

An Economic History of Skagit County Agriculture”

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Abstract:

Skagit County agriculture has an intricate and successful history. The evolution of farm life has played a vital role in the Skagit resident from the Native peoples, to the first settlers, and today’s agricultural establishments. The geography and climate has endowed the upriver and delta regions of Skagit County with a unique history, placing them firmly in the upper echelon of agricultural producing counties in the Unites States. This paper will: a) identify several factors determining the productivity of Skagit agriculture, b) define their relationships to the Skagit County farmers’ decisions, and c) examine several trends in contemporary Skagit Agriculture. The resulting variables will be suitable for subsequent analysis of a variety of land use concerns facing the people of Skagit County.

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Table of Contents

Section 1 - Introduction

Section 2 – Skagit County

- a - The Geography
- b - The Climate
- c - The Skagit River
- d - Skagit County Soils

Section 3 – Skagit Agriculture

- a - The role of Skagit County in agriculture
- b - Summary of agricultural products in Skagit County
- c - Statistical Summaries

Section 4 – Factors in Skagit Agriculture

- 1) The agricultural landmass
- 2) Transportation
- 3) Markets and demand
- 4) Technical innovation
- 5) Policy innovations
- 6) Farm structure variables

Section 5 – The Timeline of Skagit County Agriculture

- Pre-history
- I) 1860-1920,
- II) 1920-1945,
- III) 1945-1965,
- IV) 1965-1984, and
- V) 1984-2007.

Section 6 – Conclusions

Section 7 - References

Section 1 – Introduction

The business of agriculture requires the synergy and coexistence of a myriad of sectors and decision makers. Individual industries such as farming, seed supply, equipment sales and maintenance, shipping, marketing, and resale each require an administration capable of determining the best expenditure of limited resources to meet their production needs. In doing so, each food production sector will provide the goods necessary to feed not only the local people, but the consumers of the world as well. The evolution of food production has resulted in vast specialization of labor and resource allocation to meet these global demands.

In North America, this has resulted in a spectrum of food producing capacities – some producing little food while others capitalize on their agricultural resources and emerge as food production powerhouses. Skagit County, Washington is an example of the latter. It has developed its physical, human, and natural resource capital in such a way that it meets the needs of its producers and contributes to the needs of the surrounding world. Since its separation from Whatcom County in 1883, the nature of Skagit County food production begins with the decision rule of the individual farmer and ends with the collective actions of the county’s producers. Along this path, the scarcity of resources becomes a central topic of discussion. In the context of Skagit County, the primary resource is the agricultural landmass supporting the food production ventures that sustain the local economy and the agricultural production needs of the global marketplace. The specific considerations, at the county level, have appeared in many forum. Consider the following reference:

“This study set out to determine the role of agriculture in the economy of Skagit County, and to view the agricultural sector in a perspective that will help shed light on the inter-relationships existing between producers, processors, related service industries, and state and local agencies... As a result future decisions and policies regarding crop production and marketing, land use, and environmental regulations can be made with greater insight. With this goal in mind the study examined the many yet inter-related agricultural activities in the county and makes recommendations that will assist not only those directly involved in agriculture, but the entire community as well.”ⁱ

This is an excerpt from the summary and conclusions of a 1972 report on agriculture and its role as an economic mainstay in Skagit County, Washington. Richard T. Daily and James C. Barron prepared this report at the request of the Washington State Department of Commerce and Economic Development. This appraisal of agriculture in Skagit County was part of a discussion that attempted to assess several possible land management alternatives. Four such land use patterns ranged between 1) agricultural intensification, 2) industrial expansion, 3) residential expansion, and 4) combinations of industrial and residential developments.ⁱⁱ This appraisal is as germane today as it was in 1970. The only difference is the increased expectations and pressures on agricultural operations and the world-class soils adjacent to the famed Skagit River. Certainly, the

same questions pertain today: What is the optimal arrangement between development and agriculture? How can we produce the foods necessary to feed the region (and beyond) while accommodating the steadfast growth of Skagit County residents? How can we optimize the agricultural processes, the technology, and the people who drive agricultural production in the Skagit today?

Agricultural life is defined by environmental and market factors that are varied and far reaching. The contemporary farmer has faced economic downturns and depressions, drought and flood alike, and erratic and constantly shifting markets. Ironically, the Skagit farmer faces the greatest challenge from an altogether human source distinct from global food consumption. In a 1995 interview for the Skagit Valley Herald, lifelong farmer Bob Hulbert noted, “This is the only rural area left in Western Washington. There’s no place left to go. Any further west and you get your feet wet.”ⁱⁱⁱ Another perspective offered by Oscar Loggarland, a retired dairy farmer near the confluence of the Old 99 Highway and its replacement, Interstate 90. “Its not just the homes or the hotels. It’s the other things people want to see, like wetlands and wildlife.” Loggarland continues: “They’re great... unless its farmlands or wetlands, dairy cows or eagles.” Like many other counties served by Interstate 5 the growth is palpable. The cities along the north-south corridor have experienced growth at a faster rate than towns elsewhere. The concern was simply stated by delta farmer Curtis Johnson. Regarding urban sprawl he posed, “Ask them about farming in Kent. If you went there today and looked around you’d never know that area used to be agricultural land, hay, crops, hops...”. Kirby Johnson, Curtis’s brother and fellow Skagit farmer noted that the agricultural ventures of the White and Green River areas eventually gave way to the sprawl that engulfed, what is now Kent, Auburn, and areas on to Tacoma. He asked, “What about Orting and the other farm communities left?” In the 1980-2000 timeframe Skagit County has witnessed a 61% population increase where most of these new residents are in the cities adjacent to the freeway, Mt. Vernon, Burlington, Sedro Woolley, and La Connor. Unfortunately for the county’s agricultural producers, these cities are also located on, and around, the counties’ upriver and delta farmlands.

Now, well into the 2000s, the development question has emerged again. The middle ground that must be realized is a strategy that balances the needs of development with the living, breathing nature of one of the most productive agricultural systems in the world. This is not an easy question to answer. We can see that the discussion has been detailed by decades of research and modeling. The key questions in the economic modeling of agriculture in Skagit County can not be answered by means of a critical mass; where there is a minimum acreage of land defining the lowest possible level of self supporting agriculture. Rather, the contemporary argument must incorporate the concepts of carrying capacities and variable fluctuations that can withstand challenges to the farmer and trends in the global marketplace alike.

Surprisingly, the producers themselves have clear ideas regarding the development encroaching on the Skagit farmlands. Contemporary interviews identify key concerns related both directly and indirectly to development, both in terms of pressures to sell agricultural lands off and to adapt to changes in agribusiness. It is the ability of the

Skagit farmer to guess what aspect of agriculture change and then adapt to the markets: modifying technology of milk processing, spending for new bagging and transportation of potatoes, adapting to changes in labor, and coping with prime real estate development. Perhaps an agricultural community unable to adapt as successfully as the Skagit farmers would indeed sell. Dairyman Loggarland notes, “It’s not very easy to go back to dairy production or crops after then condos are in.”

As with the 1972 report, this paper will attempt to present the factors facing Skagit County agriculture. These variables will have a direct impact on the decision of the individual farmer as well as the industry as a whole. Through defining these variables and their evolution we can address the existing relationships between producers, processors, related service industries, and state and local agencies. In doing so we can identify tools crucial to the agricultural landbase of Skagit County.

Section 2 – Skagit County

The Geography

According to the US Census of 2000, the population of Skagit County was 102,979. The total area is 1,920 square miles. Besides the mountains in the Cascade Range, Skagit County also contains Skagit Valley, the Skagit River, the islands of the delta formed by the forking of the Skagit River, the islands formed by the Swinomish Slough, and the Swinomish and Sauk Suiattle Indian Reservations.

Skagit County is located between Seattle and Vancouver, BC. It is geographically wide, measuring only 24 miles from its northern boundary with Whatcom County to its southern boundary with Snohomish County. Further, it is 95 miles wide; encompassed by the Cascade Range to the East and the Puget Sound to the West. Its adjacent counties to the east are Chelan and Okanogan, and Island and San Juan in the West.

It is well connected to neighboring Washington State communities via its north-south arterial, Interstate 5, and its east-west counterpart, State Route 20. The I-5 corridor serves the residents of Skagit County year round while HWY 20 is a seasonal mountain pass usually experiencing annual closures from November to April. The county seat, Mt Vernon, is among the cities directly linked with I-5 and State Route 20. Others include Sedro Woolley, Burlington, and Anacortes.

The Climate

The Skagit landscape has possesses many of the key characteristics common to successful food production, including suitable climate, abundant water and excellent soils. As is typical of the Pacific Northwest, significant rains and mild temperatures are evidenced by the lush growth of forest, pastures and agricultural crops. Skagit County exhibits characteristics of both the marine west climate in the western county and the alpine climate in the Cascade region of the east. The lower Skagit valley receives

approximately 230 growing days per year while the upper valley experiences only 200 frost free growing days annually.

Recently, Access Skagit County noted that “the average annual rainfall in the Anacortes area is 26 inches; in Mount Vernon 32.31 inches; and in Concrete 65 inches.”^{iv} These figures are similar to the commonplace practice of adding one inch of annual rainfall for each mile traveled east from Puget Sound. According to this method Anacortes averages 25 inches per year while Marblemount receives 95 inches per year. County averages range between 47.2 inches of rain (record high set in 1990) and 20.71 (record low set in 1987). Only 20% of the regions rainfall occurs in the summer months.

Regarding agriculture, the temperature swings lower in the winter and higher in the summer the further east the location. This means that the fluctuations are less severe in the westernmost part of the county (Anacortes, La Conner, Mt Vernon), and greater in the eastern part of the county (North Cascades National Park). This difference between delta farm operations and upriver operations has been cited as a key difference in the development of distinct delta and upriver crops. This was the answer offered by Oscar Loggarland when asked about the divergence in crop selections, specifically tree fruits and silage corn upriver and seed crops, vegetables, and potatoes in the delta. One study of berry growing operations^v, specifically the Sakuma Farm’s ‘Eliot’ organic blueberry production, cites the key conditions for optimal growing as: the climate west of the Cascade Mountains, having average temperature fluctuations of 22 degrees in the summer and 13 degrees in the winter. The further east we travel, the greater the chances of experiencing fluctuations outside of this range. Curtis Johnson made a similar note about the fragile nature of agriculture in general, noting that is region has even a slight advantage in climate over the Skagit then the crop is destined to leave. Mr. Johnson specifically noted the climate issue in the reduction of cabbage crops in Skagit County even though the cabbage seed continued to thrive.

The Skagit River

The course of the Skagit River begins in Manning Provincial Park, British Columbia in the Cascade Mountain range. It crosses the international boundary in eastern Whatcom County. The river runs west across the county to fork just past Mt Vernon. The south fork empties in Skagit Bay approximately 10 miles south of Mt Vernon. The north fork empties into Puget Sound approximately 10 miles north of Mt Vernon. This split results in Fir Island.^{vi} The river encompasses several tributaries and water systems including the Sumallo, Klesilkwa, Cascade, Sauk, and Baker rivers. It also contains the 24 mile long Ross Lake reservoir. The Skagit watershed, along with its tributaries, drains an area of 1.7 million acres. Thus making it the third largest waterway in the American west.^{vii}

The Skagit has been associated with massive logjams caused by the massive timber clogging the waterways. Settlers’ early forays into the mainland were made impossible by obstruction located near the current location of Mt Vernon. After years of timber salvage work, the logjam finally broke free leaving the Skagit navigable. Other recent logjams attributed to flooding have clogged the river near its mouth. They have

measured up to 730 meters, spanning the river from bank to bank.

The river system, including the dam free Sauk, is known for its quality of water which suits remarkable fish and wildlife populations. The Skagit provides habitat for all five native species of salmon and two species of trout; Chinook, Coho, Chum, Pink, Sockeye, Steelhead, and Cutthroat. Other notable wildlife relying on the Skagit includes Bald Eagles, Trumpeter Swans, and Snow Geese.^{viii}

The prime agricultural lands are located at the lower end of the Skagit river waterway where agricultural ventures are densely concentrated on the banks and alluvial fan of the Skagit. The resulting delta has deposited productive fertile soils at the westernmost portion of the county. This has resulted in two distinct agricultural features: the upriver farms and the delta farms.

Skagit County Soils

20,000 years ago Skagit County was covered by part of the Cordilleran Ice Sheet. As glaciers separated from the ice sheet and traveled toward the sea they carved massive valleys in the landscape. The Skagit River and its tributaries etched out courses through the valley to eventually empty into the ocean at various places over time, ranging from Padilla bay to its current mouth. As the river has evolved it has deposited fine soil sediments consisting of silt, clay, sand, and gravel.

According to the Washington State University agricultural statistics, geologically significant deposits of soils have collected in the flood plains and delta of the Skagit River. As a result most cropland and pastureland in the county are located in the floodplain delta area. There are five main types of soil in the floodplain delta area. Skagit soil, Sumas soil, and Field soil are on the delta, and Lorus and Pilchuck are along the river. These soils are productive in agriculture, especially the delta soils under dry land farming. Skagit delta soils are considered to be within the top 2% of agriculturally productive soils in the world.^{ix} This assertion is a considerable source of pride for the delta farmers. One account of delta soil quality is that a person can dig down several feet without finding a rock larger than a marble.^x Also notable is that the Skagit soils are topographically flat.^{xi}

The frequency of the Pacific Northwest rains does tend to make the Skagit soils acidic, however, requiring lime treatment prior to agricultural endeavors. Another consideration is the relatively frequent flooding associated with the Skagit River. A contemporary dike and levee water management system keeps salt water from the sea and freshwater from perennial flooding from inundating the delta soils. Occasional river flooding has contributed to the loss of some topsoils, while sea water incursions have resulted in salinization of topsoils.

Section 3 – Skagit Agriculture

From its earliest days, Skagit County has been a significant source of agricultural products. It had several well-established farm industries when it separated from

Whatcom County. Evidence of this early prosperity remains today. In this section we will discuss the role of Skagit County in agriculture, summarize its main products, and provide statistical summaries for Skagit agriculture.

