

New River/Mount Rogers Skills Gap Analysis

PART D: AGRICULTURE

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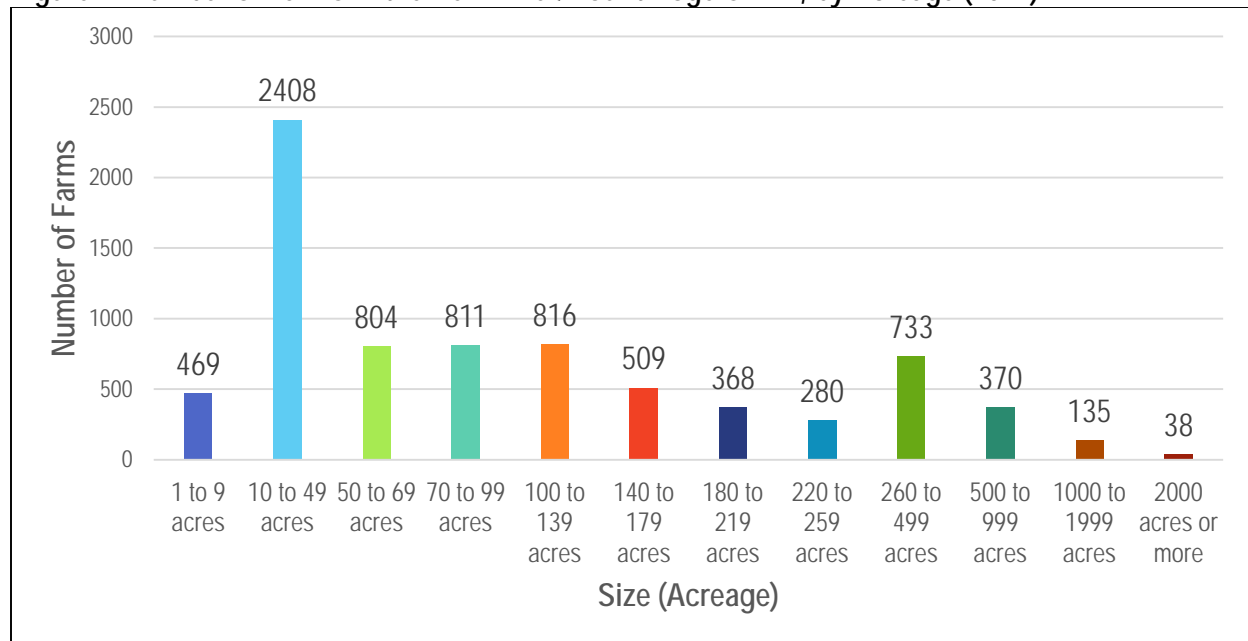
Agriculture

Section 1: Regional Agricultural Industry Dynamics

Number and Size of Farmsⁱ

As of 2012, the New River/Mount Rogers WIA has a total of 7,741 farms covering almost 1.3 million acres of land. In total, 16.8% of Virginia's farms and 15.6% of Virginia's farm acreage are represented throughout the region. When compared to 2007 data, the region has experienced a growth in farm acreage by adding 111,164 acres; however, the region did see the number of farms decline by 248.

Figure 1: Number of Farms in the New River/Mount Rogers WIA, by Acreage (2012)



Overall, Washington County is the region's leading jurisdiction in terms of number of farms and well as total land acreage in farms. Overall, 2 out of 10 (1,602) regional farms are located in Washington County. Carroll County (980 farms), Wythe County (952 farms), and Floyd County (863 farms) are also leading localities for farm presence. Since 2007, Giles County has reported the highest growth for number of farms (+34 farms) while Washington County reported the most decrease in number of farms (-189 farms).

