

5 AGRICULTURE ANALYSIS

A. INTRODUCTION

Shenandoah County has long-standing tradition of being an agriculture-focused community. The land use patterns reflect this tradition, with 39% of all land in the County dedicated to farm operations. In 2017, the County ranked as the fifth largest agricultural producing county in Virginia, totaling \$142 million in market value of products sold. RKG analyzed the U.S. Census of Agriculture data from 2002 to 2017 both at the state and county level to provide insight into Shenandoah County's agricultural sector. This section will look at farm size and types, sales trends, and operational trends that have happened in the study period in Shenandoah County. Additionally, RKG has performed a SWOT (Strength, Weakness, Opportunities, and Threats) Analysis regarding the agriculture economy within the County.

B. MAJOR FINDINGS

Shenandoah County has seen a substantial growth in small farms and a slight increase in larger farms. Farmers under 10 acres saw a 135% increase in the past 15 years. This growth comes from a growing trend of retirees purchasing agricultural land to build estate homes and the subdivision of farms as they are passed down to children. This trend has been met with opposition from some portions of the farming community, seeking to preserve agricultural land. However, others within the farming community want to preserve this option, enjoying the higher land valuation that estate development provides when they chose to stop farming. Also, more farms that are 500 acres or larger in year 2017 than existed in 2002. Presumably some mid-size farmers left farming and leased or sold their land to larger farmers.

Poultry is the primary agriculture industry in Shenandoah, and it is growing stronger. According to the 2017 Census for Agriculture data, 81.3% of all animal sales from Shenandoah County are poultry-related. Poultry (including eggs) revenue has increased by 117% since 2002. There has been a noteworthy increase in the number of small scale (or small farm) layer and broiler operations since 2002. The number of layer operations has grown from 28 in year 2002 to 124 in year 2012. All these operations are small farm operations with inventory of less than 400 head. There are an additional 22 small scale farmers selling broilers, with a slight increase in the number of larger scale broiler producers (and resulting number of broilers sold) and a slight decrease in the number of larger scale turkey producers. This coincides consumer consumption shifting towards low fat proteins over the past twenty years. Industry research indicate the growth in chicken consumption will continue into the near future.

Acreage dedicated to Corn and Soybean production has steadily increased in the County. A portion of the increase in corn acreage is due to farmers shifting from hay to corn due to better profitability of corn production. The loss of land in apple orchards (from 2,497 acres in 2002 to 998 acres in 2017) due to poor profitability of orchard production also contributed to this increase. New federal regulations encouraging corn production for energy usages also may have played a role in this transition.

Shenandoah County farmers have invested heavily in machinery since 2002. The agricultural community invested heavily in machinery, increasing total value of machinery in the County by \$62.5 million between 2002 and 2017. This increase is disproportional to machinery investment statewide. The increase in machinery use likely has contributed to the corresponding increase in sales yield.

Agritourism has continued to grow as an economic engine for Shenandoah County. The Census data indicate that agritourism revenues have increased approximately 1000% since 2002. Much of this increase results from the County's growth in fermented and distilled beverage manufacturing. However, other farmers are seeking ways to increase revenues through direct marketing and creating recreational experiences on their farms to take advantage of consumers being willing to travel and spend for experienced based agricultural retail offerings (i.e. pick-your-own). The County should continue to develop and assist these types of ventures.

Other noteworthy changes in Agriculture since 2002:

- Goat production has increased in Shenandoah County. The expanding ethnic population in the region has improved the market for goats. As a result, there has been an increase in goat production.
- The number of bee producers has increased, with most of these are small-scale producers.
- The number of vineyards, wineries and acreage under grape production has grown substantially.

C. METHODOLOGY

1. Data Sources

The agricultural study for the Strategic Economic Development Plan Update includes an analysis of the land use, sales trends, and operational trends. The agricultural data came from the United States Agricultural Census. This analysis included the Agricultural Census for 2002, 2007, 2012, and 2017. Also, this analysis used the Virginia Agricultural Statistics 2017 Annual Bulletin, which is compiled by the United States Department of Agriculture's Virginia Field Office. Additionally, RKG utilized reports from IBISWorld market intelligence reports from all the major agricultural sectors within the County.

