitman County Economic Competitiveness

Given Whitman County’s abundant transportation options, it became a hub of activity for trading, military, railroad and agriculture activities as settlers began moving west across America. Agriculture was emphasized primarily because of the soil quality. The rolling hills of the Palouse, where Whitman County is based, were created by glacial activity during the ice ages. The hills are primarily composed of soil blown in from the West and South of the county. The soil is a very fertile loess—a combination of silt, clay and sand that is excellent for farming.

Glacial activity also contributed to the creation of the Snake River, a 1,078 mile long river that creates the southern border of the county. The Snake is the largest tributary of the Columbia River — which is the largest river that empties into the Pacific Ocean. The river system contributed to the development of transportation options that accelerated agricultural exports through Port cities in Washington and Oregon.

In a nod to agrarian roots, Washington State University (WSU) was established as Washington’s first land-grant college in 1890. WSU is by far the largest employer in Whitman County, constituting about 30% of overall employment.

Traditionally, employment in Whitman County tends to grow at a very slow and steady rate. Much of this trend is due to government employment’s dominant share of total employment. Interestingly, the relative size of government employment has shrunk as other industries have increased their total number of jobs. For the last 5 years, manufacturing employment has grown.

This trend towards greater diversification is a welcome change as continued budgetary constraints are expected to impact government employment over the next few years.  

1.2 Recent Economic Performance

Whitman County’s performance will be measured in terms of population growth, wages and income, and unemployment.

Whitman County’s estimated population in 2013 was 46,000. Population growth in Whitman County for the past twenty years has averaged 0.8 percent per year (Whitman, 2014). Population in the county is expected to continue growing for the next ten years at 0.7 percent a year. In comparison, Washington State’s annual population growth rate has equaled or eclipsed the U.S. annual growth rate of 1.01% since 1980. State population growth is expected to maintain above 1% in the coming years. Given that economists deem population growth under 1% annually as negative, it is a concern that Whitman County is not retaining its population.

The county annual average wage was $39,474 in 2012, which is well below the state’s average annual wage of $51,964 (Whitman, 2014). In 2012, Whitman County ranked 13th for average annual wages among 39 counties in the state. The Whitman County median hourly wage was $19.20 in 2011, which was below the state’s median hourly wage of $21.59. Over the period 2008 to 2012, 32.3 percent of Whitman County’s population was living below the poverty level. This is well above the 12.9 percent for the state and 14.3 percent for the nation. Although a higher

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5 Ibid.
poverty percentage could be attributed to the high proportion of college students that are working part-time, the numbers are alarming.

The civilian labor force for the first two quarters of 2013 averaged 21,960 in Whitman County, which was above the same period a year ago of 21,537. The number employed was also marginally up to 20,588 in the first half of 2013 compared to the first half of 2012 (20,135). Yearly averages in the labor force show stability in local employment, which is associated with the government economic base. The unemployment Rate in Whitman County was last reported at 4.90% in December of 2013, according to the United States Federal Reserve. The average annual unemployment rate is traditionally one of the lowest in the state with a ten year low in 2007 at 3.8 percent before it peaked in 2010 at 6.8 percent. The unemployment rate fluctuates throughout the year, reflecting seasonal changes in higher education employment.  

**1.3 Economic Composition**

Whitman County’s rich volcanic soil produces bumper crops of wheat, peas, lentils and barley. Also, the county centers on university towns – Moscow and Pullman – with youth-skewed demographics, high levels of education and cultural amenities generally found only in large urban areas. Increases in student enrollments mainly determine population and economic growth. The need for housing a burgeoning student population and construction and rehabilitation of college buildings drive Local construction.

The growth in manufacturing and stability of the governmental, financial and agricultural sectors helped the county economy remain relatively strong since the recession began in 2007. (See Exhibit 1).

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9 Ibid., 6.
Agriculture—Wheat, lentils, dry peas and barley are the mainstay of most communities in the county.

Agriculture was one of the two bright spots in the economy last year. Commodity prices were high, and yields were above average despite a late start to the growing season. Although prices are expected to be a little lower this year and costs are rising, this should be another profitable year for farmers if weather does not harm crops. A good year for farmers helps retailers, wholesalers and service providers. In the 1970s and 1980s, the Palouse was billed as the Pea and Lentil Capital of the World, producing more than 95 percent of the lentils grown in the U.S. and the vast majority of dry peas.