A - The role of Skagit County in agriculture

Few agricultural communities survive west of the Cascades today. Many of the communities along the west coast of Washington State have witnessed development and urbanization. However Skagit County still possesses one of the largest and most diverse agricultural communities composed of 108,541 acres divided among 1,215 farms. According to Washington State University, Agriculture is the top industry in Skagit County:

“Agriculture is the No. 1 industry in Skagit County. Local farmers produce about \$261 million worth of crops, livestock, and dairy products on 93,000 acres of land. Over 90 different crops are grown in the County. Blueberries, raspberries, strawberries, tulips, daffodils, pickling cucumbers, specialty potatoes, Jonagold apples, green peas, and vegetable seed are some of the more important crops in this maritime valley. More tulip, iris, and daffodil bulbs are produced here than in any other county in the U.S. Ninety-five percent of the red potatoes grown in the state of Washington are from Skagit County.”^{xii}

Agriculture is currently the 5th highest employer in Skagit County industries. Agricultural production and services supply jobs to 3,300 people, or about 8% of the workforce (WESD 2002a). Further, total personal income in Skagit County was \$ 2.5 billion of which \$77.4 million was from direct production agriculture (BEA, 2002). Of Skagit County’s 2000 total output of \$6.7 billion, \$230 million was from the agricultural production industry (IMPLAN 2002).^{xiii}

According to the Skagit County Planning and Permit Center:

“Approximately 70 percent of this land is used for growing crops, another 29 percent is occupied in pasture and grazing land, and a small percentage (less than 1 percent) is occupied by orchards. Agricultural land-uses account for approximately 8 percent of all county land (Census 1997; WASS 2002a).”^{xiv}

The farmgate value of Skagit County agricultural goods was \$227 million in 2000. These goods can be broken into the three following categories: crops, dairy, and livestock and poultry. In 2000 crops were worth \$163 million, dairy worth 44 million, and livestock and poultry worth 20.4 million (SCCE 2002a).^{xv}

In addition to crops and animals, Skagit County agriculture also yields several key secondary benefits:

“In addition to food and fiber products, agriculture in this region provides habitat for thousands of swans, snow geese, and dabbling ducks.

serve the needs of this important industry. Each October nearly 6,000 people attend farm tours during the Festival of Family Farms to learn more about the bounty, beauty, and complexity of the valley's working landscape.”^{xvi}

agriculture
numerous agricultural suppliers, or

In addition to product sales, Skagit agriculture has also brought significant wages to the area:

“Skagit County agriculture employs over 3,300 workers annually. These are largely seasonal workers involved in direct agricultural production... In the western agricultural reporting area, Skagit and Whatcom Counties are the largest agricultural employers. For 2001, the major agricultural employers in the area were nurseries, raspberries, blueberries and bulbs, followed to a lesser degree by strawberries and miscellaneous vegetables (Wallace 2002).”^{xvii}

Another significant benefit is the support for producers and operators selling directly to the public. These may take the form of produce stands, restaurant or coffee shops specializing in local products, locally made jams or preserves, or flowers. Most notably, “Skagit’s famous tulip festival attracts about one million visitors each spring, generating \$65 million in annual tourism revenues.”^{xviii} This kind of agritourism provides meaningful interaction with the public and reaches consumers directly.

One final resource of agricultural lands is fiscal benefit with respect to development costs. A 1999 American Farmland Trust study indicated “that farm, forest and open land had a positive fiscal impact on Skagit County in 1997. Because of its modest requirement for services, open land created a surplus of revenue for the county. For every dollar of revenue they generated, farm, forest and open land only cost 51 cents. Residential development overall did not pay for itself, requiring \$1.25 in services for every dollar of revenue generated.”^{xix}

Skagit County’s long history of agriculture contributed by way of agricultural operations and products. It has also indirectly benefited Skagit residents through secondary industries and tourism.

B - Summary of contemporary agricultural products in Skagit County

Following is a description of products commonly referred to in the context of Skagit County agriculture. It includes crops, animals, plants, animal products, and other miscellaneous goods. The information is a summary of the agricultural products description from the USDA, WSU Skagit County Extension, and other sources.

General Crops – Green peas, dry peas, grains, oilseeds, dry beans, vegetables (including cauliflower, brocolli, and cucumbers), melons, potatoes, and sweet potatoes, and corn for silage. The Skagit processing industry revolves around peas. Recent lack of access to

pea processors has forced Skagit farmers to experiment with other crops. All cauliflower, broccoli, and most potatoes (reds, whites, yellows, purple, fingerlings, and chipping) are harvested for fresh market while the majority of cucumbers are grown for pickling. Skagit is ranked in the top 5 in the state counties for vegetables, potatoes, silage corn, and peas.

Seed crops – Cabbage, table beets, spinach seed, and other vegetables. Skagit County is a major producer of seed crops, necessitating 7 vegetable seed companies in the county. These companies supply seed to regional and global markets. Currently they supply approximately 1/3 of the cabbage seed to the world. One factor limiting the acreage of seed crops is crop isolation boundaries needed for the prevention cross-pollination.

Fruits –apples, blueberries, raspberries, strawberries, grapes, and tree nuts. The climate in western Washington allows for increased species of apples as compared to central Washington. Raspberries and blueberries are picked both by hand and machine and are used for fresh produce and processed for preserves, juices, and ingredients for other foods. Strawberries are picked by hand and used for similar markets as other local berries. The grapes in Skagit County are used primarily for wine production.

Flowers (including bulbs) - Nursery, greenhouse, floriculture, and sod. Approximately 1300 acres of Skagit agricultural lands are dedicated to tulips, daffodils, and iris grown for fresh flowers and bulbs. 75% of US production of tulips occurs in Skagit County, which also exports significant amounts of bulbs to the rest of the world. The bulb industry alone generates \$12 million in annual gross income. Skagit County is the currently ranked 1st in this category, and in the top 45 counties in the country.

Hays or grasses - Other crops and hay, forage-land used for all hay and haylage, grass silage, and greenchop. Pasture grass and hay have recently replaced some pea acreage, along with rye, barley, buckwheat, and grapes.

Animals – Cattle and calves, hogs and pigs, sheep, goats, horses, ponies, mules, burros, donkeys, and colonies of bees

Poultry – Chickens, layers, pullets for laying flock replacement, broilers and other meat-type chickens. Skagit County produces 10 million eggs per year and is home to the state's only chicken processor. Skagit county is currently the ranked the 6th largest producer of this category in Washington.

Animal products and dairy –milk and other dairy products from cows, sheep and goat products. Figures for dairy are noted in pounds of milk, the source of all creams, milkfats, and derivatives for other finished dairy products. In 2007 Skagit County produced more than 270 million pounds of milk. This placed Skagit 4th among state counties and 157th in the country.

Cut Christmas trees and short rotation woody crops – The climate and environment of Skagit County provides an ample harvest of native and imported trees and shrubs, including Christmas trees. Several Christmas tree growers are operating in Skagit County.

Aquaculture – fish, crustaceans, mollusks, and other marine produce. Here, aquaculture will be referred to as defined by the National Oceanic and Atmospheric Administration, “aquaculture is defined as the propagation (sic) and rearing of aquatic organisms in controlled or selected environments for any commercial, recreational, scientific, or public purpose.”^{xx} Skagit County's location places its residents in a location central to the northwest salmon harvest. Skagit aquaculture is ranked 6th in the state and 31st in the

country.

C – Statistical Summaries

Key statistical summaries from the 2007 Agricultural Census follow. Fields include general farm characteristics, the product item being discussed, the quantity of the product being produced by the agricultural industry in Skagit County, and the comparative ranking between Skagit and other state counties, and Skagit and other US counties.

Table 2: 2007 Census of Agriculture other county highlights for Skagit County.

Economic Characteristics	Quantity	Operator Characteristics	Quantity
Farms by value of sales		Principal operators by primary occupation:	
Less than \$1,000	418	Farming	479
\$1,000 to \$2,499	199	Other	736
\$2,500 to \$4,999	143		
\$5,000 to \$9,999	133	Principal operators by sex:	
\$10,000 to \$19,999	83	Male	940
\$20,000 to \$24,999	22	Female	275
\$25,000 to \$39,999	19		
\$40,000 to \$49,999	19	Average age of principal operator (years)	56.4
\$50,000 to \$99,999	48		
\$100,000 to \$249,999	33	All operators 2 by race:	
\$250,000 to \$499,999	27	American Indian or Alaska Native	20
\$500,000 or more	71	Asian	29
		Black or African American	(-)
Total farm production expenses (\$1,000)	215,218	Native Hawaiian or Other Pacific Islander	6
Average per farm (\$)	177,134	White	1,853
		More than one race	5
Net cash farm income of operation (\$1,000)	46,977	All operators of Spanish, Hispanic, or Latino Origin	35
Average per farm (\$)	38,664		

Table 1: 2007 Census of Agriculture ranked items among the 39 state counties and 3,079 US counties.

Item	Quantity	State Rank	US Rank
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD (\$1,000)			
Total value of agricultural products sold	256,248	8	210
Value of crops including nursery and greenhouse	174,169	11	110
Value of livestock, poultry, and their products	82,079	7	492
VALUE OF SALES BY COMMODITY GROUP (\$1,000)			
Grains, oilseeds, dry beans, and dry peas	4,204	15	1,547
Tobacco	(-)	(-)	(-)
Cotton and cottonseed	(-)	(-)	(-)
Vegetables, melons, potatoes, and sweet potatoes	75,494	5	34
Fruits, tree nuts, and berries	17,222	12	106
Nursery, greenhouse, floriculture, and sod	74,286	1	44
Cut Christmas trees and short rotation woody crops	199	13	240
Other crops and hay	2,763	14	618
Poultry and eggs	12,172	6	522
Cattle and calves	10,969	10	1,117
Milk and other dairy products from cows	47,173	4	157
Hogs and pigs	69	18	1,492
Sheep, goats, and their products	160	18	767
Horses, ponies, mules, burros, and donkeys	603	16	396
Aquaculture	10,522	6	31
Other animals and other animal products	410	12	436
TOP LIVESTOCK INVENTORY ITEMS (number)			
Layers	324,755	7	213
Pullets for laying flock replacement	45,836	6	341
Cattle and calves	36,544	10	867
Colonies of bees	5,079	4	138
Broilers and other meat-type chickens	2,300	8	753
TOP CROP ITEMS (acres)			
Vegetables harvested, all	19,456	6	49
Forage-land used for all hay and haylage, grass silage, and greenchop	18,594	14	1,109
Potatoes	10,353	5	27
Corn for silage	7,395	4	199
Peas, green (excluding southern)	5,203	2	7

According to the Skagit County Critical Areas Ordinance Programmatic Draft Environmental Impact Statement, Skagit County agriculture:

“affects other industries as well, through its spending for supplies, equipment, seeds, etc., and other buying and selling that is part of agriculture. The IMPLAN model captures the flow of economic goods and service among industries and assigns values to them. The sum of these effects in all industries is the secondary impact, i.e. the \$143 million in estimated secondary output attributable to land-based agriculture.”

The IMPLAN model is used for community impact analysis. It is input-output database and model used by 1,500 US communities allowing for inter-agency comparison of key analytical components, including agricultural statistics.^{xxi} The IMPLAN model of land-based agriculture in Skagit County summarized the following relationships between Skagit County agricultural and the surrounding industry sectors (in order of magnitude):

- 1 - Land-based agricultural industries (\$27 million);

- 2 - Agricultural, Forestry and Fishery Services (\$18 million);
- 3 - Real Estate (\$11 million);
- 4 - Petroleum Refining, Wholesale Trade (\$9 to 11 million each);
- 5 - Motor Freight Transport, and Warehousing (\$7 to \$9 million each);
- 6 - Owner-occupied dwellings, Maintenance and Repair (\$5 million min);
- 7 - Banking, Doctors and Dentists, Eating and Drinking (\$2 to \$5 million each);
- 8 - Other industries (less than \$2 million each).

The gains from food production – farm animals, dairy products, and seed crops – have provided vast opportunities for the residents and industries of Skagit County, and provided a means of sustenance for people far removed from the region.

Section 4 – Factors in Skagit Agriculture

The factors every agricultural producer has to weigh are varied and diverse. They define the basic equations underlying farming decisions: What can we produce? How much of that particular crop can we produce? How can we best use our inputs? Are there other farm plans we should adopt? Some of these variables affect the individual farmer in a positive way, such as innovation in seeding technology, while others increase costs of agricultural production. Specific examples of the latter include increases to an individual grower's fuel prices, scarcity in agricultural labor, and access to fertilizers or insecticides. Other variables define industry wide standards facing all agricultural producers. These include market prices, inflation, environmental impact considerations and other relatively recent policy developments. These variables can be responsible for shifts in either production technique or a redirection to a crop perceived as 'more profitable'. Further, interactions of these variables can entice new producers or force the experienced from established markets. As the Agriculture and Natural Resources Extension Educator for WSU has noted, these factors are the foundation for the yearly decision of whether or not to bet the farm.^{xxii} In this section we will be discussing these factors.

1. The Agricultural Landmass

The evolution of Skagit County agricultural landmass has benefited from several key variables: utilizing meadows historically suitable for downriver or coastal reaches, implementation of the water management system, and access to the arable lands yielded by the removal of area timber.

The process of managing lands in such a way that crop production was not only possible, but robust, began with the Native peoples and the earliest Skagit settlers. The first steps in procuring suitable lands begin with the cultivation of native plant species constituent to local sustenance. These meadows home to these upstarts were routinely subjected to fire ecology and crop management measures, including the importation of camas from the Columbia Basin.^{xxiii} It is no coincidence that the first non-Native producers ended up in these meadows first at March Point, then in the vicinity of the contemporary Sauk Suiattle Indian Reservation. These meadows would be the birthplace of western agriculture in the Skagit.

Another key development in the conglomeration of arable lands was the implementation of the dikes and levees. These early ventures were in the areas of present day La Conner. The first attempts to recover the potentially rich soils of the delta were implemented by Samuel Calhoun and Michael Sullivan. These men had witnessed the successes of similar diking practices in Pennsylvania. They were producing crops by 1870. According to Charles Easton (1976):

“Today dike work is mechanized; it is the responsibility of diking districts and the federal government, and no individual farmer has to worry about protecting his own land. In pioneer days, however, a farmer would stake out his marsh-land claim and proceed to erect a dike around it. This was done with shovel and wheelbarrow. Since work was possible only at low tide, the work schedule for months on end would be set by the tide table and not by the sun.”^{xxiv}

This massive task took decades to complete. Today, the entire Skagit River below Sedro Woolley is flanked by an intricate water management system. Most North American agricultural water management processes are designed to deliver water for irrigation, to recover and deliver reservoir waters for agricultural purposes, and regulate floodwaters. In contrast, the dyke and levy system in Skagit County is designed to deliver one additional benefit: the protection of prime delta soils from saltwater incursions from the Puget Sound waters.

The new management system coincided with the removal of the timber that hindered upriver settlement. This timber was both problematic for easy land travel routes and waterway navigation. The first timber recovery project aimed to remove the massive logjams on the river. The first attempt took 3 years. And by 1890, “logging operations had advanced far up the Skagit River, and, just as the supply of timber close to water began to run out, railroad logging was introduced.”^{xxv} The first permanent settlements beyond the mouth of the Skagit were now possible, along with the prime, flat soils underlying the new delta farmhouses.

Additional acquisition of Skagit County agricultural lands came from upriver developments, plots awarded by the Homestead Act, and Bureau of Indian Affairs leases with the Swinomish Tribe.

2. Transportation

Another key factor in the evolution of Skagit County agriculture evolved alongside the agricultural landmass. This is the incursion of increased travel to and from the Skagit landscape. Many would argue that this corresponding development is a crucial component of agricultural development because it provides increased access to agricultural markets, allowed for the arrival of new support industries, and brought new labor into the area. In fact the ability of a producer to get goods, and especially dairy products, to market is a requisite that contemporary consumers underestimates. Today, we see roadside fruit stands and farmer’s markets and the trucks and loading docks at the

local grocery stores. While we view these as commonplace, this system of providing fresh goods to consumers is the result of a more than a century of transportation.