D. LAND USE ANALYSIS

1. Farmland Use

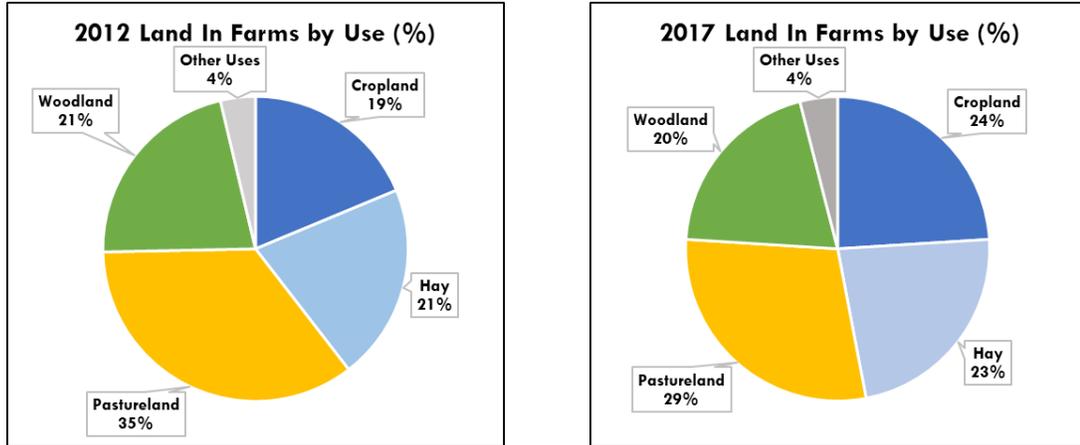
The total amount of farmland is an important indicator of where the agricultural industry is trending in a market. The State of Virginia saw a loss of both total farms and total farms acres over the past 15 years, whereas Shenandoah County experienced slightly less loss of both values. Between 2002 and 2017, the State of Virginia saw the total number of farms dropped by 9.2% (or 4,381 farms). Shenandoah County saw its farm count decline by 2.4%, or 24 farms. The Agriculture Census indicates there are 965 farms in Shenandoah County. Overall, acres dedicated to agriculture throughout the state declined 9.6%, or 826,850 acres. The implementation of the ag/forestral district within Shenandoah County have helped the county only experience a 1.8% loss, or 2,373 acres in agriculture land. All farms over ten acres, saw a decrease in the total amount of operations over the past five years. Shenandoah did not experience such a significant drop in acres compared to the state.

Poultry farming saw an increase from 95 farms in 2002 to 180 in 2017. Much of this growth has come from poultry farms with up to 400 total heads. This shift reflects the significantly lower cost for both consumers and producers of poultry compared to other direct protein competitors. The poultry industry has benefited from Americans changing their eating habits to more health-conscious protein choices.

Farms under ten acres saw a 135% increase over the study period, now totaling 139 farms. Local real estate professionals indicated this growth in small farms is the result of retired farmers (or their heirs) breaking their farms into smaller tracts to be sold as estate homes. Market data indicate there is steady

demand from Baby Boomers seeking to purchase a picturesque lot to build a large estate home within close-proximity to I-66 and the Washington DC market. RKG learned that these estate developments are owned by retirees or near-retirees that build their home on the lot and lease the rest of their property to active farmers.

Figures 5-1 and 5-2



Source: U.S.Census of Agriculture and RKG Associates, Inc., 2019

2. Agriculture Land Use

Within Shenandoah County agricultural land is split into four main groups. As shown in Figures 5-1 and 5-2, pasture and hay land constitute the highest percentage of agricultural land within the County. Between 2002 and 2017, Shenandoah County saw an 52.2% rise in land used for Agronomic Crops, while at the same time pastureland and land in orchards decreased. This type of land use now accounts for 15% of total farmland. This shift towards cropland follows the growing trend of farmers selling their land to residential developments. As cattle rearing is not financially viable on smaller plots of land and non-farmers do not want poultry houses near their homes, the non-residential portions of these former farms are more likely being used for small-scale goat/horse rearing and crop production.

3. Pastureland Use

As mentioned previously, as total pastureland has fallen over the study period. Between 2002 and 2017, Shenandoah County lost approximately 7,000 acres in pasture. Based on other agricultural trends, some of this acreage went into cropland, some of it was converted for residential use, and some of it probably is sitting fallow or is back in timber.