Government/Universities—Washington State University employs about 7,000 people, which is slightly less than one in three of the jobs in Whitman County. Although Washington State University has undergone severe cuts in state funding in the last four years, they managed to keep job losses down by increasing enrollments, raising tuition and gathering more research funding. The budget cuts may have finally come to an end. The supplemental budget passed by the Washington Legislature in 2012 was the first not to include cuts for higher education since 2007. Washington State saw its state appropriation reduced by 52 percent between 2007 and 2011.

Manufacturing—While the U.S. lost 4.7 million manufacturing jobs, or 29 percent, between 2001 and 2011, manufacturing employment more than doubled in the Whitman County area.
in the last decade from 1,138 in 2001 to 2,503 in 2011. Most of the growth came from Schweitzer Engineering Laboratories that now employs more than 1,800 people on its Pullman campus. Schweitzer Engineering, which makes products that minimize blackouts and electrical system damage, has rapidly expanded its markets and expects to continue to grow at a strong clip for years to come.

At the start of the year, Digilent, which designs and manufactures circuit boards for engineering students, announced it will expand into a 15,000-square-foot office in a building owned by the Port of Whitman to increase its shipping space. Digilent’s inexpensive boards allow students to configure circuits on programmable chips for calculators, video games and MP3 players or write programs that make microprocessor chips control similar devices. Digilent grew from 19 employees two years ago to more than 40 today. Over half work at its Pullman plant and headquarters while the rest work at engineering and sales offices in China and Romania. Its boards are manufactured in China. Digilent sells products at more than 1,000 universities in over 70 countries. It also sees hobbyists as a potential market.

Decagon Devices broke ground on a 27,000-square-foot addition last winter that will nearly double the size of its plant in the Pullman Industrial Park. The technology transfer company has steadily grown over the last six years from 55 employees to 100 today. The company develops and manufactures scientific instruments that measure water activity in food and moisture in soil. Demand has risen for its consumer-use food instruments as customers spend more time preparing their own meals instead of buying restaurant meals. In a sign of innovation, one of Decagon Devices’ products, a thermal and electrical conductivity probe, went to Mars to measure humidity and wind speed.

CONSTRUCTION- After peaking in 2007 at 1,870 jobs, construction has fallen continuously, dropping 31 percent, or 1,290, from 2007 to 2011. U.S. construction employment dropped 28 percent in the same period. Single-family home construction continues to be far below
prerecession levels, but commercial construction is fairly robust. Commercial construction in Whitman County could run 20 percent to 30 percent higher than in recent years. Washington State University began an $80 million update to Martin Stadium toward the end of 2011. Schweitzer Engineering Laboratories, which added a new building to its campus last year, is planning to build another facility there this year.

Cooperative Agricultural Producers, a farmer-owned cooperative on the Palouse, has plans to build a rail spur line and commercial grain operation on Washington Highway 271 between Rosalia and Oakesdale. In Pullman, the Hilltop Inn is planning a 54 room expansion, Hampton Inn is planning a 93 room hotel and the Holiday Inn Express is getting a $456,000 face-lift. The university’s record enrollment has prompted a spike in multifamily residential developments that may lead to a 420-unit increase in apartments in Pullman. First Wind broke ground on the Palouse’s largest construction project May 1. Fifty-eight wind turbines near Oakesdale in northern Whitman County, costing $210 million, will employ 150-200 workers this summer and eight once they begin operating in October.

SERVICE PROVIDING SECTORS—The vast majority of tourism is tied to events at the universities. Tight budgets at colleges across the nation resulted in less business travel and fewer academic meetings over the last few years. But there seems to be a slight increase recently in business and academic visitors. Given the high level of hotel construction this year, companies are expecting strong growth in the next few years.

Local governments lost 126 jobs between 2009 and 2011, falling 3.5 percent. About 70 of those job losses came from the Washington side. While other sectors were struggling, health care and social assistance grew 10.3 percent, adding 341 jobs between 2007 and 2011.
1.4 Key Economic Drivers

EXPORTS- Exports are an important economic driver which allows the region to receive funds inflows from abroad. As a result economic growth in the region is supported not only by these incoming funds, but by how these funds are recycled in the region. Although Whitman County export data is challenging to obtain, inferences can be drawn from looking at Washington State activity.

The most part of Washington’s agricultural production are exported to either overseas or to other states. Therefore, international trade represents an important economic driver for Washington growers and specifically to Whitman County as soon as wheat exports represent about 25% of all Washington exports overseas. (See Exhibit 2).