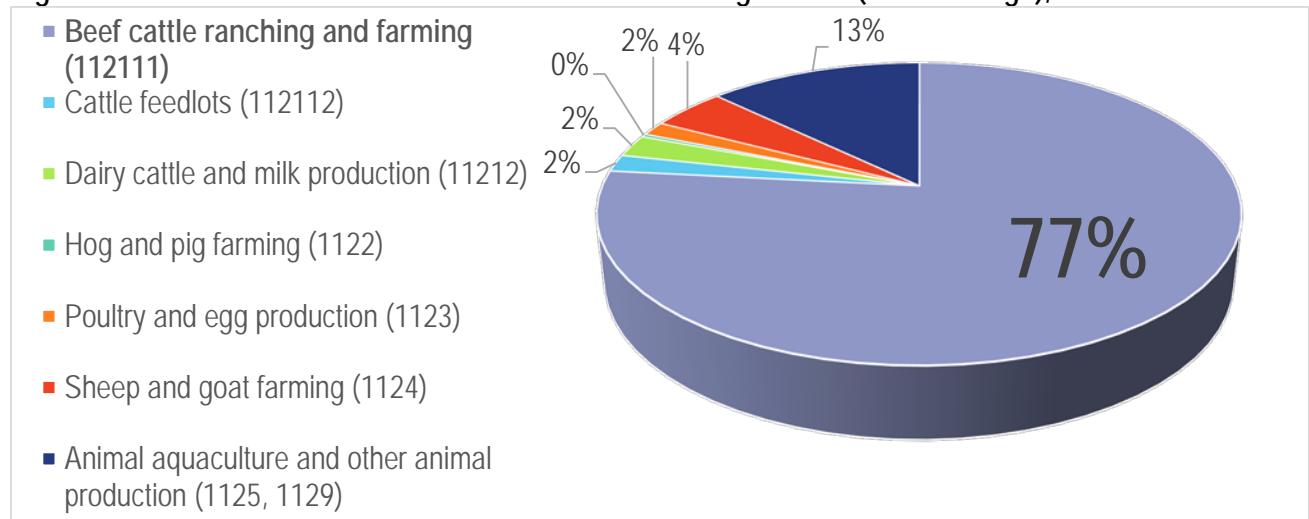
While some counties report greater numbers of farms, some jurisdictions have more acreage attributable to farms. Behind Washington County (198,850 acres), Wythe County (159,126 acres), Grayson County (136,752 acres), Floyd County (128,872), and Smyth County (127,307 acres) are leaders for farm acreage. Smyth County experienced the highest growth for farm acreage (+39,349 acres) while Washington County reported the most decline (-6,727 acres).

Overview of Regional Agricultural Products, by # of Farmsⁱⁱ

Review of industry codes for regional farms shows that over half of all farms are utilized for the production of beef cattle ranching and farming (NAICS 112111) (4,199 farms or 54.2%). Other Crop Farming (NAICS 1119), most likely hay farming, represents the second largest form of agricultural product produced across

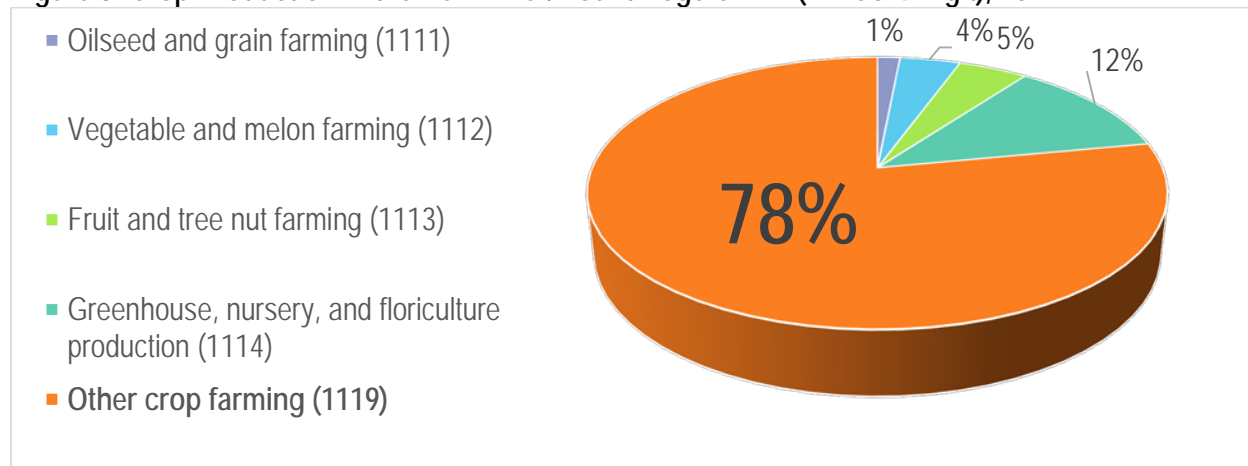
the region (1,766 farms or 22.8%). Greenhouse, nursery, and floriculture production (268 farms) and Sheep and goat farming (246 farms) are also amongst the region’s leading types of agricultural products.

Figure 2: Livestock Production in the New River/Mount Rogers WIA (NAICS 6-Digit), 2012ⁱⁱⁱ



By jurisdiction, Washington County leads for number of Beef cattle ranching and farming operations (827 farms), followed next by Wythe County (562 farms) and Carroll County (563 farms). For crop production, Grayson County (95 farms) and Floyd County (53 farms) are top for Greenhouse, nursery, and floriculture production. Carroll County is the leader in Fruit and tree nut farming (26 farms) and ranks second in terms of Vegetable and melon farming (24 farms). For Other crop farming, Washington County is the regional leader with over 454 farms.

Figure 3: Crop Production in the New River/Mount Rogers WIA (NAICS 4-Digit), 2012^{iv}



Section 2: Regional Agricultural Employment

Principal Farm Operators^v

In efforts to assess the various types of regional farm employment, OED first began by examining demographics and characteristics for principal farm operators. According to the U.S. Census/U.S. Department of Agriculture, principal operators are those persons who 'operate a farm either doing the working or making the day-to-day decisions about such things as planting, harvesting, feeding, and marketing.' Operators may be the farm owner, member of the owner's household, a hired manager, a tenant, a renter, or a sharecropper. Operators are a target occupation for this workforce analysis given their diversity of responsibilities for management and production oversight.