This transportation began with the first sailing ships to visit the area. This was not an easy or cost effective manner of food transport. Waterway travel in the form of steamboats to the ports along contemporary Skagit County did provide a convenient means of timely transport of agricultural products. Significant road construction followed the 1883 separation of Skagit from Whatcom County. This led to an increase in roads, signs, and ferry service. Land travel between the Skagit area and the rest of the world began with access to Bellingham via the railroad, which stopped in Sedro Woolley. Other notable dates in Skagit County transpiration include the 1915 building of the federally maintained Pacific Highway. This connected the Skagit directly with Seattle, and to its well traveled international shipping hub. Travel between Mt Vernon and Seattle took several hours until the 1960's when Interstate 5 became the thoroughfare. This development, like all decreases in transport time, allowed Skagit producers to get products to market more efficiently. It also made it easier to travel to Skagit County for employment. This key development in the state infrastructure also enticed suppliers, processors, resellers, etc to the area. This aspect of transportation has been identified by contemporary producers as key in the ability to produce more.

Each major development of the travel history provided access to new buyers, regardless of consumers, processors, or resellers. As the scope of Skagit agriculture grew, some residents were specializing in services. Some of these would become processors, others pursuing trade in thee goods, or suppliers of the products needed to outfit the increasing needs of the Skagit farmer. It is unclear if the agricultural specialization evidenced today would have burgeoned without the increased ease of travel to and from the valley. The transportation developments resulted in established relationships beyond northwest Washington, growing from the local, to regional, national and eventually international markets.

3. Markets and Demand

Like any business, agriculture has to meet the demands of its customers. These customers grew from the farmer's own family to include local, regional, and eventually international consumers. This attention to customers can be seen from the earliest Skagit settlers growing and trading produce with each other to the USDA's analysis of the world agricultural commodity markets. As the nature of the Skagit's customers changed, so did their tastes and their willingness top pay for particular agricultural products. The result is a specialization in production of agricultural goods both suited for Skagit climate and soils and accommodating the demands of this new customer base.

Specific examples of these trends are the increase and decrease of apple production beginning in 1995 and ending in 1998. This was a direct result of price increases and decreases for apples. Additionally, specific species of apples have responded well to market demand. This has resulted in the recent shift to specialty apples. Another evidence of market accommodation is when one crop is more expensive – or less profitable – it has often been supplanted by other more profitable crops or internally

demanded resources in the interim. This was evidenced by the reallocation of pea acreage to artichokes, cherries, wine grapes, or pasture grasses or hay. One recent reaction to global markets is the decrease in acreage of strawberry fields due to foreign production. Additionally, some strawberry farmers are trying to shift species or production methods to stay competitive with market developments.^{xxvi} Another recent market development adopted successfully by Skagit growers is agritourism. This new market benefits Skagit agriculture in several ways. First, events like the Tulip Festival bring in upwards of \$65 million in income and hundreds of thousands of visitors. Agritourism also encourages interest in locally produced goods, organically or micro-farmed specialty goods, and educates the public about the agricultural industry in general.

Skagit County agriculture has historically been very affluent in adapting to shifts in market demands. Aiding in the navigation of markets and demands are processors, resellers, seed companies, and organizations like the Western Washington Agricultural Association. Identifying changing markets and shifts in the demand for local agricultural goods has propelled Skagit County to the top of the list of agricultural producers in the country. Certainly this phenomena was not isolated to agriculture. Similar accompaniments had transpired in the context of other natural resources, namely timber for Puget Sound development, labor for manufacturing and other sectors, and most recently the needs of mineral and petroleum refining.

4. Technological Innovation

To speak of technical innovation is to refer to a general discussion of technology and its evolution in specific contexts. Innovation can be a process of incremental improvements or completely new groundbreaking ideas. One classical definition of the concept of innovation was derived by Joseph Schumpeter^{xxvii}. This definition included 5 key considerations: a completely new good or higher quality of good, a new method of production, a new or evolving market, new inputs or intermediate goods leading to innovative goods, and a new industrial organization rendering goods in a new way. Each of these aspects of innovation can easily demonstrated in agricultural economics, especially in the context of Skagit County agriculture.

They are evidenced by a well-established literature on American agriculture in general. According to the Board on Agriculture and Natural Resources, there is an elaborate classification system of technological innovation in specific context of farm technology. When we discuss technological advancements, “We can distinguish among mechanical, biologic, chemical, and managerial innovations.”^{xxviii} These advancements can either reduce production costs by increasing the efficiency of either labor or capital, or increase the production yield. Yet other key technological advances also target demand. “With the rise in consumerism, the importance of product-based innovations has grown, and there is much effort to improve the quality of food products.”^{xxix} “A related category of innovation is improved postharvest performance of agricultural systems, for example, that extend the shelf life of fruits and vegetables or that streamline shipping and handling.”^{xxx} Some innovation has been the result of the environmental movement, where increased value of protecting environmental quality is accomplished by reducing

the damage caused by agricultural activities.

Again, each of these aspects of innovation can be exemplified in agricultural economics – especially in the context of Skagit County agriculture. Some of the particular factors cited by agricultural workers and county extension researchers include: the strength of average tractor or truck in horsepower, the diversification of mechanized equipment, the changes in the numbers of farm equipment per agricultural grower, strength of pesticides or fertilizers, and the development of distribution systems to emerging marketplaces.

5. Policy Implications

When considering legal mandates that affect the agricultural producer it is a common misconception to think only of agricultural measures like Agricultural Act of 1933. Indeed, policy factors facing the American farmer extend beyond the farm scope. Consideration must be given to subsidy measures, trade and tariff considerations, pesticide regulations, agricultural fuel policies, tax codes, etc.

Some of these past legislative considerations can be viewed in terms of their positive impacts. Certainly, agriculturalists would not argue about the merits of the Homestead Act and its role in awarding producers with vast tracts of land. Like wise, subsidy measures enacted as part of wartime planning have boosted the production of specialty and staple crops alike. From the New Deal and the 1933 Agricultural Adjustment Act to the 2002 Farm Bill evidence of farm support is clear. However we can also see a dichotomy in farm policy: in failures to collapse postwar farm prices, in the 1985 Food Safety Act's pressures designed to keep crops out of sensitive areas, and recent failures aimed at price supports. This dichotomy is summarized by Daniel A. Sumner:

“There is general acceptance that there are some broad public goods and industry collective goods in agriculture that will not be supplied appropriately without some government involvement and perhaps funding. Examples include agricultural research, information services, and control of harmful invasive species... There is also widespread support for using public policy to respond to rural environmental externalities. The argument is that a substantial reallocation of funds is necessary to achieve a whole host of environmental objectives through incentives and compensation rather than mandatory regulation... The 2007 Farm Bill is being developed during a period of particular attention to the problems of the current programs and unmet goals that could be addressed by alternatives. Whether these alternatives replace or significantly alter the historic commodity support programs is the primary issue before Congress and the public.”^{xxx1}

Certainly it is appropriate to point out acts that had major impacts of the farmer's ability to plan, raise, harvest, and sell agricultural products. It is also crucial, especially over the last 20 years, to include discussions over environmental and endangered species protection measures. Even policies aimed at planning and implementations of development have far reaching effects. Legal fees, consultant wages, and the expense of lobbying can add to the legal framework of agriculture.

6. Farm Structure Variables

Finally, the set of variables that face every farmer on the micro level are our structure variables. These are the individual economic means of determining whether or not to produce. They can be considered the variables precipitating the farmer's decision problem. These include the traditional variables we think of when we view the individual producer. Some of these variables are listed here:

Variables of interest identified by interviews with Skagit County agricultural resource persons:

- 1) Farm income or profitability for current product categories (crop, animal or animal products, dairy, etc);
- 2) Access to or distance to processors/market places/customers;
- 3) Transportation or fuel costs of farmer to get to processors/market places/customers;
- 4) Costs of farm inputs such as fuel, fertilizers, insecticides, pesticides, equipment, etc;
- 5) Costs of technological innovation like new purchase price of new equipment, investment in new technologies for management, or opportunity cost crops due to experimentation of new rotation or planning techniques;
- 6) Employment and unemployment rates, for agriculture and agglomerated 'all-other' categories;
- 7) Labor costs for farm family members, seasonal employees, migrant workers, organic produce or specialty employees, agritourism employees, etc;
- 8) Agricultural price indices for disaggregated sectors/crops;
- 9) Other

Other variables that may provide probative value for regression analysis include:

- 10) Farm size, farm class, farmgate value;
- 11) Farmgate value total farms, or of specific crops/sectors
- 12) Horsepower of tractor or trucks used in agricultural production;
- 13) Percentages of total production of individual crops (corn as % of total, etc.)
- 14) Population of Skagit County, Washington State, US, etc
- 15) Other

While each variable described above has various specific interactions with the decision process of agricultural producers – both small scale and big business ventures alike - they each have far reaching implications. They truly define the probabilities and expectations of 'betting the farm'. These variables have evolved alongside the farmer, often providing a metric of agricultural life. Indeed many of the most basic decisions of the agricultural producer depend on some combination of decisions of these variables weighted against the uncertainty of weather, environment, and market. In the face of changing American agriculture the Skagit producer, like farmers around the world, are faced with the challenge of staying competitive. This involves the optimization of the factors described above, the inclusion of the processes of coordination and cooperation in crop management, and negotiation of the unknowns beyond their control: favorable weather, inundation by either seawaters or river runoff, or late or frequent frosts. Among the

variables usually associated with farming ventures around the world, Skagit agriculture is an amalgam of nearly all. Further, there are several single variables and combinations of variables distinct to Skagit agriculture.

Section 5 – The Timeline of Skagit County Agriculture

The purpose of this report is to provide a historical sketch of agriculture in Skagit County, Washington. In doing so I will present a historical overview of the county from its prehistory until its most recent industrial trends. The following periods have naturally emerged as discernable eras by the availability of written text, census data, significant world events, and other historic measures. I) 1860-1920, II) 1920-1945, III) 1945-1965, IV) 1965-1984, and V) 1984-2007. A brief look at pre-historical times precedes the historical overview.

Pre-History

The area ultimately defined as Skagit County was home to Native peoples for millennia. These tribal groups were largely extended families living in villages in cedar plank houses. They had active, viable communities that socialized and traded far beyond their villages and region. They fished for salmon, collected clams and mussels, and used fire to encourage bracken fern and camas to grow on natural prairies.^{xxxii} In 1850 there were 11 different tribal groups in Skagit County.

many of these tribal groups moved to a reservation on the southeastern end of Fidalgo Island.^{xxxiii}

After signing the P

Prior to the 1846 treaty with England no significant incursion into the Skagit had taken place. Early explorers of the Puget Sound sailed through the Islands, but there is no record that any explorers made contact in Skagit County.^{xxxiv} This absence persisted, even in the occurrence of the burgeoning worldwide beaver pelt trade. Settlement in the Puget Sound area did begin shortly after the 1846 Treaty. Immigration into the area followed one of 4 main travel routes: 1) overland by covered wagon to the Columbia River, 2) by sea around the Cape Horn, 3) by sea to eastern Panama and then from Sea from western Panama, 4) or from California (which was not easily available via the completed Union Pacific and Central Pacific Railroad until 1867).^{xxxv}

The dense nature of forests in the Pacific Northwest was exemplified in the Skagit. The massive canopy and the course, choking underbrush provided significant difficulties to easily traveled routes for prospective homebuilders.^{xxxvi} Typically, settlers established footholds in amenable prairies or meadows such as March point, Guemes Island, and Samish Island. These pioneers were attracted to the prairies where the Native people cultivated camas and bracken fern. It was on these well-used lands that settlers first planted potatoes in 1853. Upriver establishments did not emerge until the 1860s. Until this time, mainland homesteads were confined to waterways and the logjams associated with the wandering river's driftwood.

The practice of Skagit farming changed dramatically from its onset in the 1850s until the most recent US Census of the Agriculture in 2007. The timeline has witnessed changes in key characteristics ranging from the size and scope of the farm, the tenure and propensities of the farmer, and the nature of the markets and international forces agricultural businesses must react to. For instance, US Census information tells us that in the 100 years between the 1900 and 2000 undertakings the population in farming dropped from 38% to less than 5%, or around 3,115,172 farmers^{xxxvii}. At the same time, the population of the United States steadily increased. The result was an increasing demand for agricultural goods. At the same time, the prices agricultural producers receive for their products have not kept up with their increasing production costs.^{xxxviii} According to the USDA Cooperative State Research, Education, and Extension Services, “narrow profit margins have driven smaller producers out of agriculture and forced larger producers to become more efficient in their operations—minimizing expenses while maximizing production.”^{xxxix} Skagit agriculture, like American agriculture in general, was based on maximizing production. A diverse production environment was needed to sustain the industry. American agriculture fed its population (and populations around the world) by generating large surpluses from fewer and fewer resources. The production of agricultural crop or livestock commodities must entertain basic economic concepts such as supply and demand, biological and genetic considerations for animal stocks, political and legal issues affecting agriculture, and technical planning and maintenance of recent advances to capitalize on today’s harvest. Further, these factors must be managed in such a manner that investing a farm’s resources today will finance future generations of producers. While each of these aspects of agricultural management is crucial, they must be orchestrated such that the interactions form a system capable of adapting to the dynamic, often volatile, nature of farm structure equation. This section will address the major shifts in the variables that define the farm structure in Skagit County.

1860-1920

1) 1860-1920

In North American agriculture most water management systems are designed to deliver water for irrigation, to recover and deliver reservoir waters for agricultural purposes, and regulate floodwaters. In contrast, the dike and levy system in Skagit County is designed to protect delta soils from saltwater incursions. Serious attention turned to precluding the deposits of salts in the soil in 1863. The inaugural dikes to impede the seawaters were constructed in the marshy flats near present day La Connor^{xi} by Michael Sullivan and Samuel Calhoun. This rudimentary system was constructed by hand shovel and wheel barrow and “It, needed to extend all along the salt water side of the claim and far enough up the major sloughs witch edged it to be beyond the reach of the tides.”^{xli}

With these early water management systems came with the first signs of agriculture in what was previously considered “useless wetlands”.^{xlii} In addition to the potato pastures that flourished in meadows previously tempered by Indians farmers began to cultivate crops that did well in the salty soils. Oats were one particularly hardy crop in these conditions. The allocation of croplands to oats was initially very high while the salts

were leached out of the soils.^{xliii} Meanwhile, the sites of trading posts grew into small towns, namely La Conner (which enjoyed a shortlived tenure as county seat), Guemes and Samish Islands, and Anacortes. These early cities enjoyed water travel access, stores and posts for Indian trade, and post offices. Shortly after, these cities would be home to greater industry.