Exhibit 2:

<table>
<thead>
<tr>
<th>Country</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
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<td>$98.5</td>
<td>$115.8</td>
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<td>$12.9</td>
<td>$14.6</td>
<td>$18.3</td>
<td>$18.9</td>
</tr>
<tr>
<td>China</td>
<td>$12.1</td>
<td>$11.1</td>
<td>$11.8</td>
<td>$14.1</td>
<td>$13.5</td>
</tr>
<tr>
<td>EU-27</td>
<td>$10.1</td>
<td>$7.4</td>
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</tr>
<tr>
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<td>$5.3</td>
<td>$7.0</td>
<td>$6.0</td>
</tr>
</tbody>
</table>

China’s imports of U.S. agricultural commodities have increased by an average of 21.8 percent annually from 2008 through 2012.

INNOVATION- Whitman County is very fortunate when it comes to research and innovation because it is home to one of the top land-grant universities, Washington State University (WSU). On top of the benefits of being home to WSU, the county also enjoys the benefits of having a second land grant university, The University of Idaho (UI), just eight miles away in neighboring Latah County, Idaho. Although the universities are in different states, both schools along with the Whitman and Latah County Economic Development Councils’ have worked together to create The Palouse Knowledge Corridor (PKC). The PKC is a partnership between the universities, private sector, economic development agencies and government in an effort to increase economic opportunities for the Palouse as a whole. Although the research and innovation happening at the UI
is not happening directly in Whitman County, because of the PKC’s reach, Whitman County is benefiting from that work.

According to the PKC, WSU is a member of the elite group of Research Universities. With more than $213 million in research expenditures, plus $111 million in sponsored public service expenditures, WSU is among the top land-grant research universities in America. The PKC also states that the UI adds to the research and innovation happening in the Palouse area through research programs such as; Biomedical and molecular biology, Agricultural and natural resources, Plant, animal and fisheries, Environmental and ecological, Energy and water resources, Bioremediation and subsurface science, Nanotechnology and material sciences, and Educational program design and assessment.  

Patent generation and technology transfer companies are two examples of how Whitman County and Latah County have benefited from having two land grant universities within eight miles of each other. PKC emphasizes that the Corridor consistently generates more patents per 1000 people than the nation” (See Exhibit 3). In fact, Whitman County alone generated 287 utility patents from the year 2000-2011. 

Exhibit 3: Technology transfer companies are another example of how Whitman County has benefited from the research and innovation of the universities. Whitman County has seen a growth of technology transfer companies like engineering company Diligent Designs and the research based

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11 Ibid
manufacturing company Decagon Devices.

2. Determinants of Whitman County Competitiveness

2.1 Natural Endowments

Whitman County’s location within the state of Washington offers some obstacles to Whitman County’s overall competitiveness. Whitman County is located in the southeast part of Washington State which is fairly isolated in relation to any main metropolitan areas for the simplicity of conducting business. The uses of natural waterways are convenient as both the Columbia and Snake Rivers are easily accessible for transportation to the port cities on the West coast. Spokane, WA is the biggest metropolitan area in the region offering a solid and established infrastructure for helping aid in the competiveness of Whitman County.

Whitman County is covered with rich topsoil that is especially essential to the agriculture industry. Ancient glacial movement carved the landscape and deposited the rich soil that allows for the highly lucrative agriculture industry within Whitman County. Whitman County has an abundance of rolling hills that offer 10-15% more acreage per square mile that allows for naturally more farm land compared to flat acreage and aids in wheat farming by allowing the land to properly drain moisture. Partly as a result of the favorable natural factors, the county is currently nation’s leading producer of wheat with over 35 million bushels produced in 2012.

2.2 Macroeconomic Conditions

Whitman County has enjoyed a history of macroeconomic stability. Specific Macroeconomic policies and the social infrastructure and political institutions impacting Whitman County are explored in the following sections.

2.2.1 Macroeconomic Policies

Whitman County has a variety of factors that play into its overall success. Even though WSU is the largest employer, wheat plays a significant role in Whitman County, especially related to exports and ripple effect through the county.