Across the region, principal farm operators are predominately male (88.2%). Eight out ten principal operators live on the farm they operate, yet most (57.4%) have a primary occupation other than farming. These findings are important to regional workforce considerations as non-farming principal operators have knowledge and skills sets acquired through farming experience which are exhibited through employment in other occupations or industries. Regionally, 45.9% of principal operators work at least 200 days or more off of the farm, as compared to 34.7% who work strictly on the farm.

Figure 4: Characteristics of Principal Farm Operators in the New River/Mount Rogers WIA, 2012^{vi}

	Principal Operator Characteristics		Primary Occupation		Place of Residence	
	<i>Male</i>	<i>Female</i>	<i>Farming</i>	<i>Other</i>	<i>On Farm Operated</i>	<i>Not On Farm Operated</i>
Bland	324	38	162	200	289	73
Carroll	857	123	384	596	825	155
Floyd	747	116	416	447	697	166
Giles	328	50	152	226	310	68
Grayson	696	68	338	426	602	162
Montgomery	515	88	239	364	487	116
Pulaski	372	73	188	257	351	94
Smyth	715	77	326	466	601	191
Washington	1423	179	636	966	1193	409
Wythe	853	99	455	497	780	172
Total (#)	6,830	911	3,296	4,445	6,135	1,606
Total (%)	88.2%	11.8%	42.6%	57.4%	79.3%	20.7%

Farming is an aged type of work; regionally, 6 out of 10 principal farm operators are at least age 55 (64.3%). Moreover, a total of 21.8% are age 70 and above. Only 5.1% of principal operators are under the age of 35. Average age of principal operators throughout the region range between 57 to 60 years. Giles County has a slightly lower average age at 57.5 years while Bland County reports the region's highest average at 60.2 years.

The aging of principal farm operators has implication for other major regional industries. Particularly, as the region begins to lose a population of individuals with cross-skill transferability from farm operation the region may be posed to experience a gap for workers with applied experience and aptitudes for mechanical

and repair knowledge. When reviewing aging trends from 2007-2012, some regional jurisdictions did experience slight increases in the number of principal operators age 35 and below. For example, Wythe County added 20 younger principal operators, followed by Giles County with 18. Smyth, Carroll, and Bland each added 12-13 principal operators under age 35. Coincidentally, as some localities saw increases in the number of younger operators, Grayson (-14), Floyd (-12), and Pulaski (-7) counties reported slight declines. Washington and Montgomery counties remained relatively unchanged, only seeing slight declines of 3-4 younger operators.

Figure 5: Number of Days Worked Off-Farm, Principal Operators in the New River/Mount Rogers WIA (2012)^{vii}

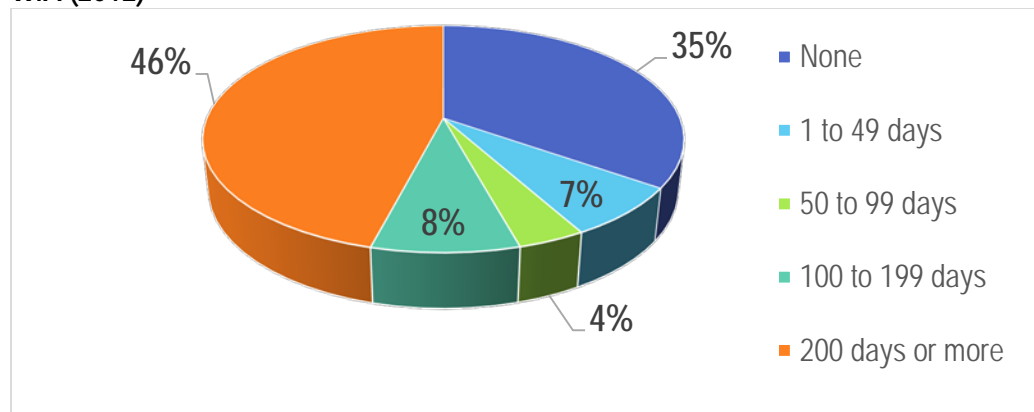
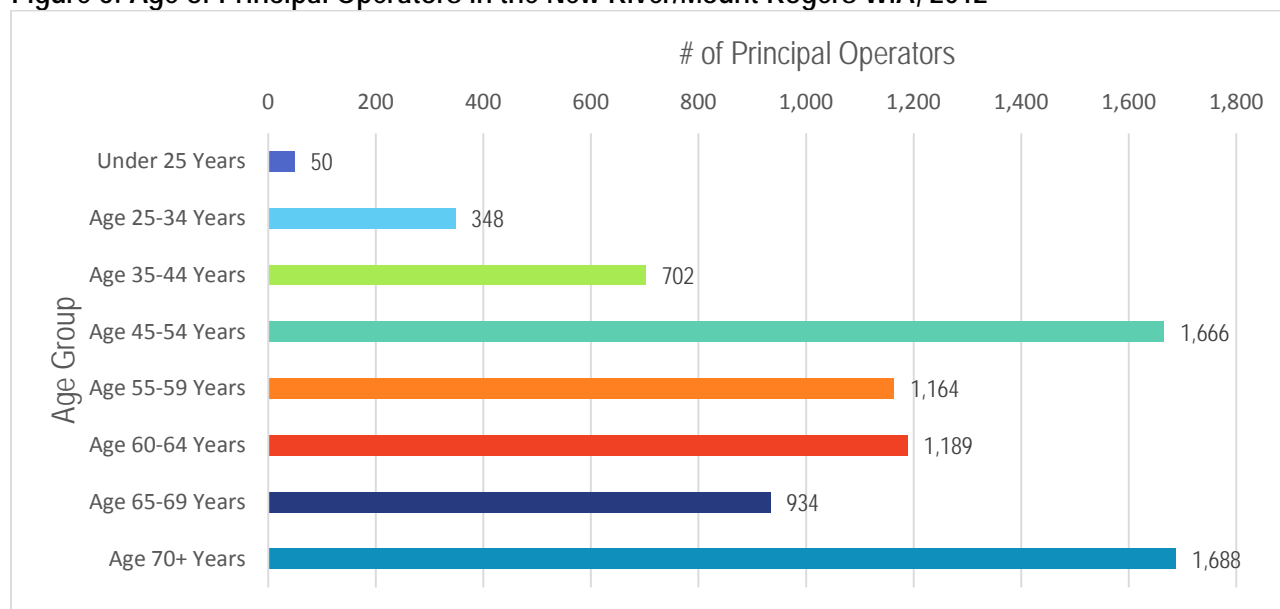