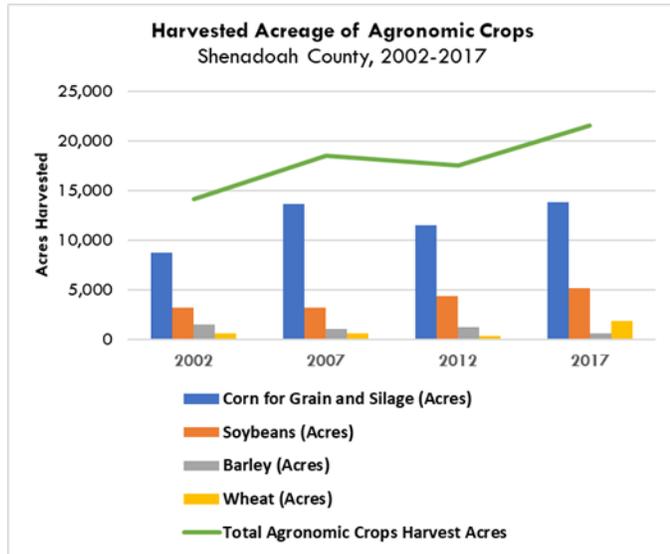
That said, those lands continued being used for pasture has experienced some transition. Poultry farming has continued to dominate pastureland use in Shenandoah County. Poultry is a large piece of the entire Virginia economy, making up 3% of all poultry production in the country. Over the past 15 years, Shenandoah County experienced an 89.5% increase in poultry farms totaling 180 farms. In addition, other pasture uses have increased including horses and goats.

Conversely, cattle pasture land experienced a 22.9% decrease in total acres over the study period, with the number of head of cattle in Shenandoah County declining by approximately 3,000 between 2002 and 2017. At a base level, the economics of cattle ranching has become less profitable versus other pasture uses (particularly poultry). Furthermore, the recent trends of farms being subdivided into estate home developments (at 10-20 acres per lot) makes cattle ranching on those sites infeasible due

to their smaller size. This transition is not just locally-driven, as this decline also follows a two-decade trend in lower beef consumption in this United States. This 20-year consumption decline has been largely attributed to medical studies suggesting a link between red meat consumption and heart disease and cancer. Furthermore, heavy levels of volatility in cattle pricing markets have led some farmers to leave the industry.

The County does have many incentive programs to encourage growth in pastureland related operations. These incentives include conservation districts and easements. These policies help restrict non-agricultural development while at the same time provide tax benefits to landowners. Additionally, Shenandoah County does not charge a tax on farm related machinery, which encourages farmers to invest in their operations. Also, the Ag Extension Program provides farmers with local experts to help them with any issues or questions they have.

Figure 5-3



Source: U.S .Census of Agriculture and RKG Associates, Inc., 2019

Shenandoah County does have many opportunities and options to continue to encourage growth in its pasture related industries. The County should look at restricting the allowable uses of current agricultural land to slow the trend of farmland converting to residential land. Additionally, Shenandoah County could encourage landowners to join its Conservation Easement Program by providing financial incentives to make up for the market value loss of joining the program. Also, Shenandoah should encourage Value-Added processing production facilities to locate within the county. These production facilities would allow for additional jobs and investment to occur within the County. Lastly, Shenandoah County should expand its agricultural entrepreneurship programming to further assist young farmers starting their farming careers.

4. Cropland Use

While cropland has grown in land use over this decade, it has seen a 15.7% drop in total farms over the study period. As previously mentioned, this decline in total farms reflects the growing trend of estate developments leasing portions of their newly acquired land to existing farmers. This has created a consolidation environment where Shenandoah has less crop farmers operating a larger total amount of acres. These leased plots are typically smaller in land size, making them more suitable for crop production.

As shown in Figure 5-3, Corn (for both grain and silage) saw its total acreage harvested increase from 9,452 in 2002 to 13,166 in 2017. This is part of a national trend of corn being used for biofuel uses due to new federal regulations. Because of these regulations, 44.8% of all corn produced is now used in biofuel production. Also, wheat saw its acreage increased substantially in this period, while total wheat amount of wheat operators dropped from 26 to 21. This increase in wheat acreage is almost exclusively due to increased interest in using wheat as a feed in turkey feed.

Conversely, barley experienced significant declines in total acreage used between 2002 and 2017. Even with these declines in barley acres used, Shenandoah County still ranks as the second largest

producer of barley in the state. With the rise of breweries and distilleries within the County, this could become a potential opportunity to increase barley production.

5. Agricultural Sales Trends

Agricultural sales data helps explain what products are growing in production and value compared to others. The total agricultural sales for both the state and the county increased over the past 15 years by 68% and 105%, respectively. This increase for both the state and county is attributed to growth in crop and animal sales. Shenandoah County in 2017 accounted for \$142 million in agricultural sales, which made up 4% of all Virginia agricultural sales. Within the County, livestock and poultry attribute to 86% of all sales.