MONETARY POLICY- Whitman County operates using the United States (U.S.) currency and is thus directly affected by interest rates and inflation. Interest rates within the U.S. are primarily based on policies and actions of the Federal Reserve. Interest rates have been stable and/or on the decline since the 2009 financial crisis. Lower interest rates allow for more borrowing and thus circulation of money within Whitman County (i.e. more farmers purchasing new equipment or land). Inflation has also been steady over the past decade, staying within the 2-4% range. The United States currency did depreciate a significant amount during 2009.\(^\text{14}\)

Whitman County is also affected to the currency fluctuations around the world in response to their large agricultural export industry. Asian markets are key to analyze as one of Whitman County’s biggest exports sector (wheat agriculture) is very dependent on Asian currencies to compete on a global scale.

FISCAL POLICY- Government taxation plays a key role into Whitman County. Washington State does not have a state income tax, but does operate under a sales tax (consumption) system. Whitman County residents and businesses operate under federal income tax levels ranging from 0-40% for personal income and up to 35% for businesses. Moreover, as the majority of the county wheat farms are family owned, the estate tax requires attention. The United States Estate Tax requires a filing if the assets left at the owner’s time of death account for more than $1.5 million.\(^\text{15}\)

Farm subsidies also directly affect Whitman County. The farming industry is heavily subsidized by the government, especially the wheat industry. From 1995-2010, Washington State received more than $4 billion in farm subsidies. The Whitman County wheat farmers alone received $337 million.16

2.2.2 Social Infrastructure and Political Institutions

Whitman County follows the U.S. in that its government is democratic in nature. It has elected officials at local, state and federal levels who help make, carry out and evaluate the law. The county as a whole tends to vote Republican as can be seen with their current U.S. Representative, Republican Cathy McMorris-Rodgers and in the results of the most recent U.S. presidential elections when 68% of the county voted for the Republican candidate Mitt Romney. Some of the stated Republican Party values include free market economies, limited government and promoting competition with healthcare and education.17

Whitman County’s social infrastructure is well suited to support its large university, bustling agricultural export industry and growing economy. Its basic social infrastructure includes healthcare facilities like clinics, assisted living facilities and two hospitals. The education system includes government funded K-12 education, access to a state funded community college and a four year university. Communication is made possible with up to date communication technology like high speed internet access, DSL, cable, satellite and wireless connectivity.

2.3 Microeconomic Conditions

2.3.1 State of Cluster Development

Whitman County enjoys a diversified cluster mix, ranging from government and education to manufacturing and agriculture. Some clusters have benefitted from this diversity, such as the

emergence of the agriculture and electronic measuring device manufacturing sectors related to the research and education occurring in close proximity to WSU. All major sectors are driven by innovation and technological advancement.

Cluster development in Whitman County has been enhanced by the collaboration between government and the private sector and by trusted, family-type relationships. The Southeast Washington Economic Development Association (SEWEDA) is organized to help coordinate the region’s efforts around developing prosperity, productivity, housing and infrastructure. They help encourage use of governmental business incentives. Incentives in the region include state tax deferrals, sales and use tax exemptions, rural area exemptions, High Technology Sales tax exemptions and High Technology Business and Occupation Tax credits.

The Whitman County agriculture producers operate from smaller, family farms. The producers typically sell products and gain information from local co-operatives (Co-ops). The Co-ops also link the producers to distribution channels such as river barges, rail transportation and trucking to get their product to overseas markets. The Co-ops also provide storage for farmers that want to maintain the commodities for future periods.

2.3.2 Sophistication of Company Operations

Whitman County has several "home grown" employers, such as WSU, Schweitzer, AVISTA, Chase Bank and others. Many of these companies have a long history in the market and are joined by a wide variety of businesses from banking to health care, and from printing to customer service centers.

In 2012, Schweitzer Engineering Laboratories, Inc. (SEL) was ranked #97 on the 15th annual “100 Best Companies to Work For” list, published by FORTUNE Magazine. Washington State has
the fourth highest number of companies on the list, following California, Texas, and New York. Most of Whitman county businesses are comprised of small and medium sized enterprises (SMEs) that create opportunity for competition and innovation.

2.3.3 Quality of the National Business Environment

The quality of the National Business environment is measured by reviewing four distinct areas for the region: Context for Firm Rivalry and Strategy, Factor Conditions, Demand Conditions and Related Sectors and Industries. The areas are summarized in Exhibit 4.

CONTEXT FOR FIRM RIVALRY AND STRATEGY - The various businesses in Whitman County operate under the regulations established by the U.S. Government. Competition within the area is constantly taking place. Agriculture producers may obtain direct governmental subsidies or be paid incentives for taking fields out of production. This impacts the producer’s decision-making process (i.e. to produce or take field out of production) and is governed by the prevailing micro and macro-economic environment. Manufacturing and agriculture sectors are taking advantage of research and development coming from local universities.