Figure 6: Age of Principal Operators in the New River/Mount Rogers WIA, 2012^{viii}



Hired Labor^{ix}

Across the region, a total of 1,813 (23.4%) of regional farms have hired farm laborers, or paid family members. As of 2012, hired farm labor represents an estimated 5,252 individuals. Washington County reports the region’s leading jurisdiction for employment, accounting for 1,056 workers. Floyd County (771 workers), Wythe County (610 workers), and Floyd County (609 workers) are also leading localities for hired laborers.

For those regional farms which employ hired labor, 87.1% (1,580 farms) have less than 4 employees. Coincidentally, 42.5% of farms only employ 1 hired laborer.

Hired labor employment is mostly seasonal. 3,796 laborers (72.3%) work less than 150 days annually as compared to 1,456 (27.7%) who work more than 150 days. The proportion of shorter-term to longer-term hired labor varies across counties and is likely influenced by farm sizes and types of products produced. For example, over 80% of hired laborers in Carroll and Giles counties work less than 150 days/year.

Section 3: Understanding Knowledge and Skills Sets Most Common to the Regional Agricultural Economy

Using data provided through the U.S. Department of Labor's O*NET database, OED first wanted to identify which forms of knowledge and skills competencies are most important to principal farm operators and hired farm labor. To do this, OED collected data for top regional agricultural job titles (by SOC code) which are believed to most closely reflect the job tasks and duties for farm operators and hired labor. See Agriculture: Appendix for a summary of top summary of the top data findings.

Next, OED wanted to further explore how agricultural knowledge and skills sets are transferable to employment in other regional industry sectors. Figures 7-12 shown below provide a summary of key findings, noting potential knowledge and skills "gaps" as appropriate. As data collection and analysis for the region's Manufacturing industry suggests potential connectivity, OED researchers wanted to specifically examine how top regional agricultural jobs share similarity to certain forms of production occupations and maintenance occupations characteristic of Manufacturing employment.

SOC-O*NET Job Titles Most Similar to Principal Farm Operators

Figure 7: First-Cousin Production and Maintenance Jobs for Supervisors of Animal Husbandry and Animal Care Workers (Science, Technology, Engineering, and Math Competencies shaded 'Red')