6. Crop Sales

While cropland farms have decreased, many crops have seen their production levels increase in during the study period. Within the County, total crop sales have increased by 215.2% or \$13.8 million over the past 15 years. With crop sales now totaling \$20 million per year, this significant growth has come from Corn, Fruit & Nuts, and Field Crops. These three categories make up 78% of all sales within the county.

As mentioned above, Corn production nationally has grown due to many factors, including federal regulations that encouraged corn production for ethanol usages. Nationally, after five years of declining revenues due to falling prices, corn has experienced increased revenues as corn prices have stabilized. Within the County, Corn sales have increased by 34% over the study period.

Over the past ten years, Fruits and Nuts sales in Shenandoah County have ranked in the top five within the state of Virginia. Sales data for fruits and nuts products show that a 22% increase over the study period, totaling \$4.4 million in sales in 2017. These numbers were supported by the Andros Foods NA expansion within the County, which sources Virginia grown products.

Field and Grass crops which in Shenandoah County is mainly hay, experienced an increase of 21.9% in sales over the study period. In 2017, Shenandoah County's hay sales were \$4.4 million making it the sixth-largest producing county in Virginia.

7. Poultry Sales

Both the State and Shenandoah County animals' sales, increased within the study period increasing by 94% and 58%, respectively. As Shenandoah County is heavily invested in poultry, 81.3% of all animal sales are poultry-related. Poultry farming has continued to grow within the County, increasing net revenues by 94% within the study period. As mentioned previously, this growth follows the national trend of more consumption of poultry over the past 15 years. Unsurprisingly, some of the largest employers in the County is a poultry company.

8. Cattle Sales

Though Cattle sales make up a smaller portion of overall animal sales, they experienced a dramatic 117% increase. Cattle farmers did this while at the same time seeing their total amount of cattle farms decrease by 23%. This shift can be explained by the rise of large 200+ head farms within the county. These bigger farms have increased by 59%, while smaller farms (less than 200 head) have declined by 27%.

E. OPERATIONAL TRENDS

Understanding the operational trends that farmers are experiencing within a market give insight into the current conditions within that industry. These operational conditions direct effect the profitability of farms.

1. Labor

Since 2002, Shenandoah County has seen a decrease in total farms, but experienced a 5.3% increase in the amount of hired workers on farms. This bucks the state trend, which has seen a 17.4% decrease in hired workers. Additionally, labor costs in the past 15 years have increased by 160.9% within the county. These labor costs are significantly higher than the state averages, which could reflect potential shortages of qualified labor in the County. Also, during the study period, the average age of farmers within the County increased from 57.2 to 60 years old. In 2017, Shenandoah had 547 farmers over the age of 65. The increased hiring and labor costs coupled with the aging farming population, reflects older farmers paying outside labor to manage portions of their farms.

2. Machinery

During this same period, farmers invested in their operations by increasing the value of their machinery inventory by 184% or adding \$62.5 million. It should be noted, that agricultural machinery is not taxed in Shenandoah County. This encourages farmers to invest in their farms and provides them the ability to see a faster return on their investments, compared to their peers in other areas.

3. AgriTourism

Also, Shenandoah County began to diversify its agricultural industry by investing in sectors like agriculture tourism. Between 2002 and 2017, the County added 10 “ag tourism” operations according to the Census. This number does not reflect all the growth within this industry, as many farms have continued their farming operations while adding tourism components to their farms. Additionally, between these years cash receipts for Agritourism operations increased from \$9,000 to \$1,009,000. Currently, the County boasts 5 breweries, 9 vineyards and 1 distillery that people from all over the region frequently travel too. Additionally, tourists can now enjoy the “Shenandoah Spirits Trail”. This tour showcases the venues listed above along with the other vineyards, breweries, cideries and distilleries within the entire Northern Shenandoah Valley.

F. SWOT ANALYSIS

1. Strength

Shenandoah County has many strengths that benefit the agriculture industry.

- Community Support – The County has always had a commitment to the agricultural community. This tradition of agricultural success has created a desire to maintain the agricultural industry as a key part of the county’s economic future. Additionally, because of this long-standing commitment to the farming industry, pro-agriculture policies and programs have been championed by the County’s leadership.
- Existing Pro-Agriculture Policies– As discussed in a previous section, another strength is the already existing pro-agriculture policies that have been established. Programs like the ag/forestall district and conservation easement program protect open lands and protect key

natural resources. The conservation easement program gives landowners can reap significant income tax and estate tax benefits by donating an easement.