FACTOR CONDITIONS - Although Whitman County is considered rural, it does have a transportation infrastructure that supports its needs. The area has multiple airports of varying sizes to help with the transport of persons and goods. One drawback to the structure is that the major airport is 80 miles away and can be difficult to access during winter weather. Besides airports, Whitman has many highways that easily connect it to major metropolitan areas. State Highway 26 connects Whitman County to Interstate 90 and the Seattle Metro area to the west. State Highway 195 makes connections to destinations north and south, and State Highway 270 connects the major retail areas of Pullman and Moscow, Idaho. The railroad system has declined over time with several lines

Whitman Wheat Farming

being abandoned. Starting in 1994, however, the Washington Grain Train program was launched. It serves over 2500 members and farmers to transport grain from fields to market.  

Other infrastructure that aids in the economic success of Whitman County includes The Whitman Port, established in 1958 (State, 2014) The Whitman Port (Port) allows for manufacturers and other exporters to access river systems. With access to the river systems, exporters can easily and inexpensively get their product to export markets. Along with easy access to export markets, the Ports also offer other opportunities to Whitman County’s economy including developing land, consulting on projects and educating the populace as to the benefits of the Port’s work.

Of these focus areas, the Port’s development of industrial parks are beneficial to the expansion of the manufacturing industry in Whitman County. The Port has two industrial parks that house many manufacturing companies including transfer technology companies like Decagon Devices Inc. and Schweitzer Engineering Labs.

The Port also makes significant contributions to the area’s communication infrastructure, taking a lead in providing the internet connection to the region. The Port is involved in promoting and developing transportation infrastructure. One of the recent initiatives supported by the Port is Transportation Investment Generating Economic Recovery (TIGER). The project seeks $4.5 million in government help to repair bridges and construct new rail lines. It is estimated that the project will increase the number of rail cars transported from current 925 cars per year to 4400 for the first year with an amount increasing to 6700 cars by 2020.

Whitman County holds a highly educated population. According to the Census estimates, over the period 2008 to 2012 for Whitman County, 96.2 percent of individuals age 25 and older were high school graduates, which was much higher than that of Washington state (90 percent) and the

nation (85.4 percent). An estimated 48.8 percent of people in Whitman County 25 and older have attained a bachelor’s degree or higher. This figure compares favorably with the state (31.6 percent) and nation (28.2 percent) (State, 2014).

DEMAND CONDITIONS- Whitman County has many aspects that attract and offer economic advantages for organizations operating within the area. Whitman County has a leading research institution in WSU that supports a highly developed agriculture industry. The highly educated populace creates specific and often customized demand. Balancing that, however, is that a high percentage of residents are below the poverty level. That lack of income suppresses customized demand.

RELATED SECTORS AND INDUSTRIES- The interrelated industries of Whitman County are continuously increasing their sophistication and are mutually increasing the area’s attractiveness. The high importance of logistics, transportation, financial services and research-based institutions are critical to trade and commerce. The agriculture cluster (especially wheat production) is the leading export driver within the region. However, the supportive industries of WSU and various agriculture endeavors (machinery distributors and farmers co-op organizations) provide a working mix that helps to lead to the area’s economic success.

Exhibit 4: Quality of National (Region) Business Environment
3. **Recommendations for Whitman County Competitiveness**

To remain in a competitive position in an ever changing global market, Whitman County must diversify its industry and enhance its infrastructure.

The County is encouraged to leverage the work the PKC has done at the “knowledge” level and work to connect Pullman, WA and Moscow, ID at a more geographic level. Based on their populations under 50,000, Pullman and Moscow are individually considered micropolitan Statistical areas by the U.S. Census Bureau. To be considered a Metropolitan Statistical Area (MSA) and area must have at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties. Moscow and Pullman are just eight miles apart. If the two cities would encourage development toward each other, it is possible that in the future the two cities combined could be considered an MSA. If the area were defined as an MSA, it would qualify for more government money to improve infrastructure and possibly attract more big business.

With the new classification in hand, the county is encouraged to focus on specific infrastructure improvements that would make the region more accessible. Recommendations include commissioning a study to evaluate light rail transportation from Spokane to Pullman. A passenger line would make travel to the region more accessible and safe for students and parents, and would open the area for potential tourism. Another alternative is to consider widening the highway to four lanes throughout for enhanced speed and safety.