Alongside the upstart agricultural ventures logging camps abounded. Beginning with the dismantling of the massive logjam adjacent to Mt Vernon, the timber industry brought steady employment to the area's saw mills, as well as new open areas suitable for agricultural expansion. Crop and pastureland flourished as the massive cedar trees fell. Mining camps also arrived on the Skagit River and Ruby Creek in 1879. While these camps found little viable success in precious metals they did spur interesting the deposits of limestone, coal, iron, and talc. These resulted in settlements such as Hamilton, Birdsview, Concrete, and Marblemount. Another industry enjoying the amenities of the Pacific Northwest was fish canning. The canneries that started in Anacortes in the 1890's remained viable well into the 20th century.

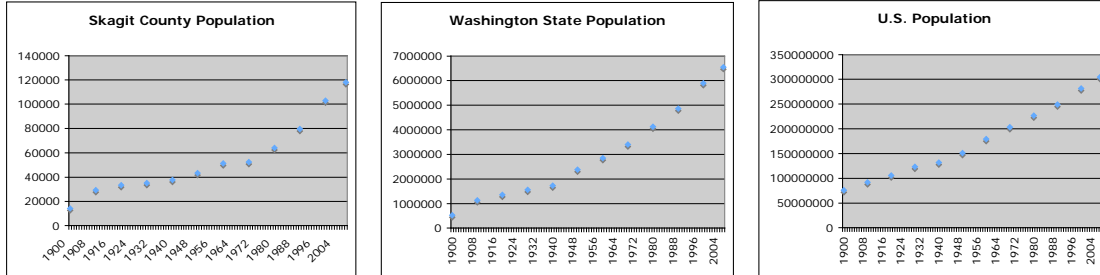
With the new communities accompanying new industries came a desire for connectivity to the outside world. Key developments in the last decades of the 19th century were in roadway construction, railroad survey and building, and telegraph lines. Once the waterways became more reliable for travel the mail inland mail service also developed. The railway brought reliable communication with Bellingham, regular mail delivery with Everett and Seattle, and local and long distance acquaintances via the first telephone system in 1894.^{xliv}

In spite of all the development, agriculture persisted as the economic mainstay of Skagit County. The massive increase in population spawned by the simultaneous mining, timber, construction, and agricultural industries demanded more food. Oats and Peas were dominant early crops. The 1880's witnessed the development of a seed crop industry. This began with A. G. Tillinghast in the La Conner area. Seed crop cultivation and harvesting grew to include beets, cabbage, flax, spinach, and mustard. Tulip bulbs were a non-food crop that found success as well. During the early 1900's another significant crop was developing; tulip bulbs. This horticultural specialty grew to considerable proportions by the midpoint of the 20th century.

The early structure of Skagit farms and farm households, as well as the rural communities that they form, is significantly different from community that survives today. In the mid-Nineteenth Century most of Skagit County lands were marshy wetland or old growth timber. Neither of these was a great fit for crop cultivation or animal herding. Therefore, the most influential factor in the early growth of Skagit agriculture was the availability of arable lands. The key factors during this time period were occurrences that increased access to suitable farmland. These included the formation of dikes and levees to control the amount of salt that was deposited in the areas soils, the removal of the large timber stocks (both on land and in the river's massive log jams), and an infrastructure suitable for transportation of and communication between the burgeoning population. Population is helpful in determining the number of persons in a geographic location. Reductions in

population denote a decreasing concentration of individuals per location. Conversely, increases in population denote a concentration of persons in a geographic location. The following charts show the long term increases in County, State and National population during the Twentieth Century:

Charts 5.1-5.3



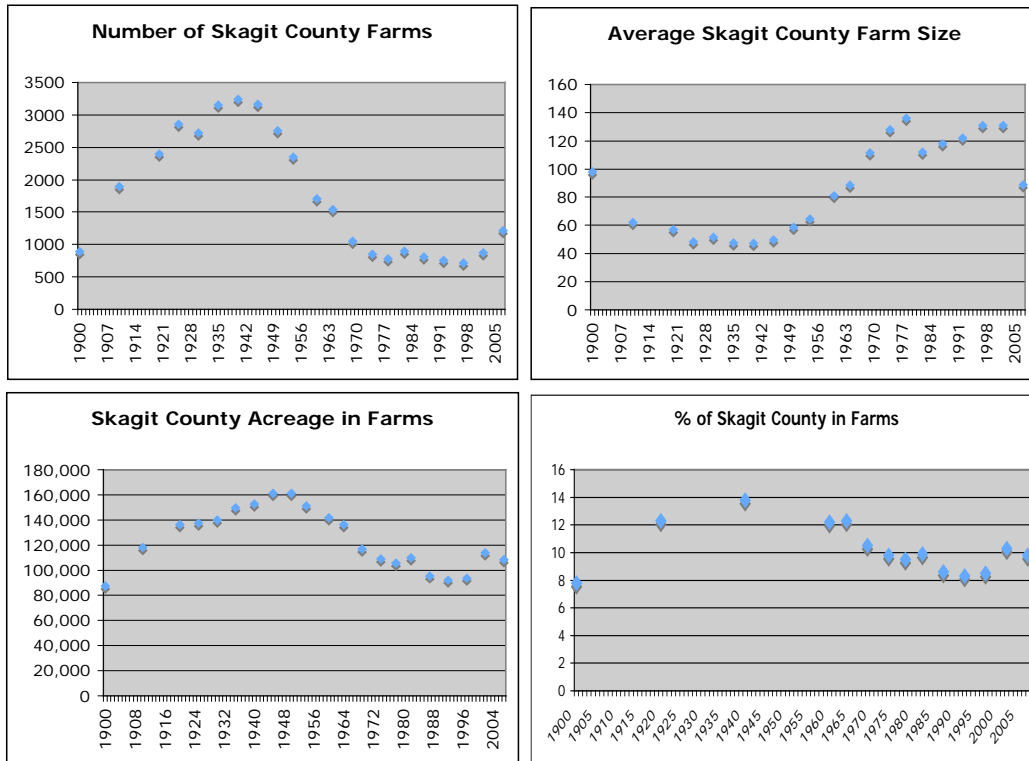
One important observation for the time period from 1900-1920 is that the slope of the population line indicates a rapid growth for Skagit County. Washington State is also steeper than the U.S. National population growth. This can be interpreted as an expansion of Skagit County that is outpacing the western expansion exemplified by the State of Washington. One reason for this accelerated growth is the migration of labor resources. At the turn of the century workers found themselves in a labor free to move between sectors. Not only was the worker able to change between agricultural (rural) and non-agricultural (urban) sectors, they were also able to change between regions of the country. Consider, “in 1910 farm wage rates in the Pacific Coast states were almost 3 times the level of farm wages in the South.”^{xliv} This happening at the same time as the newly opened railways and shipping routes to the Pacific Northwest added to the growing Skagit County population. And as the local population increased, so did its demand for food stocks to feed itself. Additionally, as travel to and from the region increased, specialization allowed Skagit County to feed other regions as well. New customers equated to new markets, and eventually new competition.

This era witnessed the application of the steam and gasoline engines to processes of threshing, plowing, planting, raking, harvesting, and milking. The inventions of the likes of Cyrus McCormick, Patrick Bell, George Brown, and the innovations of Henry Ford quickly spread to the Northwest.^{xlvi} These developments reduced the farmer’s reliance on simple manual labor per acre by increasing the ability of a laborer to plant more, to fertilize more, to harvest more, etc. By the time the Ford Motor Company had made the Fordson tractor available, many farmers were able to invest the \$397 to increase their daily routines.^{xlvii} By the end of the era, other tractors and the attachments for performing cultivating, weeding, chopping, and spraying duties, further changing the relationship between farm and labor. Another important technical innovation during this time period was the invention of artificially made nitrogen fertilizers. In 1908 chemist Fritz Haber fixed nitrogen to hydrogen under high pressure in a laboratory setting. This development had a worldwide impact on agriculture boosting the productivity of a piece of land by preventing key nutrients from leeching out of the topsoil.^{xlviii}

The factors dictating the increase in Skagit farmlands can be illustrated in the following

charts describing farm numbers, size, and acreage in Skagit County. These diagnostic indicators denote the total number of county farms, the average size of farms in acres, the amount of Skagit county in farmlands, and the total percentage of county in farmland. Here, we can see steady and significant increases in the number of Skagit County farms, county acreage in farms, and percent of county lands in farms:

Charts 5.4-5.7



In the time period from 1900-1920 we can see specific trends in the statistics of these key descriptive farm variables. First, we can see a steep increase in the number of agricultural establishments in Skagit County. Visually, this is represented by sustained positive slope indicating an increase of approximately 1500 farms. The first two decades also exhibit a decrease in average farm size of 50 acres. Finally, we can see that the amount of Skagit land in farms increases both in total acreage and percentage. Through the end of this era, wartime production was high as American farmers tried to meet the demands of the national and international markets, and meet the needs of a world at war. American troops overseas as well as displaced refugees and allied personnel added to the numbers that Skagit agriculture had to meet. Particularly strong wartime activity can be viewed in the positive slopes of the farm number/acreage indicators from 1915 to 1920. The outlier is the average size of farms, however note that although there is a negative slope in this period – the shape of the function indicates a slowing of reduction of wartime farm size.

Agriculture, at the onset of this time period, was labor-intensive requiring hand shovels

and animal driven machinery. More than half of the American population lived in rural communities; many on small, diversified farms. These farms employed close to half of the U.S. workforce, along with 22 million work animals, and produced an average of five different commodities.^{xlix} Skagit agriculture enjoyed significant technical labor saving and population changes that precipitated both an increase in the number of farms, and in the total land allocated to agricultural production. As a result of Skagit agriculture's transformation, the Skagit producer would begin to specialize in particular crops and animal products it was suited for. By drawing from the fledgling technical advances and a growing population of consumers, Skagit agriculture would vastly increase its output in the next era. These factors would be two of the primary long run keys to the continued success of Skagit County agriculture. Technologies from around the world, people immigrating from and trading with the rest of the world, and communications with markets outside the Skagit area helped to fuel rising agricultural commodity prices that helped to make 1910-14 the "golden age" of American agriculture¹.

1920-1945

II) 1920-1945

From the 1920s on, farmers began growing vegetables commercially for packing and processors. The primary crop was peas. Other crops included green beans, spinach, and fruits. The crops were harvested and sold to large packing outfits including the Bozeman Canning Company, San Juan Island Company, the Skagit Valley Packing Corporation, the MacMillan Canning Company, and S.A. Moffet. Additionally, hay was grown for fodder the increasing dairy industry.

Another area that experienced an increase in production was the seed crop industry. This grew in both in terms of the numbers of seed varieties and the number of operators growing seed crops. Many of the seed growers utilized new innovations to replace harvesting by hand. New players in the seed crop market such as Charles H. Lily implemented other significant innovations.

This period also experienced an increase in the bulb production industry. In 1926 Sam Stewart joined his mother in the bulb industry and started the Tulip Grange Bulb Farm near La Conner. Another major operation relocated from adjacent Whatcom County. These farms were the foundation for a thriving industry that is today the basis for the Annual Skagit Valley Tulip Festival.

In addition to vegetable and seed crops, there was an increase in dairy production. Since the turn of the century over 900 dairy farms were operating. According to Oscar Loggarland, most of these operations were smaller in herd size often had other agricultural interests besides dairy. Hundreds of these farms produced milk for a variety of uses beyond home consumption. Developments in pasteurization (or ultra-pasteurization) and packing helped the industry to thrive because fresh milk could be delivered to customers further away. Several cattle management programs also helped

the quality of the herd such as breeding programs, tuberculosis inoculation programs, and local farm agent cattle demonstrations.

Many of the smaller dairy outfits had made their own cream or butter, but with the advent of better transportation they were able to sell directly to specialty processors for dairy products, particularly cream and butter. One such processor was the Mt Vernon Creamer. Also in operation since 1907 was the Carnation condensory plant. To offset the costs of breeding programs and new shipping techniques cooperatives were created. These organizations, such as Darigold, would charge a fee for \$10.00 per cow for a membership. Their cow would then be able to access programs that would in turn make the dairymen's herd more productive.

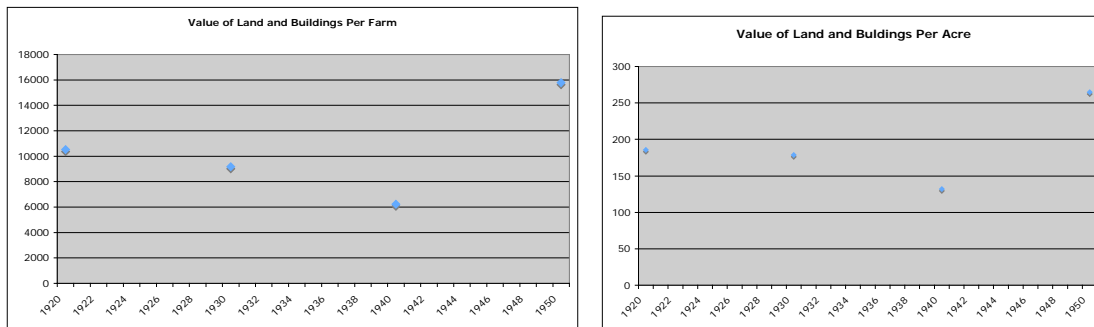
This time period between 1920 to 1945 begins a long run sustained increase in U.S. agricultural output. From 1930-2000 output approximately quadrupled, while land, labor, capital and other material inputs remained essentially unchanged. According to the USDA, "multifactor productivity (output divided by all inputs) rose by an average of about 2 percent annually over this period. This rate substantially exceeds the rate of multifactor productivity growth in manufacturing, and the agricultural rate did not experience the slowdown that occurred in the rest of the U.S. economy during the last quarter of the century."ⁱⁱ This was due to two key factors, further technological advances and economies of scale.

If we refer to the population charts 5.1-5.3 we can see that the U.S. population exhibits a steady growth between 1920 and 1945. When we examine the same metric for either Washington State or Skagit County we still see a positive growth, however it is increasing at a decreasing rate. This is indicated by the convexity of the function between the World Wars. The change is particularly evident in the case of the county where the function of population between 1900 and 1945 clearly exhibits fewer new residents per year. We can conclude that Skagit County growth was experiencing a significant slow down in this period when the country was steadily increasing in population. Referring to Charts 5.4-5.7 we can see that many of the trends in farm size and shape are reaching their apex. Regarding the size of Skagit farms during this period, we can see that the number of farms continues to grow, reaching its peak at the onset of World War II. Skagit county acreage and percent of county in farms also continue to grow, approaching their peaks as well. Conversely, the average size of Skagit farms is decreasing, representing a lowest value of below 50 acres prior to the onset of World War II. Each of these indicators shows a discontinuity during the 1920's. For instance, there is a sharp decline of farm numbers between 1920 and 1930 denotes the hardships facing agricultural producers as the demand for their products dropped after World War I. Like wise, there are drops in average farm size and county acreage in farms in 1925. The "golden age" of American agriculture ended with farmers experiencing significant drops in demand for their goods. The concerns of American farmers fell on deaf ears, "as the rest of the nation -- particularly urban areas -- enjoyed the prosperity of the 1920s. The period was even more disastrous for farmers than earlier tough times because farmers were no longer self-sufficient. They had to pay in cash for machinery, seed, and fertilizer as well as for consumer goods, yet their incomes had fallen sharply."^{liii} As overseas

population ravaged by war began to rebuild they needed fewer agricultural commodities from American agriculture. As European and Asian markets reestablished their food production and agricultural markets, the high prices driven by wartime demands diminished and world market prices began to drop. American agricultural representatives echoed manufacturing interests pushing for increased tariff protection. The eventual result was the passage of the Smoot-Hawley tariffs in 1930. American policymakers were not alone in escalating tariffs, “and world trade plunged. In the 1930s, the volume of U.S. agricultural exports fell by more than 20 percent from the previous decade.”^{liii} The turndown experienced by the farmers in the 1920’s would soon be felt by the entire nation as the world fell into the Great Depression.