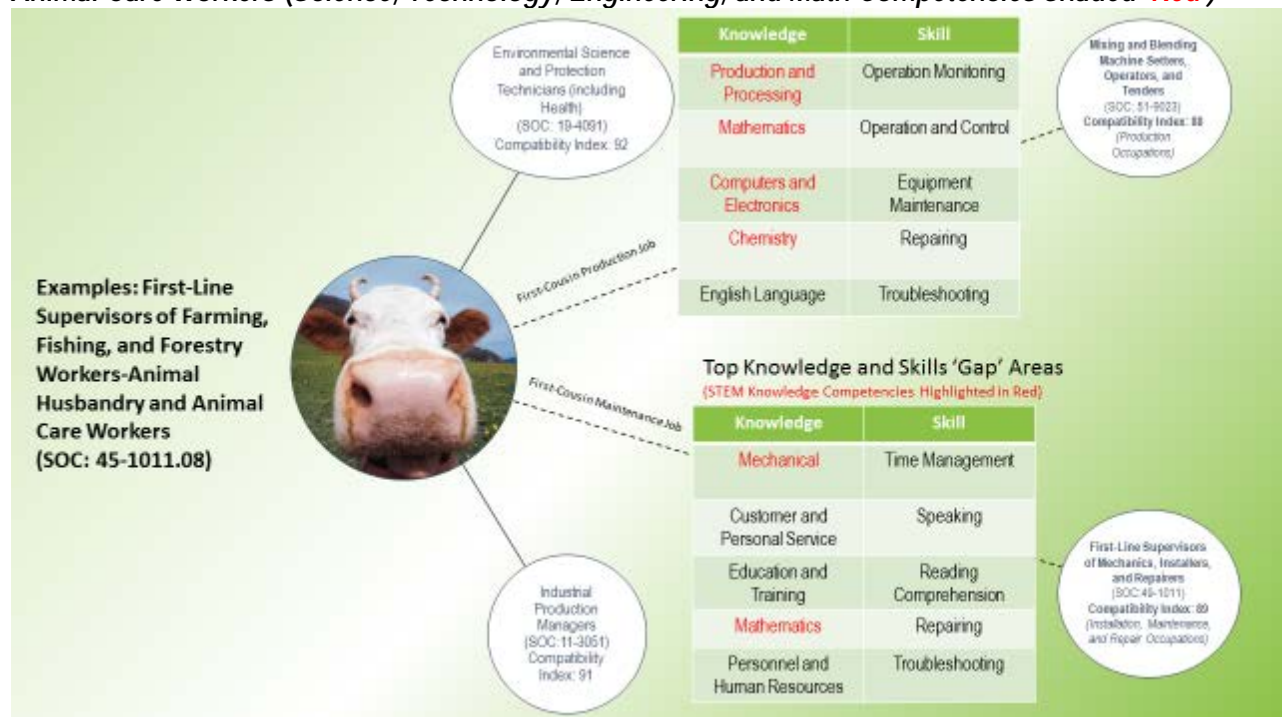


Figure 8: First-Cousin Production and Maintenance Jobs for Supervisors of Crop and Horticultural Workers (Science, Technology, Engineering, and Math Competencies shaded 'Red')