Finally, infrastructure improvements will encourage more manufacturers to consider Whitman County area for location of their businesses as they can receive and deliver product...

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components more readily, and it will have a correlating benefit to attracting and retaining talent in the region.

4. Whitman County Wheat Cluster Analysis

4.1 Cluster Context

The wheat industry involves the production of wheat grains and its processing into goods such as flour, bread, pasta, flatbreads and pastries. The wheat cluster includes wheat farms as well as upstream organizations such as fuel, seed, fertilizer and equipment suppliers and downstream organizations such as storage, transportation and milling firms.

Washington wheat farmers grow five classes of wheat: soft white, hard red winter, hard red spring, hard white and durum. Every class of wheat has different end-use characteristics. The protein content, bran coat color, milling and baking qualities all determine the most suitable end uses for each type of wheat.

The state’s wheat farms produce less than half the amount of grain that No. 1-ranked Kansas does, but they efficiently manage their fields to produce nearly twice as many bushels to the acre, and they do it on a fourth of the acreage. The average value per harvested acre of wheat in Washington for 2007/08 was $481 for winter wheat and $363 for spring wheat. In the rolling Palouse country of southeast Washington, Whitman County has consistently been the No. 1 wheat-producing county in the United States every year since 1978.

Today, the Northwest is the principal white wheat-producing area in the United States, and a major supplier for both national and international markets.

4.1.1 Brief History

The earliest settlers to Whitman County trace back to 1859 when military exploration of transportation routes began in earnest. The first settlements of note occurred in the summer of 1869 along one of the routes—the Union Flat creek. Many of the early settlers were stockmen who raised
cattle, sheep and hogs. Crops were introduced in 1870, and in 1876 the first shipment of Whitman County Wheat was shipped to Portland by steamer along the Snake River.

The Columbia and Palouse Railroad came into Whitman County in 1883, and on November 10, 1883, the first train arrived in Colfax. Additional rail lines were built in the mid-1880s through the county, making transportation easier. The first rudimentary telephone system arrived in Colfax in 1884. In that same year Charles Hopkins bought an old army telegraph line between Colfax and Almota and converted it into a long-distance telephone line -- it was a rarity to have long distance telephone service in the rural West in 1884.21

With the growth in population and with passage of time came technological change. In the nineteenth century, farm labor was done by hand and with horse-drawn plows and threshers (used to separate wheat from chaff). Steam-driven threshers appeared in the Palouse in the 1880s, but each machine required multiple horses and men to operate.

In 1893 the first mechanical device appeared in the county to cut, thresh, and sack grain in one operation. But such "combines" were expensive and it wasn't until the Idaho Harvester Company in Moscow began to manufacture a smaller machine that widespread combine harvesting became feasible. By 1930, 90 percent of Palouse wheat was harvested by combine.

Harvested wheat is taken by the farmer’s grain trucks to on-farm storage or nearby commercial grain elevators. After the wheat is sold, it is transferred by truck to regional rail- or barge-loading facilities. Over 60 percent of Washington’s wheat exports ultimately travel by barge from ports along the 400-mile Snake Columbia river system to Portland. About 36 percent of the wheat is eventually transported by rail to coastal grain terminals. From these seaport terminals, grain is loaded onto ocean freighters and exported to nations around the world.

4.1.2 Cluster Structure and Value Chain

The Whitman County Wheat cluster is composed of smaller, family farms who typically sell wheat through local co-operatives (Co-ops). Pacific Northwest Farmers Market (PNW) is the largest Co-op in the County, accounting for over 90% of the wheat production handling and distribution. The Co-ops also link the producers to distribution channels such as river barges, rail transportation and trucking to get their product to overseas markets. The Co-ops also provide storage for farmers that want to maintain the commodities for future periods.

These cooperatives played an influential role in cluster development spurring the development of private-public collaborations that created institutions that support the cluster such as the Washington Grain Commission (WGC) and its predecessors. Cooperatives were instrumental in helping the cluster lower labor intensity, increase quality and assist in marketing their products.

Distribution is a key element to the value chain. Whitman County wheat producers benefit from the abundance of transportation options due to its proximity to water and historical trade routes. Transportation of goods can be expensive, but multiple options increase competitiveness and reduce costs.