These economic hardships can be illustrated in the context of Skagit County farmlands during the late 1920’s and 1930’s. If we consider the investments of land and buildings, two key forms of agricultural production capital, we can see a decreasing trend both in terms of value per farm and value per acre. Here, an increase in value of land and buildings by farm indicates an increase in capital accumulation by the individual farm. On a per acre basis, an increase denotes accumulation of agricultural capital on a countywide basis. These are important indicators because they show us the amount of capital used to implement agricultural production. County figures are detailed in the following charts:

Charts 5.19-5.20

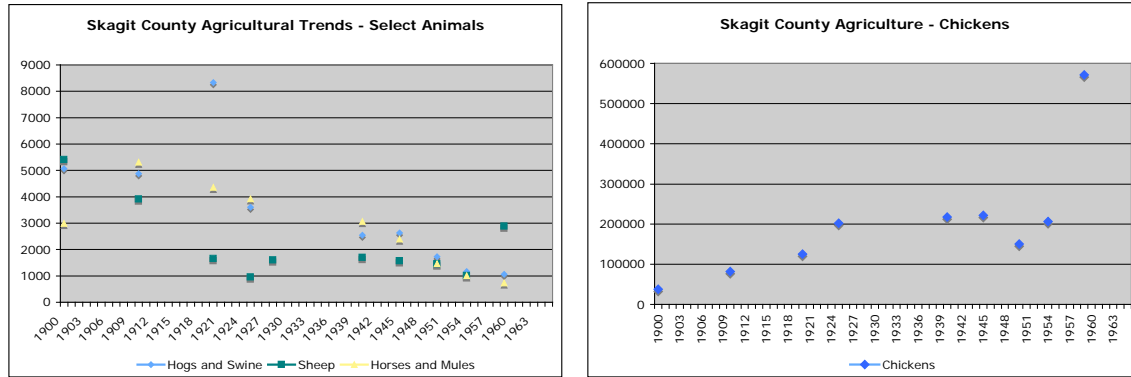


While we see an increasing Skagit County population, an increasing number of farms, and an increase in farm acreage we see a decrease in investment in two of the key components of the areas agricultural production.

By considering indicators of farm animal numbers we can define trends in the Skagit County farmers’ animal product production decisions. If we consider farm animal trends in Skagit Agriculture between the two World Wars we can note that generally there is a downward trend in hogs, pigs, sheep, horses, and mules. Besides one outlier for hogs and swine (likely high due to meat canning for wartime consumption) all indicators show a downward trend. Generally we can see a countywide shift from animal products, with the exception of chicken and dairy. The reduction in horses can be tied to continued technological advances. Gasoline-driven tractors continued to gain popularity during the era, “increasingly replacing the horse for farm labor.”^{liv} The standouts are chickens and cows. While the number of chickens remains fairly constant between the wars, cows (particularly dairy cows) experience an increase in numbers. Kirby Johnson commented

on the role of dairy during this period, "...milk carried us through the depression. We could use it for cash or trade. When times were hard we could trade with each other." In fact, dairy continued to occupy a larger and larger share of the agricultural operations of Skagit County production. These trends can be illustrated on the following charts:

Charts 5.21-5.22

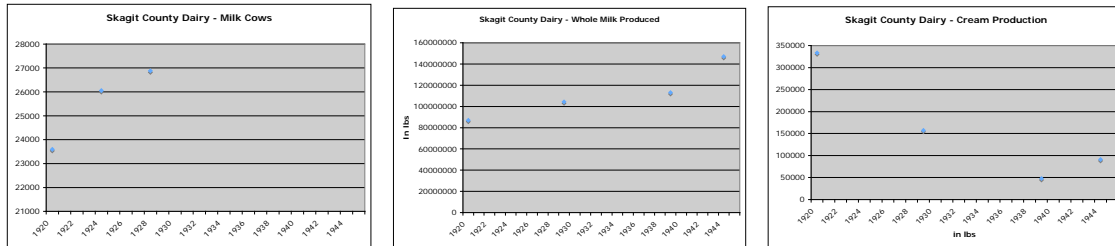


The dairy sector, in particular, illustrates the two key factors in Skagit County agricultural survival, technological innovation and economies of scale. Technical advances, as we have earlier discussed, result in fewer inputs required per unit output. Economies of scale, on the other hand, require fewer and larger farms with lower costs of production. Generally, economies of scale are described as the cost advantages of increasing the size of a business. This increase results in a fall in cost to produce the average unit. Unit costs generally drop because of an increase in production facility size reduces individual cost. Specifically, "economies of scale in agriculture mean (a) that the production function for the typical firm in the industry is characterized by increasing returns to scale, and (b) that small farms are less efficient than larger ones."^{lv} Both measures result in lower production costs, a necessity in competitive markets. Essentially, less labor (from increases in technology) and lower per unit production expenses (from larger scale production) present a platform from which agriculture can maintain production when faced with price increases in inputs and lower demand for goods. We have seen that in the U.S. agricultural sector, cost minimization and increasing returns to scale have kept the farmer in production, despite declining prices for their products and increases in the costs to operate.

This has been especially true in Skagit County dairy. Take for example, the technological part of this equation. As with most technology we are reducing the amount of labor (or other inputs) needed to perform the same work. Consider the herd milking process itself. With the introduction of compression and tube systems for machine milking dairy producers experienced increased milking capacities. Advances in herd management practices and onsite storage allowed the average dairy producer to collect and hold more milk. Now add in the effects of other technologies that added to the efficiency of the dairy industry included: 1) improved pasteurization processes resulting in longer shelf life, 2) improved transportation modes allowing more product to get to its destination in a shorter time, and 3) improved logistics of milk collection. The result was more milk for less per cow expense. Now consider then scale part of the equation. Some

smaller producers faced with the added expenses associated with new 10-gallon metal container milk collection practices and the costs of the breeding programs left the market. Dairy producers capable of increasing the income enough to stay in the dairy game did so by getting larger (resulting in more profits) and/or reducing costs per unit of good (by enrolling in the Darigold Cooperative or participating in cattle inoculation programs). The general effect is to lose smaller producers and gain larger scale operators. This is in fact what the data shows. Consider the following charts detailing an increase in the number of Skagit County milk cows and pounds of whole milk, and cream produced:

Charts 5.23-5.24



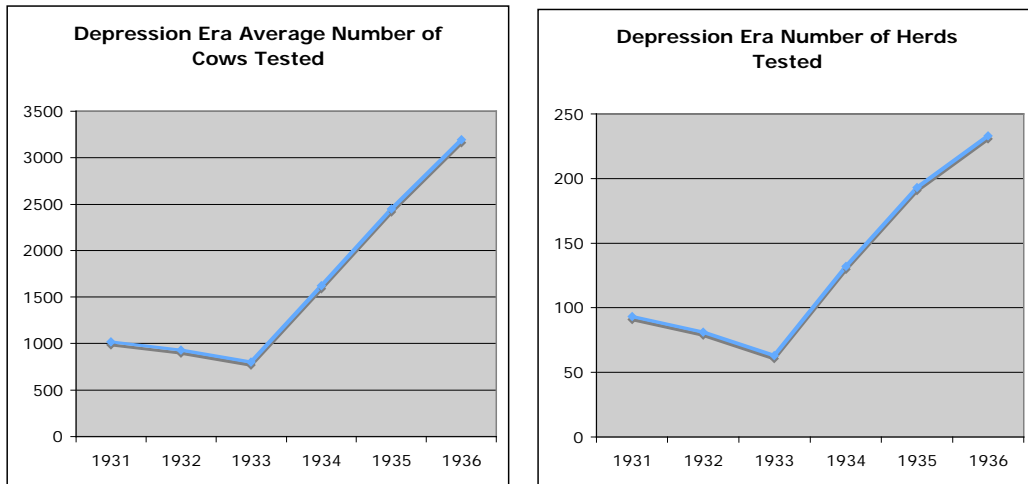
Here we can clearly see increases in the number of milk cows and in the amount of milk produced in Skagit County during the 1920's and 1930's. Note also the decrease in the amount of cream produced up to the onset of World War II. During the war cream production did experience an increase.

Skagit County agriculture enjoyed many of the benefits of technology. Other key innovations included more powerful and higher precision equipment and chemicals. Chemicals included better and less polluting fuels, higher strength and more specific agricultural chemicals like as fertilizers and pesticides. Examples were the nitrogen and super-nitrogen fertilizers and the 1939 invention of dichloro-diphenyltrichloroethane, or DDT which was initially very promising in pest control. Motorized vehicles such as tractors, trucks, and airplanes significantly contributed to the production and transportation of farm products. In the 1930's farmers were introduced to Allis Chalmers' All-Crop Harvester. This was a "diesel-driven combine with a capacity for mass-harvesting, but consumers still preferred the more affordable picker-sheller machines, which were more affordable if less advanced."^{lvi} After becoming commercially available by 1920 "trucks changed the marketing and production patterns of farm products. Their importance to harvesting the fields was paramount because they could haul items such as fertilizer, feed, crops, and livestock."^{lvii} Another significant development was portable refrigeration units that allowed trains and trucks to deliver fresh produce reducing rotting, carry freshly slaughtered meat to market, and deliver pigs to centralized meatpacking centers in the cities."

Another aspect of technical innovation in this era was the contribution of the U.S. Department of Agriculture in research and development. Measures included "new research, developing hogs that fattened faster on less grain, fertilizers that boosted grain production, hybrid seeds that developed into healthier plants, treatments that prevented or cured plant and animal diseases, and various methods for controlling pests."^{lviii} Again,

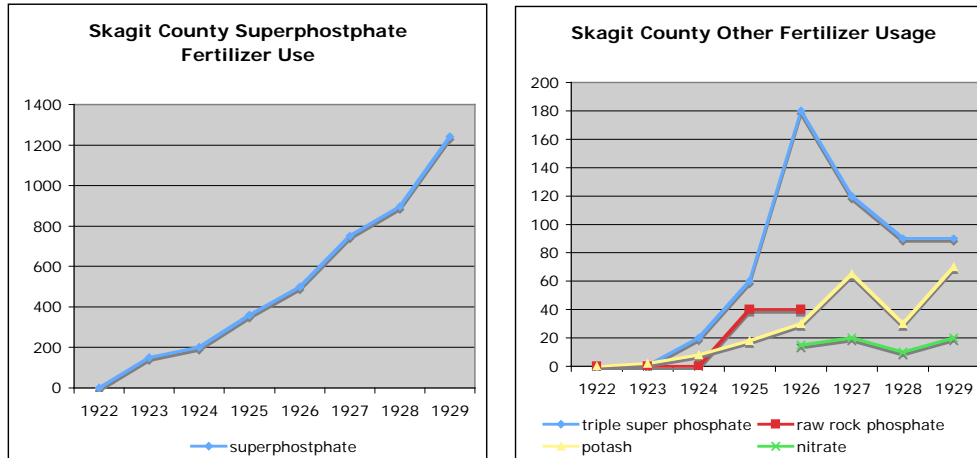
the USDA contributed to another aspect of Skagit County farming. The USDA also created the demonstration farms and the Agricultural Extension Service’s farm agents. These presented a community based catalyst for educational presentations demonstrating new techniques for improving crop yields. The extension service, “enlisted an army of agents to advise farmers and their families about everything from crop fertilizers to home sewing projects.”^{lix} The activities of the farm agents, extension workers, and cattle technicians are well documented in the archival reports from this era. The collection of farms agent workers begins in 1922 and continues on for half a century. Key citations that point to the work occur in references to technological innovations in fertilizer usage, crop and seed education, and support for cattle and dairy herd maintenance. Some of these programs are illustrated here. While it is not possible to show the exact numbers of cattle and their usage, it is possible to ideicate the increase in activity of the agent’s efforts. Consider the report of C. W. Krassin, the Assistant Extension Agent in Dairying, summarized in the following data:

Charts 5.25-5.26



We can clearly see that during the great depression there is an increase in the number of tests performed by the Dairy Herd Improvement Association and the extension workers. This can be interpreted as indicating the attempt of the dairyman to maximize agricultural production by improving the fertility and health of their herds. Again we see Skagit County farmers using technology to make more with the agricultural capital at their disposal. Other examples of Skagit County farmers using extension and other expertise include forage crop harvesting, 4H activities, agricultural engineering, marketing, and fertilizer usage. The tonnage use of various fertilizers can be shown in the 1920’s agent reports as follows:

Charts 5.27-5.28

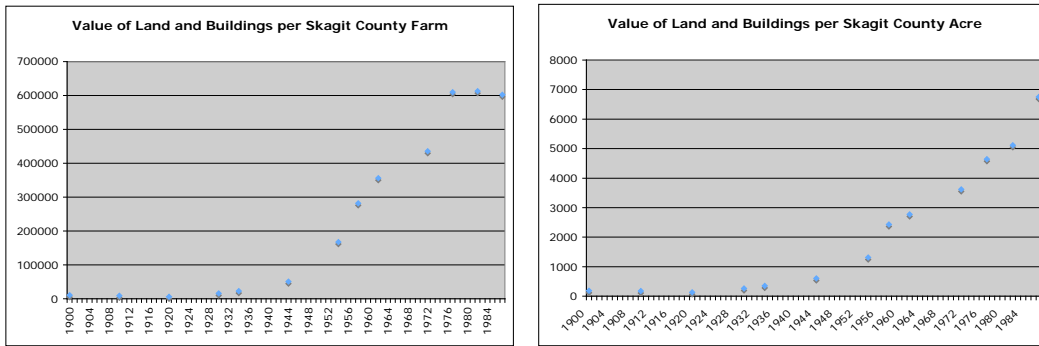


Another factor in Skagit County agriculture was the creation of widespread policy measures designed to relieve the depression era farmer. The first example of government intervention was in 1929, when the federal Farm Board was formed. Its creation, “represented the first national commitment to provide greater economic stability for farmers and set a precedent for government regulation of farm markets.”^{lx} Another measure was the Agricultural Adjustment Act (AAA) in 1933. This legislation provided farm price and income support programs that have been the core of agricultural policy in the United States. Though many of the specific crops supported (such as grain) were not significant in Skagit agriculture, other measures of the Act were emergency responses to other post-World War I economic problems in agriculture.^{lxi} These included measures, “that guaranteed farmers a "parity" price roughly equal to what prices should be during favorable market times. In years of overproduction, when crop prices fell below the parity level, the government agreed to buy the excess.”^{lxii} One New Deal initiative that aided rural agricultural producers was the Rural Electrification Administration. This program was created to extend electric power lines into the countryside. The federal government also built and maintained a network of farm-to-market roads increasing the accessibility of markets in towns and cities.