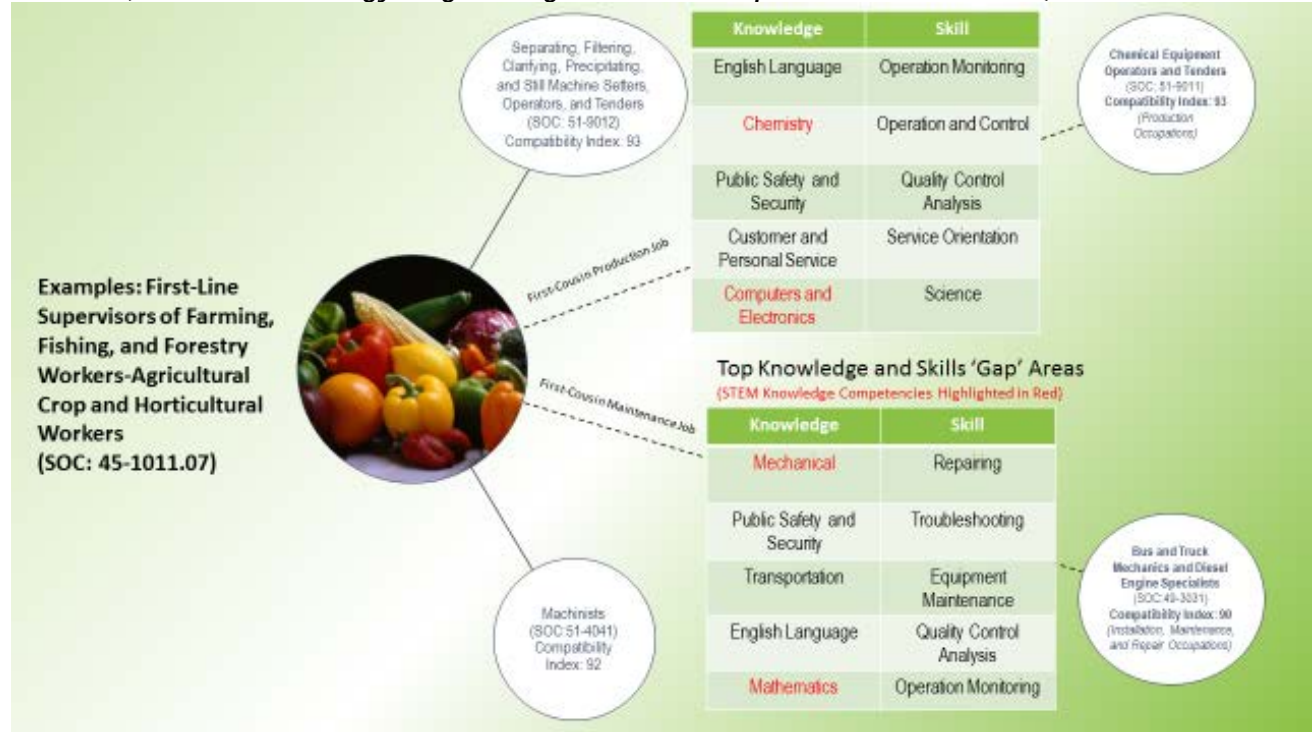
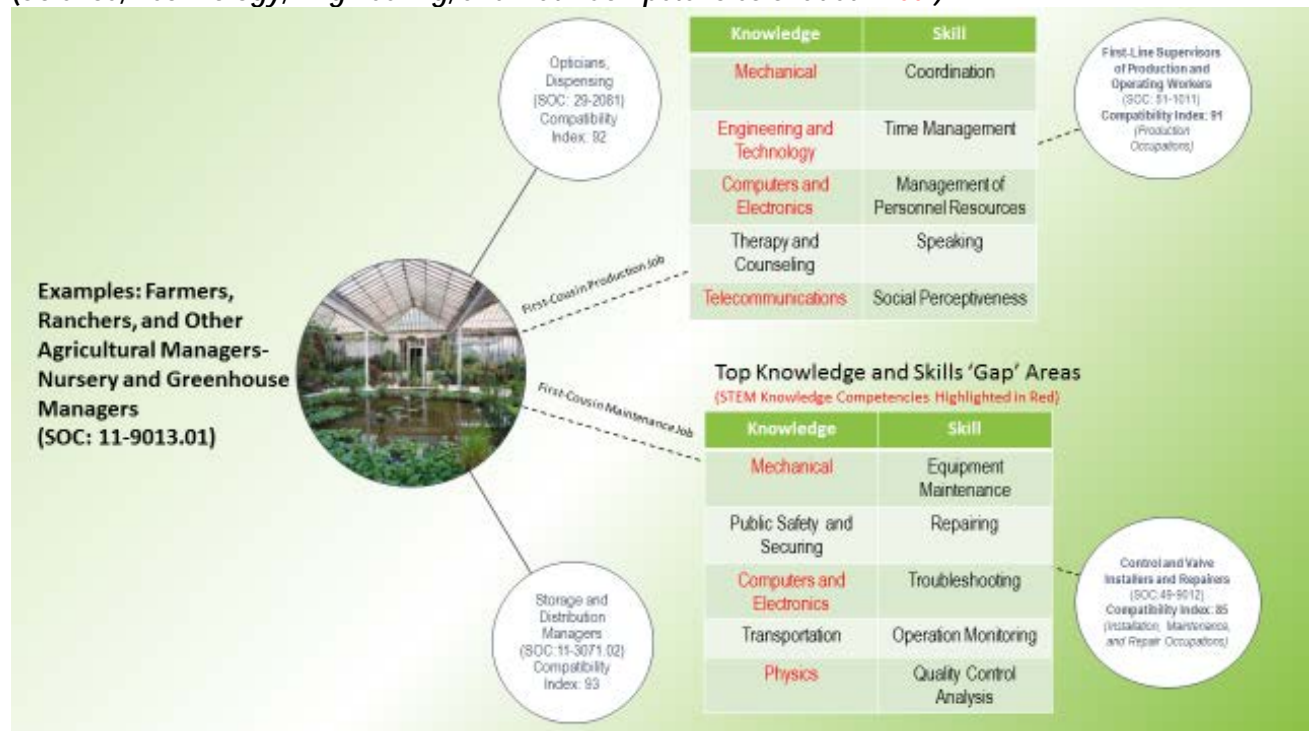


Figure 9: First-Cousin Production and Maintenance Jobs for Nursery and Greenhouse Managers (Science, Technology, Engineering, and Math Competencies shaded 'Red')



SOC-O*NET Job Titles Most Similar to Hired Farm Workers

Figure 10: First-Cousin Production and Maintenance Jobs for Farmworkers, Animals (Science, Technology, Engineering, and Math Competencies shaded 'Red')