Finally, value is added to the wheat in the processing industry. Wheat is milled into grain for commercial or retail uses and eventually processed into finished goods like breads, pasta and ice cream. The most value-add is created in this step, and processors are typically close to where the finished product will be consumed due to perishability. The steps in the value-chain are depicted in Exhibit 5.
Exhibit 5: Whitman Wheat Value Chain

A cluster map details the upstream and downstream factors that impact the given industry. It includes related or inter-connected clusters that relate. Exhibit 6 is a cluster map for Whitman County Wheat.

Exhibit 6: Whitman Wheat Cluster Map
4.2 Performance of the Cluster

4.2.1 Export Analysis

Exhibit 7 below represents the exports of U.S. wheat in thousands of bushels. As exhibited in the graphs, the export market is comparatively volatile.

<table>
<thead>
<tr>
<th>Country</th>
<th>2010/11</th>
<th>2012/13</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philippines</td>
<td>841.6</td>
<td>807</td>
<td>-34.6</td>
</tr>
<tr>
<td>Japan</td>
<td>826.8</td>
<td>1047</td>
<td>220.2</td>
</tr>
<tr>
<td>South Korea</td>
<td>818.5</td>
<td>715</td>
<td>-103.5</td>
</tr>
<tr>
<td>Egypt</td>
<td>515.4</td>
<td>231</td>
<td>-284.4</td>
</tr>
<tr>
<td>Yemen</td>
<td>500.4</td>
<td>422</td>
<td>-78.4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>234.2</td>
<td>295</td>
<td>60.8</td>
</tr>
<tr>
<td>Thailand</td>
<td>147.4</td>
<td>163</td>
<td>15.6</td>
</tr>
<tr>
<td>Chile</td>
<td>124.3</td>
<td>189</td>
<td>64.7</td>
</tr>
<tr>
<td>Taiwan</td>
<td>108.4</td>
<td>129</td>
<td>20.6</td>
</tr>
<tr>
<td>Total</td>
<td>4117</td>
<td>3,998</td>
<td>-119</td>
</tr>
</tbody>
</table>


The reasons for volatility vary and represent a combination of international, political and country risks as well as the cultural specifics of importing countries. As Whitman County deals mainly with international markets for exports, it has to bear more risks connected with international trade. Other wheat producing states like Kansas don’t have to deal with international risks as they mainly operate within the domestic U.S. market. For example, the decrease of exports to South Korea is related to the fact that recently U.S. farmers were suspected of using Genetically Modified Organisms (GMO) for wheat production.

Korean consumers are extremely intolerant of the use of GMO’s and as a result, South Korea curtailed imports during its investigation. The decrease of exports to Egypt is connected to the unstable political and economic situation within the country. International risks and volatility of the market may be decreased by diversifying the trade markets both internationally and domestically. In such situations, of course, there is a risk of oversupply the local market. However localizing the sales is still one alternative which can be recommended to reduce the overall risk.
4.3 Determinants of Competitiveness

The wheat farming cluster has been successful due to many different factors. As stated earlier, the natural endowments that Whitman County possesses create a significant advantage for Whitman farmers versus other wheat producing areas around the world. Soil content, rolling hills, high wheat quality, natural climate, efficient transportation and the help of local research institutions are all inputs that further support the competitiveness of the wheat industry within Whitman County. Moreover, the demand for wheat is high especially in developing countries. The demand is getting more specific, or customized, as private buyers rather than governments become major purchasers and are demanding specific grain attributes. Soft white wheat that is specially produced in Whitman County is in specific demand in foreign countries for use in noodles and flatbreads.

The wheat industry is highly subsidized to help farmers within the industry. However, some farmers support these continued subsidies while others would like to see the money put elsewhere such as in crop insurance or research. The innovation of wheat farming stems largely from Whitman County. As Whitman County has the most hillside acreage farmed in the world, the technology was developed for the terrain. Although the leveling equipment for combines was not invented in Whitman County, the advancement and practical application of the technology was.

The wheat cluster does however face mounting obstacles. Wheat is a commodity and thus can experience unpredictable, large fluctuations in price, quality, and demand. The wheat cluster is even more dependent now on higher prices as most cost saving practices have been implemented. The profitability of U.S. wheat has declined relative to other crops, stemming in large part to foreign competition.22 Moreover, increased employment within the cluster is slow. Most wheat farms in

Whitman County are family owned. Family ownership plus the increased use of efficient machinery to harvest the wheat are continued indicators for low employment growth.