1945-1965

To meet the World War II war effort Skagit County provided both individuals and agricultural commodities. During the war, farmers again found themselves answering high wartime demands. These demands again bolstered agricultural prices, spurring production with fewer workers. The use of stronger chemicals, pesticides, fertilizers, stronger machinery and newer methods of harvesting continued to make each unit of land more productive. After the war however, farmers faced many of the problems experienced after World War I. Primarily, demands for American agricultural goods slumped, resulting in overproduction. Refer back to the amount of agricultural capital investment and accumulation in Skagit County farms. Considering charts 5.29-5.30 we can see that the postwar period experiences steep gains from 1945 to 1950, while the investments per acre didn't experience the same increase until 1950. One interpretation of this jump in farm spending was an attempt to produce more by reducing per unit costs.

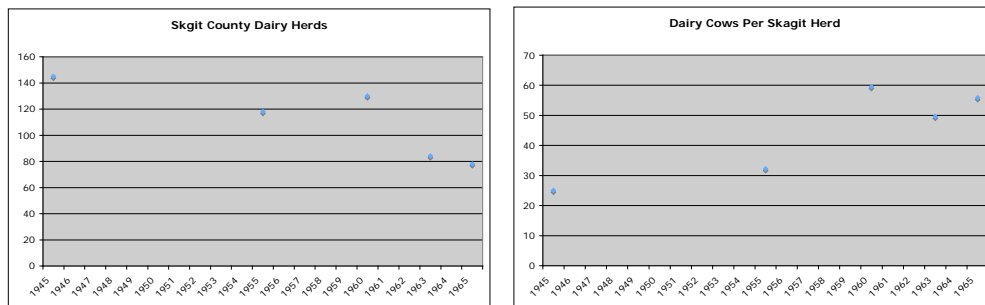
Charts 5.29-5.30



Many agents noted the agricultural economies of scale during this period. County agent Vey J. Valentine^{lxiii} recorded another significant development in Skagit agriculture in October 1947. Addressing general changes in Skagit County he noted a gradual change, “from individual independent farming, to corporation farming. Large canneries and freezing companies are attempting more and more to rent lands and operate them, or furnish seed and fertilizer and labor to farmers who grow a crop themselves.”^{lxiv} The agent went on to note other key aspects of agricultural economies of scale, “they operate centralized vining stations for peas, they process the crop in centralized plants. The farmer falls for the program because he does not have to put up cash for growing a crop. The farmer's wife likes the program because she does not have to feed large crews for several weeks on their own farm. The Farm Labor program promotes corporation farming.”^{lxv}

Statistical figures that confirm this trend are the number of Skagit County dairy herds and the number of dairy cows per herd. Note that these figures do not include cows used for the production of meat products. Generally we can see a trend in the decrease in the number of dairy herds and an increase in the number of cows per herd that define agricultural economies of scale. This trend can be summarized as dairy operations concentrating. According to Oscar Loggarland, “Smaller Skagit Dairies disappeared, and they sold off their cows to the bigger farms. The big dairy operations started to do well.”^{lxvi} Consider the following charts:

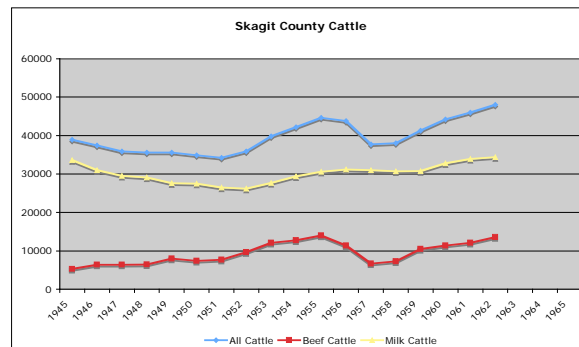
Charts 5.31-5.32



Further evidence of the labor impact on dairy was reported by county agents in October, 1951. They noted that the main reason for the continued dissipation of county herds was the labor loss situation. Specifically, they note, “Several herds sold because of the sons

being drafted into the service... The milk price hasn't risen in comparison with the feed and labor costs. This together with the labor situation has caused the decline in cow number sin this area.” The agents also note the trend towards larger dairy units and newer and larger milk holding tanks and large scale milking parlors. Again, economies of scale prevail as the dairyman strives to stay competitive. Agent Valentine also noted that farmers were gaining interest in livestock because of the price of beef and the shortage of (crop) labor. Consider the indicator describing trends in cattle numbers in Skagit County. This shift is shown by the increase of beef cattle at the same time there is a slump in dairy cattle:

Chart 5.33

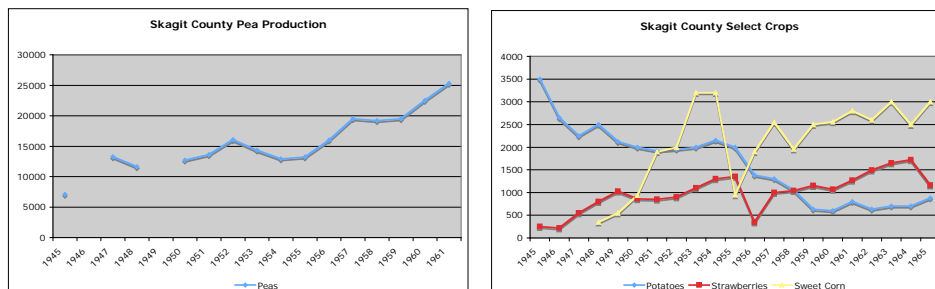


Referring to the population charts 5.1-5.3 we can see that Skagit County and Washington State both experienced an increase in population after their slumps between World Wars. One interesting note regarding population during World War II was that a position was created in local county government to oversee the emergency shortage of labor. This became a significant issue in Skagit County agriculture as many people working as farm laborers before World War II were no longer available. To fill the void left by local farm laborers now in the service, farm agents sought emergency workers. Common alternative labor sources were Skagit County women, before school pupils earning Victory Harvest badges, individuals seeking work at industrial centers, and off-duty sailors from the Whidbey Naval Base. By the 1945 busy season farm labor agents noted that these measures were not enough. Two additional sources of emergency workers were the Mexican Braceros, or farm workers, and Canadian Indians. The Emergency Farm Labor Field Assistant Richard J. Passage recorded specific notes regarding the agricultural labor force in Skagit County. He reported on recruiting trips to British Columbia for agricultural labor. This labor was in short supply, but as the delegation returned home they found 350 Mainland Indians reporting for work in the berry fields near Conway. These camps were a mainstay of agricultural labor during the period. An interview with McMoran reported that Indians from Canada would travel in camps from work site to work site.^{lxvii} This practice of workers being coordinated between crops began in the depression, as farmers found more ways to be efficient with their labor. McMoran asserted that the Indians were the effective in moving to the various crops and setting up camps. These camps were well documented by the farm and labor agents throughout the 1940s and 1950s. He also noted that by the 1950s the agricultural labor was mostly Mexican. One possible cause for the reduced role for the Canadian Indians was the increase in agricultural outfits in Eastern Washington due to the Columbia River Federal

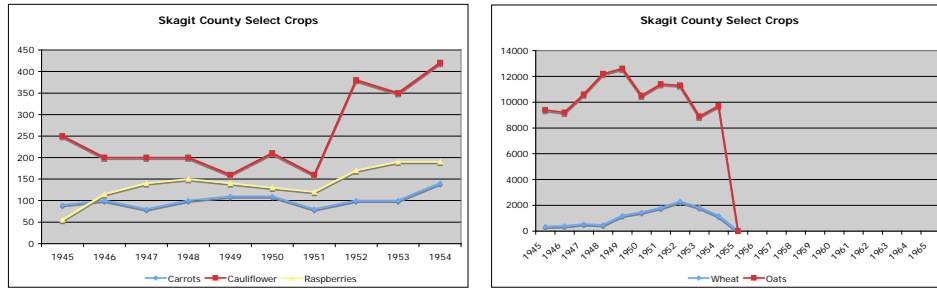
Reclamation Project. These locations were closer to interior Indian Reservations, the traditional seasonal fishing and berry camps in Kettle Falls (Washington) and Fisher Creek (Montana and Idaho), and the other mass consumers of Indian labor – the Columbia’s growing hydroelectric dams. These included Chief Joe and Ground Coulee, both central to the hops and apple harvesting farms and much closer than Skagit County locations. In interviews^{lxviii} with representatives of the Sauk Suiattle Tribe noted that some Indian families took to the work because it allowed a semi-nomadic lifestyle. Norma Joseph^{lxix} added that the Native people from Skagit County continued to travel not only between coastal communities, but across the mountains as well. At the same time more braceros were brought to Skagit County from Mexico they established firm foundations in the community. They were first assigned in large numbers to help harvest the hay and pea crops, important to the dairy industry for fodder. The Braceros camp at Burlington was the largest mobile camp in the United States.^{lxx} Agent Passage also noted that when Mexican Nationals arrived their numbers necessitated camp supplies, small convenience stores, medical drugs, tobacco, and Spanish-English dictionaries. Soon, dairy and poultry farmers began hiring the migrant workers between the berry seasons, noting that some Mexicans make excellent dairymen.^{lxxi} This shift in labor from Canadian Indians to Mexican Nationals signaled the establishment of a longstanding Mexican migrant worker community in Skagit County.

Farm agent reports signaled other important trends in Skagit County agriculture. In the 1948 report, county agent Valentine again spoke to the changing face of Skagit Agriculture, “1946 was a very irregular year for Skagit County agriculture. We have always had a high dairy and poultry income, but due to the constant pressure of growing cash crops during the war years and since, many of our dairymen have weakened. They have collected as high as \$40 and \$50 per acre cash rent, or they have gone into more berries and vegetable seeds and freezing and canning crops.”^{lxxii} Consider the crop trends indicators denoting the amount of various fruits and vegetables produced. We can see increases in rent seeking behavior of dairy producers by focusing on the acreage of peas, wheat, strawberries, sweet corn, carrots, cauliflower, and raspberries. Of the total agricultural acreage we can see a greater percentage of croplands. Note the standouts (oats and potatoes) in the following charts.

Charts 5.34-5.35



Charts 5.36-5.37



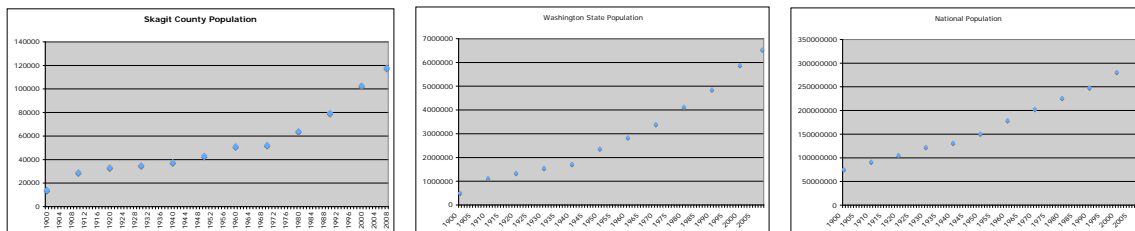
Other notable reports show berries as the principal fruit, and tree fruits as mainly for home use. Peas continue to be the principal vegetable crop, with corn, squash, beans, broccoli, and cauliflower as significant as well.^{lxxiii}

Other notable developments cited by agent Valentine’s^{lxxiv} report also spoke to the advances of the New Deal programs in improving the amenities of farm utilities, “we may be gradually getting away from the dairy business. We are certainly getting into fruits and vegetables more and, more. Farming is on a high standard of living right now. One half of the farms on the delta land have city water. All have running water and electricity.” Further, the agent notes the role of the extension personnel, “One of the big jobs of extension, is to meet these changes. We will have to have more demonstrations for the new farmers on cut over land. More home demonstrations clubs, and more 4H clubs among the marginal farmers. More work through the larger operators, meeting their various groups of growers.”^{lxxv} Here we can see the farming community reaping the benefits of the physical infrastructure and continued technical assistance.

Another factor favorable to agricultural producers during this period was demand for agricultural commodities. Several measures were designed to consume surplus crops, which were depressing prices and costing taxpayers money. Congress in 1954 created a Food for Peace program that exported U.S. farm goods to developing countries. Other uses of surplus foods were to feed America's own poor as well via the Food Stamp program and for school meals for needy children.

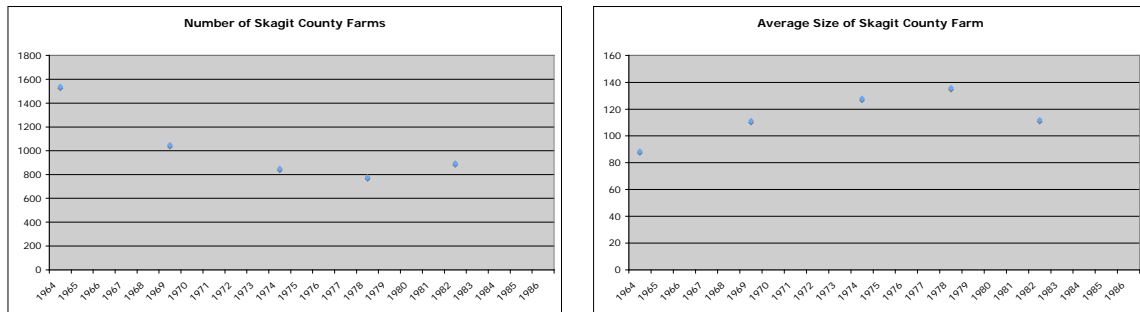
1965-1985

Consider the earlier population charts 5.1-5.3:



At the beginning of this period the population of Skagit County was around 52000 and in excess of 70000 at the end of the period. While Skagit County did witness a positive rate of population growth during this period it should be noted that the growth was not constant. Notice the lull in population growth between 1960 and 1970 evidenced by a near horizontal slope. After this decade there is a significant increase in slope that converges to a similar rate of growth for both Washington State and the national population. Other studies note (but do not explain) the occurrence of a population dip in 1975.^{lxxvi}

Possible reasons for this dip may be related to the reduced attraction to farming caused by trends of farming in the 1970s. Two key factors in diminishing agricultural draw were the “deficiency payments” and the growing interest in off-farm income for farm families. Deficiency payments, which began in 1973, “were designed to work like the parity price system. To receive these payments, farmers had to remove some of their land from production, thereby helping to keep market prices up.”^{lxxvii} Concurrently, off-farm work gained in popularity for farming families, again reducing the agricultural attraction. During this period it is estimated that more than half of farms had off-farm income.^{lxxviii} These may have played a significant role because of Skagit County’s reliance on the agricultural sector for income. Consider the indicators describing Skagit County farms and farm sizes:

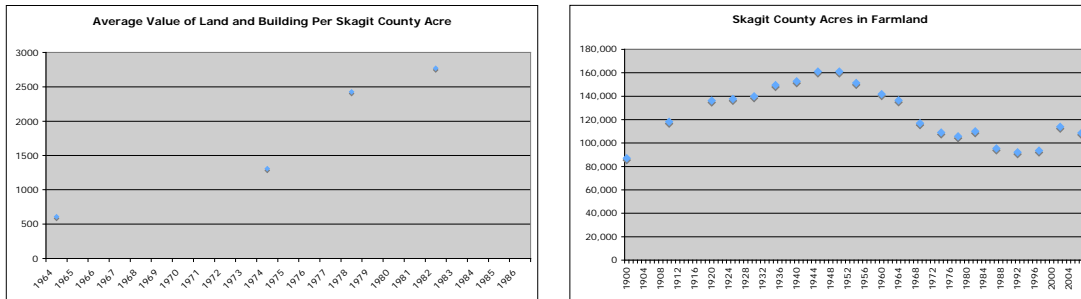


During this era we can also see significant changes in trends for both the number of farms and the size of the farms. Each category reaches its respective apex around 1978 (possibly related to the 1975 population dip). For the number of farms we can see that the diminishing trend that began earlier in the century begins to increase by the onset of the 1980s, indicating an increase in the number of farms. Concurrently, we can also see that the average size of the Skagit County farm peaks in 1978 measuring just below 140 acres per farm.