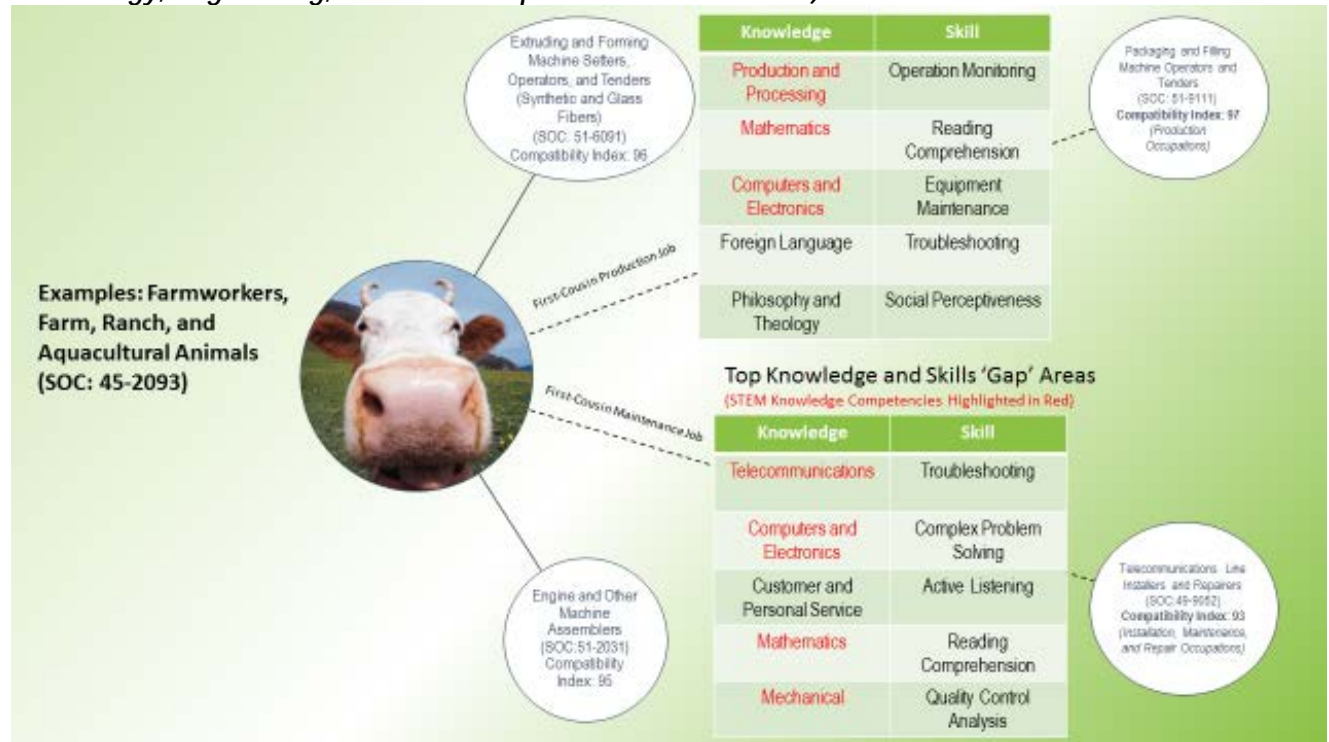
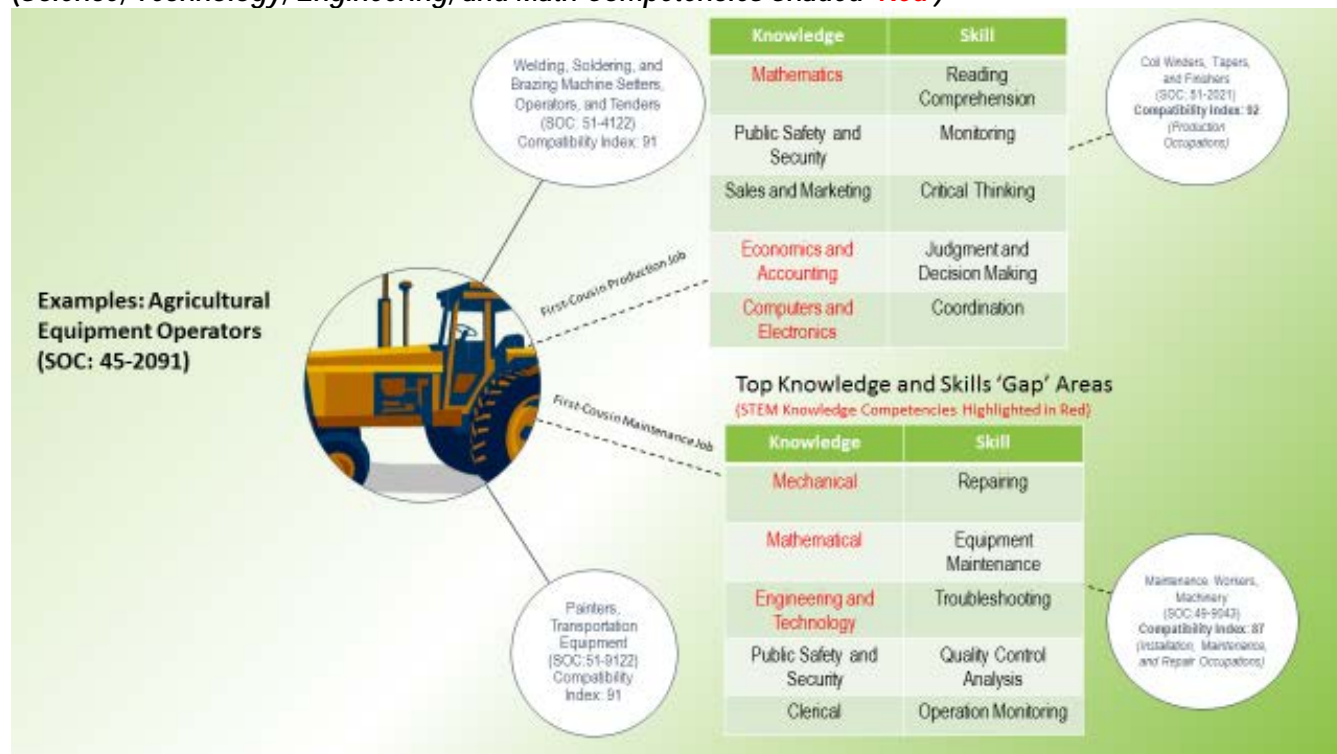