Lastly, wage rates are also a concern. Some wheat farmers are eligible for food stamps due to their income being below the poverty line. The Determinants of Competition are summarized in Exhibit 8 below.

**Exhibit 8: Whitman Wheat Cluster Determinants of Competition**

### Firm Rivalry and Strategy
- Innovation in technology-advancement of equipment leveling device to farm hillsides.
- The use of wheat farmer co-ops-come together to share benefit and losses.
- Heavily supported by Government subsidies-ensure wheat farmers are supported and taken care of but can reduce competition.

### Factor Conditions
- Generational farmers-Wheat farms have been around for hundreds of years (understand land).
- Research facilities-WSU and UI both have agriculture based research departments.
- Harvesting innovation-Equipment innovation (leveling technology).
- Natural Endowment-Soil, hillside, transportation infrastructure (water ways).
- Highly educated work force.

### Demand Conditions
- Worldwide demand-Staple in most all diets, should always have demand.
- High quality-certain geographic areas specially use soft white wheat for their products.
- Prices-Connected to corn prices.
- Quantity-over production result in global excess if all markets produce well.
- Buyers moving from governmental organizations to private--creating more specific demand.

### Related Sectors and Industries
- Co-op use-co-op protection (all share benefits/losses).
- Equipment facilities-sales/service/maintenance of expensive equipment close by.
- Fees collected by Grain Commission to represent producer interests.

#### 4.3.1 The Role of Regulation

Government regulation plays a key role in developing and sustaining the Whitman Wheat cluster. Wheat growers in Whitman County are regulated on many levels including at the local, state and federal level. Regulations for wheat growers deal mostly with the transport and safe consumption of their product. Examples of current regulations include ensuring that vessels used to transport bulk food are only used for this purpose and that the vessels are labeled as food vessels.
Other examples include proper labeling of food products for consumer protection. Consumers are
demanding to know where their food is derived from and how it might have been changed.

4.3.2 The Threat of Changing Regulation

Using Genetically Modified Organisms (GMO’s) in agriculture is an emerging issue in the
regulatory environment. GMO’s help growers increase production and decrease disease. A new
regulation being proposed would require Washington farmers to inform the end user about the use of
genetically modified food. According to the Washington Grain Commission Initiative-522 would
force Washington farmers and food companies to implement costly new labeling, packaging,
distribution and recordkeeping requirements that do not exist in any other state – whether or not they
grow or produce genetically engineered crops (GE) or food products. These and other regulations
are put in place to protect the end consumer but many times negatively affect Whitman County
wheat grower’s narrow profit margins.

5. Cluster Recommendations

In the short-term, given that Whitman wheat farmers are challenged to compete on cost, it is
in the industry’s interest to migrate away from commodity wheat production and focus on a
differentiated strategy that emphasizes the unique aspects of Whitman County wheat. The
Washington Grain Commission (WGC) has done a good job of marketing the quality of the wheat
(i.e. low moisture content and low dockage), but more can be done to uniquely position Whitman
County regional wheat as the brand of choice—similar to Kona Coffee or Cuban cigars. In the event
that the WGC deems this a regionally-narrow endeavor, it could explore the possibility of creating

(accessed March 2, 2014).
“appellations” for wheat production, similar to those utilized in the wine industry, that would have a broader state appeal, and give wheat production more cache.

For the long-term, the wheat cluster must focus on higher value-added products and employment, leveraging the existing high quality standards and processes in place in the region. Whitman County farmers have a strong advantage in production techniques and the key is monetizing the knowledge and research employed in the region. This can be done by harnessing the existing wheat production and research expertise developed in Whitman County and providing fee-based technical assistance to other countries or producers. This could include providing advice ranging from planting and tilling of fields, pest and weed control, maximizing production, fertilizer use, anticipating markets, and farm accounting techniques.

In order to increase the amount of farm consultant businesses and agricultural technology companies within Whitman County, it is suggested that WGC help create an agency that will cater to the needs of producer-entrepreneurs. The agency would provide both funding and education to those wanting to start their businesses at a very low cost. The education would be provided online and through a local agency to ensure that rural farmers have access.

WGC should also partner with Whitman County to create a Technology Transfer Incentive Program (TTIP) in partnership with Washington State University. TTIP will work with individuals who have developed technology at a higher education institution to commercialize their intellectual property or research and to create a plan to produce their product. The program will help with additional funding for individuals to manufacture their product in Whitman County.
References