One possible source of these vertices is the diminishing role of technical innovation in the latter half of the twentieth century. Until this time farmers were able to utilize mechanical and chemical fast-paced innovation to do more with the land they were tending. Tractors and fertilizers were allowing farmers to plant more acres, invest in more capital, and harvest more crop and animal products. But eventually the returns on technical innovation decrease. The innovation that spurred the increase in farm size was increasing at a decreasing rate. Essentially the foundation for agricultural economies of scale was exhibiting less of an effect as the returns on innovation diminished. 1978 may

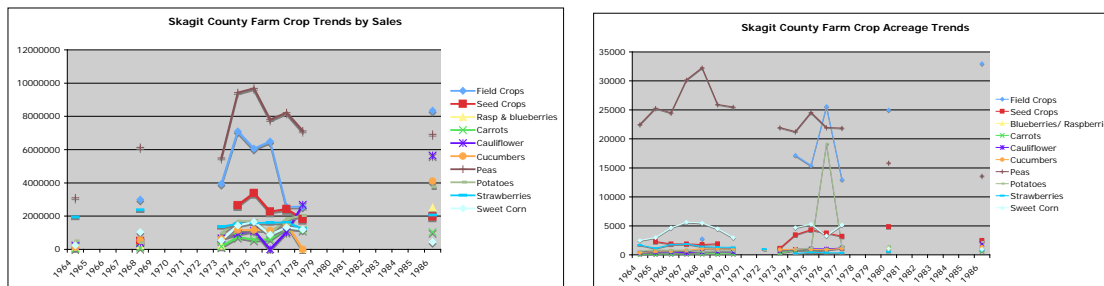
also denote a constricting combination of decreasing returns to technology, increasingly more expensive (and some argued inefficient) price supports, and increasing petrochemical costs effecting gas, diesel, pesticides, fertilizers, etc. These challenges may have offset increased trade fueled by a strong dollar and new Soviet trading partners.

Next, revisit the value of agricultural capital (land and buildings) per acre, total county land in farms, and trends in crops by acreage:



Here we can see a dramatic increase in value of agricultural capital per acre beginning in 1975. At the same time we can see that there are fewer acres in farmland. In other words farmers are increasing the agricultural capital resources per acre as the total acreage is falling. This concentration is accompanied by significant decreases in certain crop acreages: peas, seed crops, corn, strawberries, and carrots. Concurrently, we can consider crop trends in terms of sales:

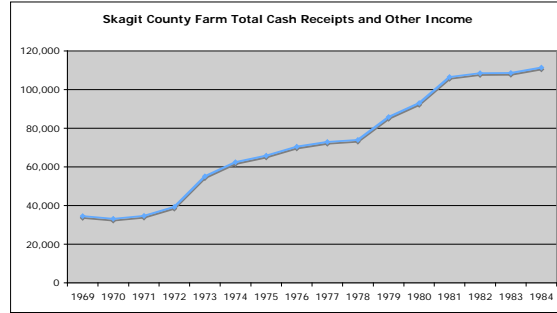
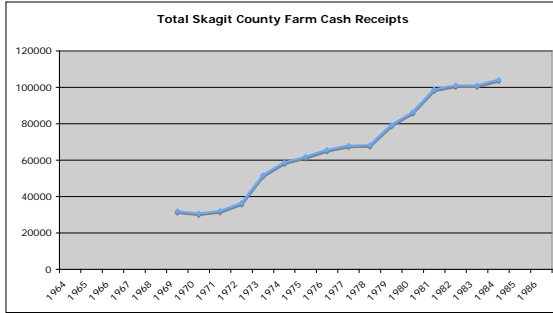
Charts 5.36-5.37



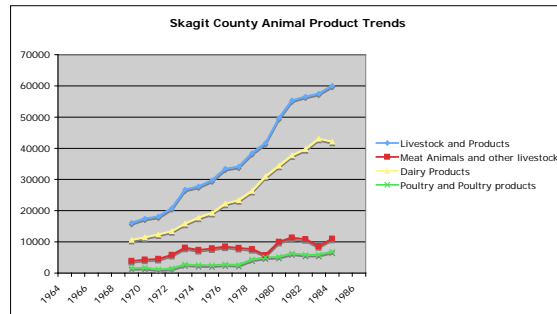
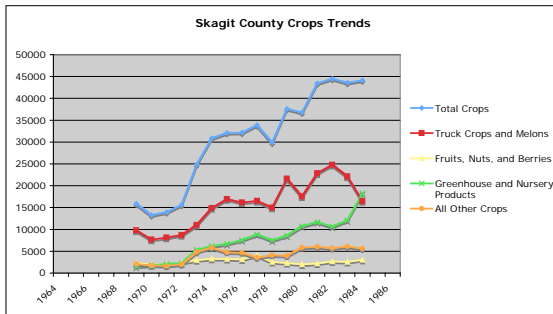
Notice here that we see constant carrot, pea and field crops sales, and increased sales in cauliflower, cucumbers, potatoes, and berries. Generally we can see a trend starting in the mid- 1970s and continuing to the 1980s where fewer acres are being used to grow crops that are increasing in total sales.

Other trends worth noting in this time period are Skagit County farm income, farm cash receipts, crop trends, and animal product trends:

Charts 5.38-5.39



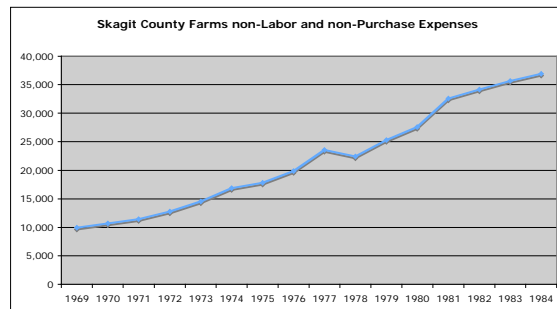
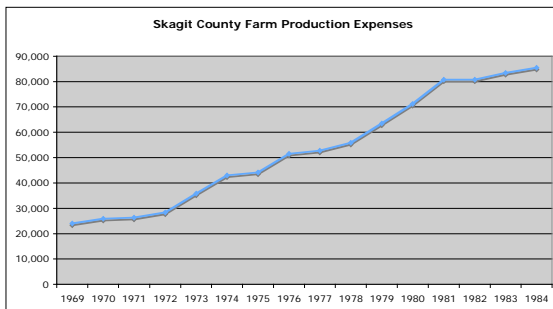
Charts 5.40-5.41



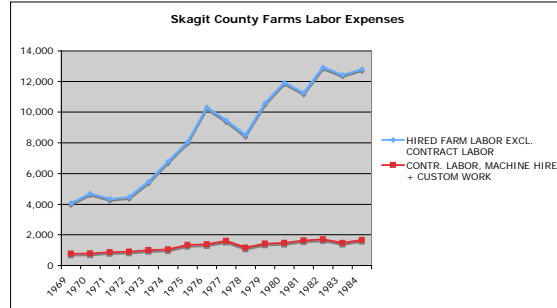
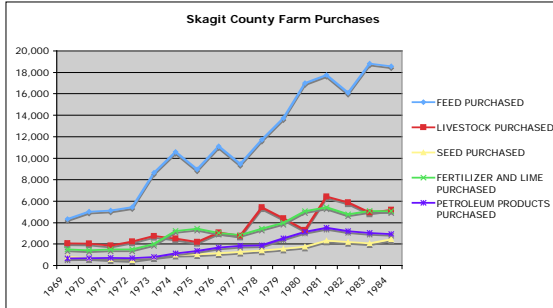
We can see a steady increase in each of these categories. Income, receipts, and animal trends look relatively constant, however truck crops and melons appear volatile.

Next consider the various expenses of the Skagit County farmer. These indicate the total farm production expenses, farm expenses not associated with wages or purchases, farm production expenses, and labor expenses:

Charts 5.42-5.43



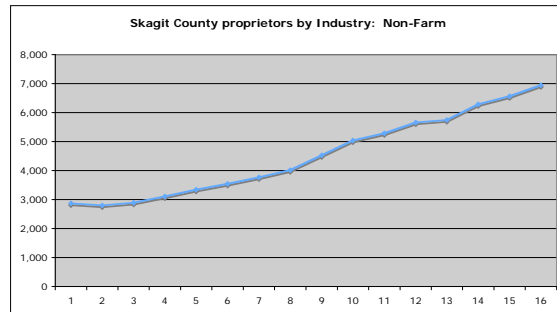
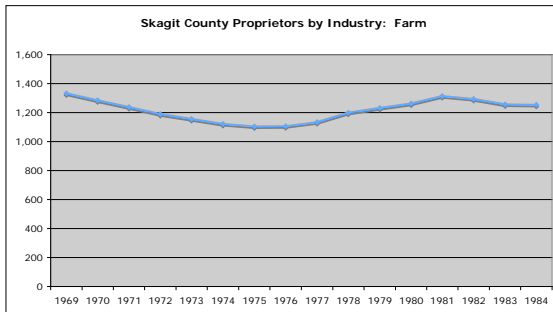
Charts 5.44-5.45



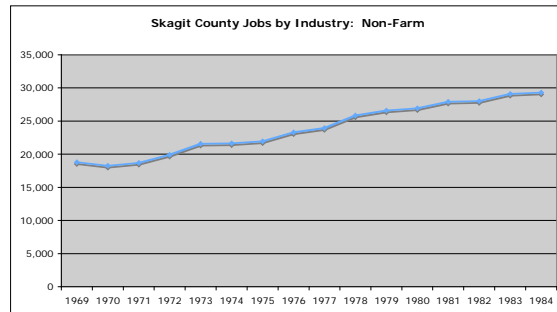
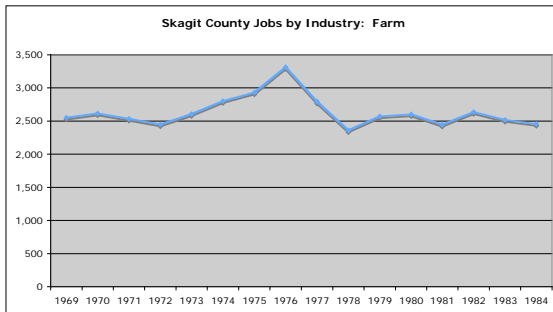
The Bureau of Economic Analysis's Regional Economic Information System collected these indicators in 1986. They are measured in thousands of dollars. Though we see cyclical volatility in feed purchases and non-contract hired farm labor, generally we see a trend of gradual increasing farm expenses in the other categories of expense. This can be interpreted as an increase in the general operating expense of the Skagit County farmer. This time period is like the others in that farmers are forced to do more with less.

The Regional Economic Information System also tracked proprietors by industry and the jobs per Skagit County industrial sector. These indicate the numbers of Skagit County agricultural and non-agricultural business owners, and the number of farm and non-farm jobs.

Charts 5.46-5.47



Charts 5.48-5.49



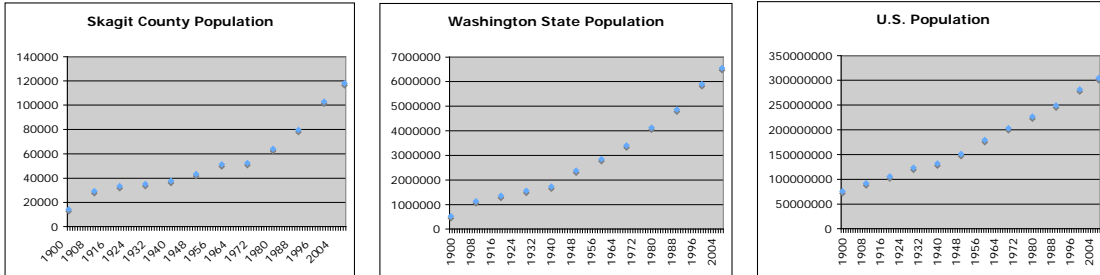
We can see that even though the number of non-agricultural business proprietors increases, there is a considerable fluctuation in agricultural proprietors. Similarly we can see fluctuations in farm jobs accompanied by constant growth in non-farm industry jobs. Note a loose negative correlation between the number of farms proprietors and the number of farm jobs. One interpretation here is that as the number of farm owners decreases, the number of farm workers increases. This may be an indicator of the

agricultural economies of scale in that fewer farm numbers are resulting in larger job totals as large scale farmers are incorporating the specialized laborers previously proprietors themselves. In fact if the farm proprietors were to transfer to the non-farm sector as proprietors we should see a fluctuation in the non-farm proprietor totals.