Figure 11: First-Cousin Production and Maintenance Jobs for Farmworkers, Crop (Science, Technology, Engineering, and Math Competencies shaded 'Red')



Figure 12: First-Cousin Production and Maintenance Jobs for Agricultural Equipment Operators (Science, Technology, Engineering, and Math Competencies shaded 'Red')



Section 4: Key Findings and Best Practices-- Agriculture

The following provide a summary of the key findings for Agricultural workforce skills in the New River/Mount Rogers region:

- The majority of the region’s farms are small acreage; 58% being less than 100 acres. During OED’s employer outreach efforts, it was discovered that small acreage farming operations often required the operators and/or hired laborers to have very diverse skills sets.
 - Specific types of aptitudes or skills mentioned included: understanding for hydraulics and pneumatics necessary to repair equipment; basic motor or engine repair; carpentry and electrical to construct or repair structures; ability to perform basic welding to repair equipment; knowledge of soil and crop conditions; knowledge of animal health and breeding.
- Most agricultural workers do not consider farming to be their primary occupation and/or work in farming less than 150 days each year. As such, many are employed in, or operate other forms of regional businesses. Employer outreach suggests that agricultural workers most likely work in, or own manufacturing operations, repair shops, and lawn and gardening service providers.
- Since many agricultural workers are often employed in other jobs/industries, understanding how farm skills are transferable to other types of work may reveal how the presence of agriculture influences the overall aptitude and availability of a skilled workforce, particularly for production and installation, maintenance, and repair jobs. Skill transferability to other industries is often accelerated in instances where prior agricultural work experience can be demonstrated.
- In addition to technical or mechanical skills noted above, many farmers who are operators also have at least a basic understanding for business administration and finance management. These

skills sets are especially valuable when an agricultural worker also owns or manages another form of business venture.

- The New River/Mount Rogers region has a strong educational pathway for agricultural education. This is an important asset as 6 out of 10 principal farm operators are at least age 55. As home to Virginia's largest land grant university, Virginia Tech is an international leader for agricultural education and research and development activities. Extending to earlier stages of the career pathway, the region also can demonstrate several best practice models for agricultural education at the K-12 level. Examples of promising K-12 programs in the WIA include:
 - Agricultural education in Carroll County: Coincidentally, Carroll County was the first school system in the nation to teach Agriculture in high school courses through the Smith-Hughes Act of 1917. Continuing a precedent for pioneering agricultural education, Carroll County recently became one of the first high schools in the nation to create a STEM (Science, Technology, Engineering, and Mathematics) lab specifically focusing on Agriculture. Financed through USDA Rural Development, this lab emphasizes instruction in scientific protocols to assist local agricultural producers in compliance to increasingly high standards for food safety. Carroll County is also one of the few public school systems to maintain working school farms which provide students hands-on field experience. Another unique facet of Agriculture education in Carroll County includes increasing efforts to tie educational resources to interest with the Southwest Virginia Farmers' Market.
 - 4-H Programs: Throughout the fact-finding activities to support this report, employers stressed the importance of 'soft skills' for overall employability. When examining education and training programs, 4-H emerged as a valuable resource for agricultural career awareness and applied learning, as well as for helping to provide instruction in various 'life skills.' For more information about 4-H, please visit the Virginia Cooperative Extension homepage at: <http://www.4-h.ext.vt.edu/programs/index.html>

End Part D: Agriculture

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References

ⁱ Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Table 8: Farms, Land in Farms, Value of Land and Buildings, and Land Use: 2012 and 2007.

ⁱⁱ Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Table 44: Farms by North American Industry Classification System: 2012.

ⁱⁱⁱ Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Table 44: Farms by North American Industry Classification System: 2012.

^{iv} Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Table 44: Farms by North American Industry Classification System: 2012.

^v Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Table 45. Selected Operation and Operator Characteristics. 2012.

^{vi} Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Table 45. Selected Operation and Operator Characteristics. 2012.

^{vii} Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Quick Stats.

^{viii} Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Quick Stats.

^{ix} Source: United States Department of Agriculture. 2012. Census of Agriculture. 2012 Census Volume 1, Chapter 2: County Level Data. Table 7. Hired Farm Labor- Workers and Payroll: 2012.