- No Taxes on Machinery– As stated above, another pro-growth policy within the County is the zero-tax rate on farm machinery. This policy encourages the expansion of farm operations while making it more financially feasible to operate a farm in this county.
- Relationship with School Districts– Additionally, the County has worked with the school districts to have agricultural-related education programs. These programs allow for much-needed workforce training opportunities. Furthermore, the agricultural community has established a local agricultural purchasing program for school lunches and events. This program is advantageous to farmers as the school districts provide them with a buyer that is large, established, and local.
- Agriculture Extension Program – As cited previously, Shenandoah County farmers are part of the State of Virginia’s Agriculture Extension Program. This program provides farmers with local experts in many different parts of the agricultural industry. Individuals involved in this program have mentioned that the program is filled with passionate and proactive members.

2. Weaknesses

The County does have weaknesses it can work to improve on to provide a more business-friendly environment.

- Messaging – One weakness is the disjointed messaging from the agriculture community in terms of future land use. Segments of the agricultural community do not want to see the continued trend of farmland being purchased and changed into residential development. While farmers are upset about this trend, other farmers demand that property rights and zoning do not change so they can maintain their ability to sell their land to any buyer upon retirement. This trend creates a divide between farmers which makes it hard to both build consensus and plan for the future.
- Lack of Direction – Another flaw is the unclear direction and messaging from the Shenandoah County government to the agricultural community. The County has often developed strategies that are reactive instead of proactive to the needs of the agricultural industry. This unclear strategy allows for rumors and fear to spread throughout the County. The SEDP provides some structure and long-term planning recommendations to the economic development vision for the County.
- Lack of Staffing – The agriculture community has expressed their frustration with the lack of staffing in support agencies that work directly with their industry. Not staffing enough people in both economic development and Agriculture Extension roles has slowed down potential progress and development within the County.

3. Opportunities

Shenandoah County has many potential opportunities to expand its agriculture industry.

- Redefining Allowable Uses on Agricultural Land – As mentioned before, one potential opportunity is to change the allowable uses on agricultural land. On one hand, allowing ag-based manufacturing (i.e. greenhouses) could increase yield (and value) on agriculturally zoned land with compatible uses. On the other hand, removing residential uses (or expanding the minimum acres per unit) would reduce the pressure to convert for residential use and reduce the erosion

- of agricultural land for estate development. It should be noted that this restricting acceptable uses on farm land could adversely impact immediate land value within the County.
- Value-Add Facilities – As discussed previously, the County should explore and diversify its value-add production facility offerings to expand its economic base. These facilities could include livestock (beef, goat, sheep swine) processing, milk (cheese, yogurt, ice cream, fluid milk), vegetable/fruit processing, commercial kitchens, and timber mills. These value-add facilities would provide investment and jobs into the County.
 - Agritourism – As consumers have continued to put importance on experienced-based retail offering, agritourism has become a significant part of any agricultural community. Shenandoah County should continue to develop this type of tourism through promoting beverage manufacturing, seasonal attractions, and on-site hospitality.
 - Financial Incentives to Conservation Easements – As mentioned above, the County could increase the financial incentives for conservation up to the loss from market value allowing for farmers to maximize the value of their land through preservation. However, it would have financial impacts on the County, in terms of further reduced revenues and direct costs.
 - Business Assistance – As discussed in a previous section, Shenandoah should expand its business assistance offerings to allow to attract new business development within the County. This could include an entrepreneurship development program to help new agriculture entrepreneurs start their own businesses. Programs like these will become increasingly important as the average age of farmers within the County continues to rise.

4. Threats

Any industry or community has threats that it must address to maintain its competitiveness and to plan for the future.

- Current Zoning – One threat that is the agriculture community of Shenandoah County has to face is the current zoning allowing estate development in agricultural areas. As retired farmers are receiving superior offers from estate developers than neighboring farmers, this has caused farmland acreage to decrease.
- Taxation – The Census data indicate that the farming community within Shenandoah County has made substantial staffing and capital investments over the past 15 years to remain competitive and increase the viability of these respective farms. Any abrupt changes in how the County taxes these businesses could have an unintended, but substantial, impact to the agriculture industry.
- Tax Base – As the County has not been proactive in its efforts to increase its tax base, it could find itself unable to provide the same level of services needed to stay competitive.
- Inputs and Regulations – The agriculture industry is highly dependent on many inputs to maintain profitability and competitiveness. These inputs include the price of oil, feed, and other key inputs. Also, additional state or federal regulations and tariffs could dramatically affect Shenandoah farmers.