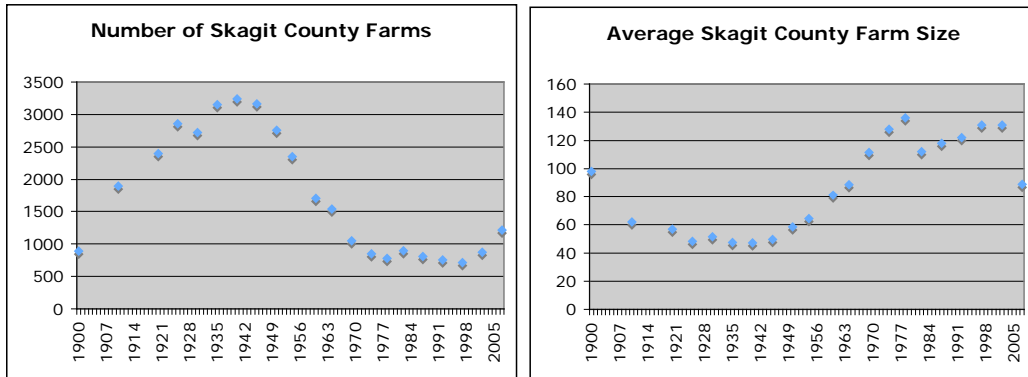
1985-2007

Farm Structure Indicators

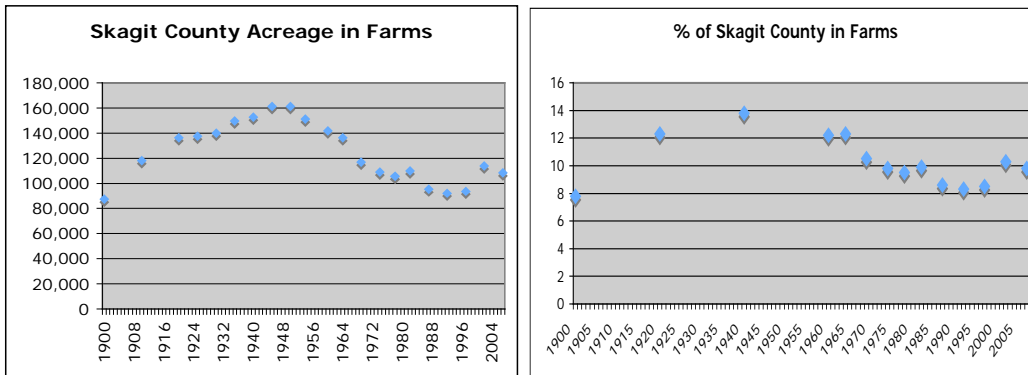
Charts 5.1-5.3

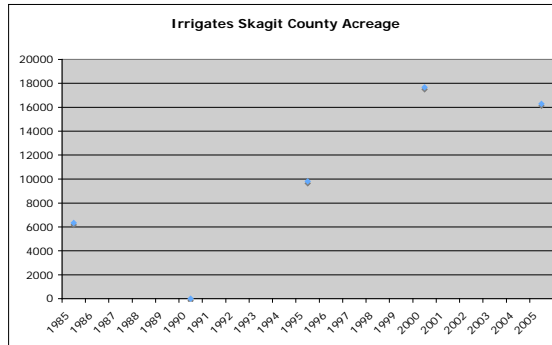
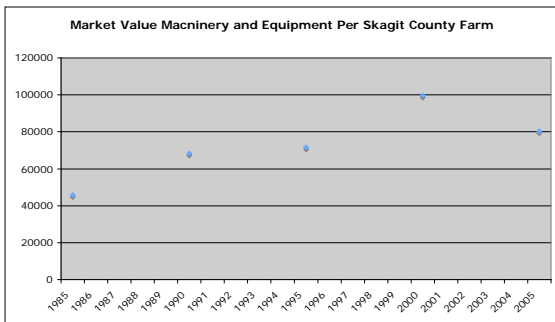
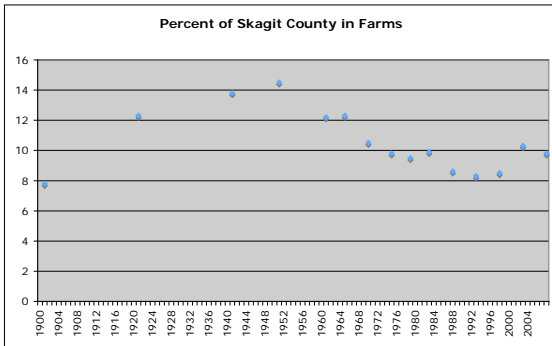
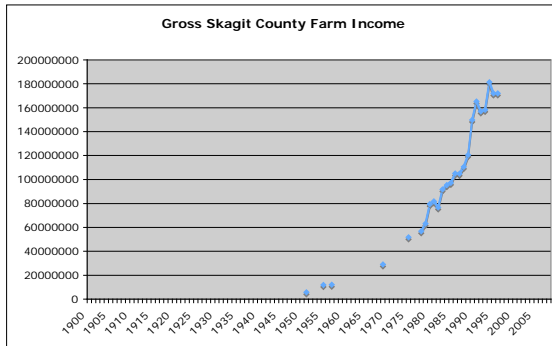
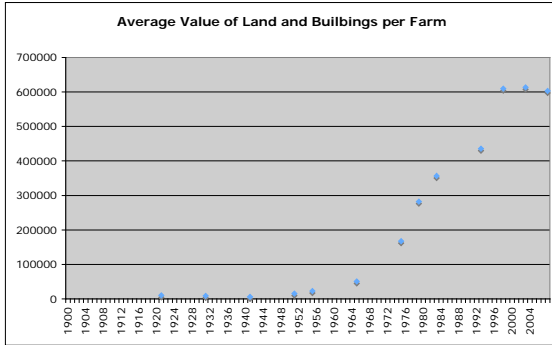
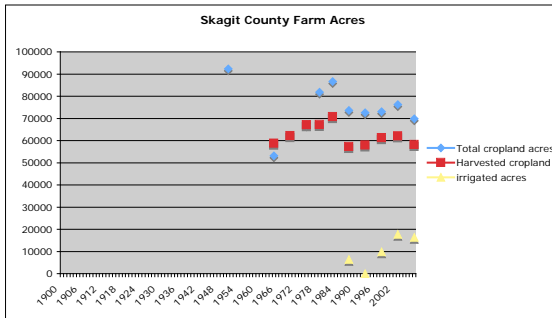
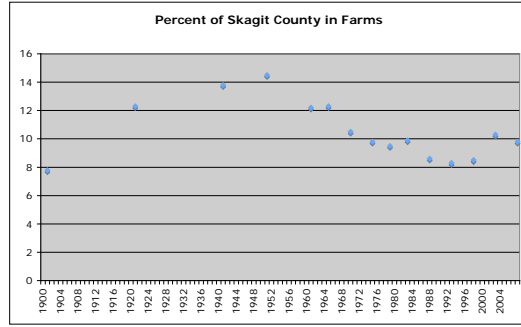
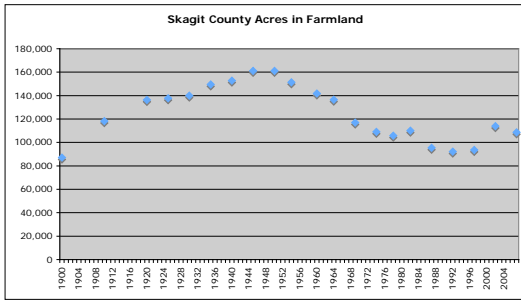


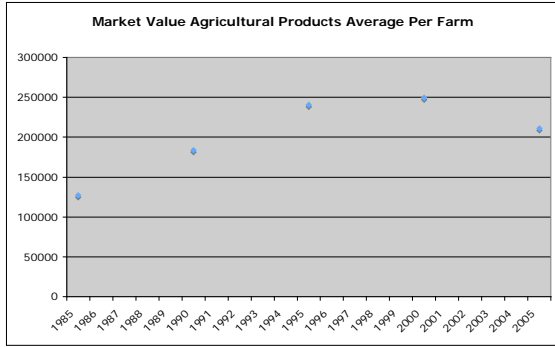
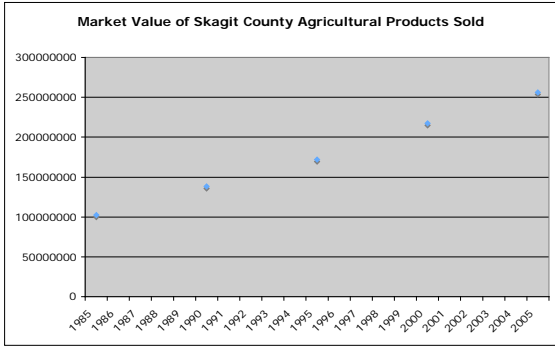
Charts 5.4-5.5



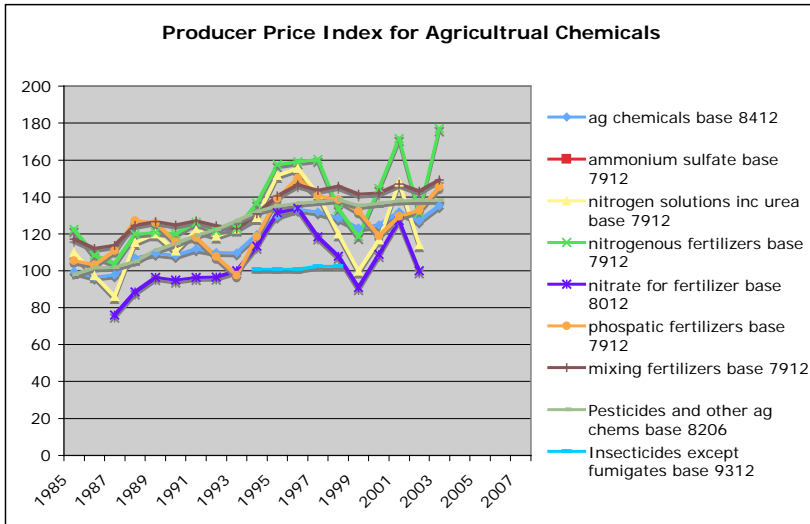
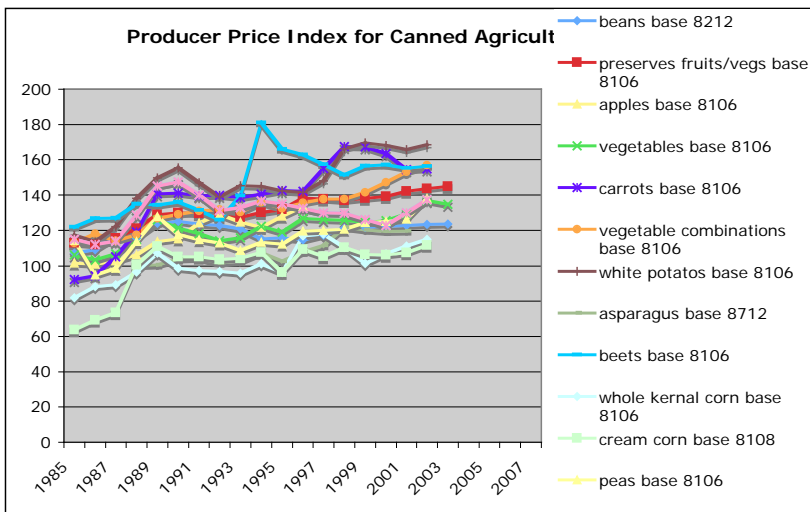
Charts 5.6-5.7

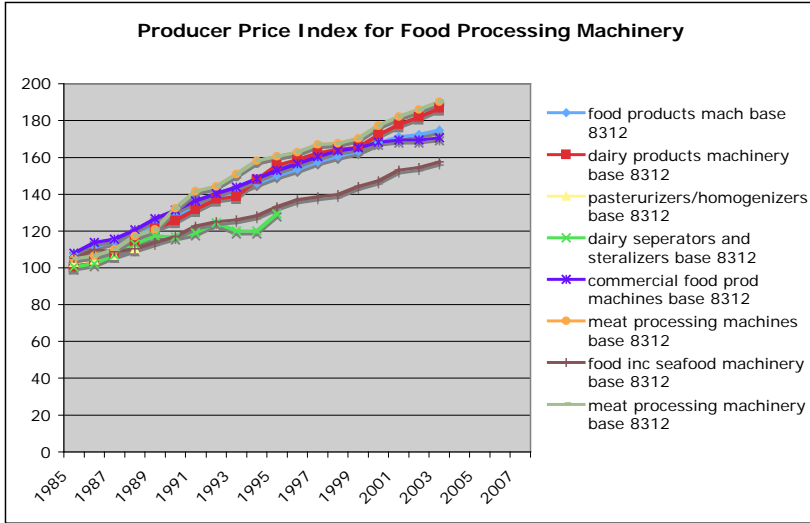




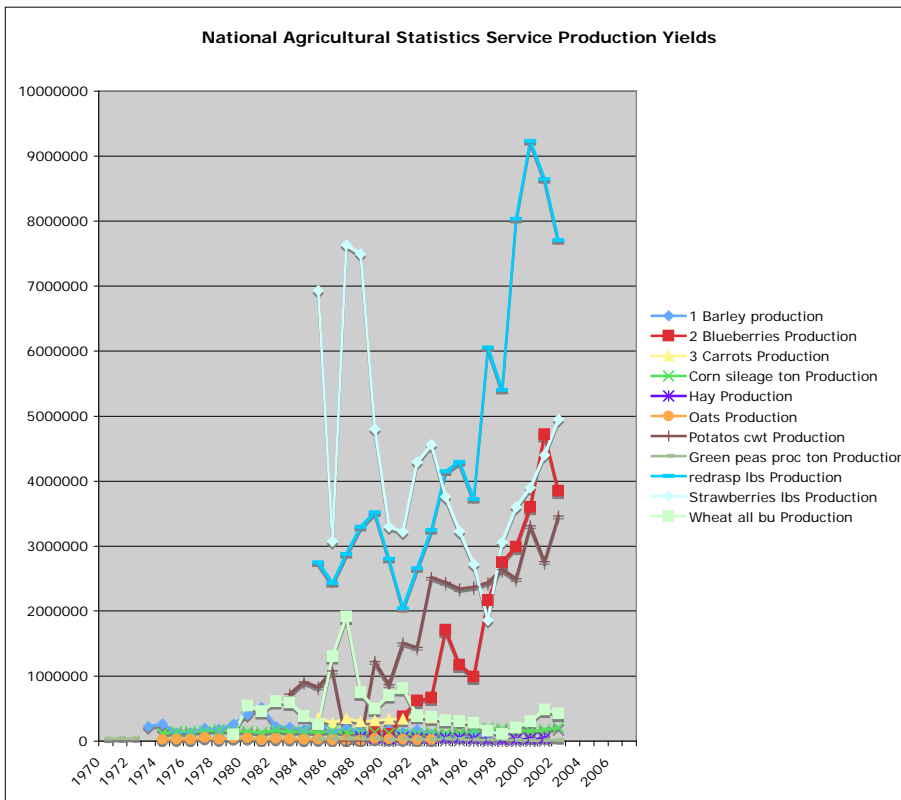


Time Period PPID Charts





Time Period National Agricultural Statistical Service Figures



Section 6 - Conclusions

Conclusion

Overall, farmers found ways to adapt to the changes of the last century. Those who remained in agriculture increased their efficiency by expanding and specializing their operations to take advantage of economies of scale, or by identifying niche markets to maintain profitability. Others moved out of farming and into other enterprises or occupations, or combined farming with off-farm work, with other family members tapping different sources of income. In some cases, farming has become a secondary occupation, providing a preferred lifestyle rather than a primary source of income.^{lxxix}

As the new century gets underway, technological development and market integration remain forces of change, and their influence, along with that of consumers, appears likely to continue. The structure of farming continues to move toward fewer, larger operations producing the bulk of farm commodities, complemented by a growing number of smaller farms earning most of their income from off-farm sources, all increasingly affected by global events^{lxxx}

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