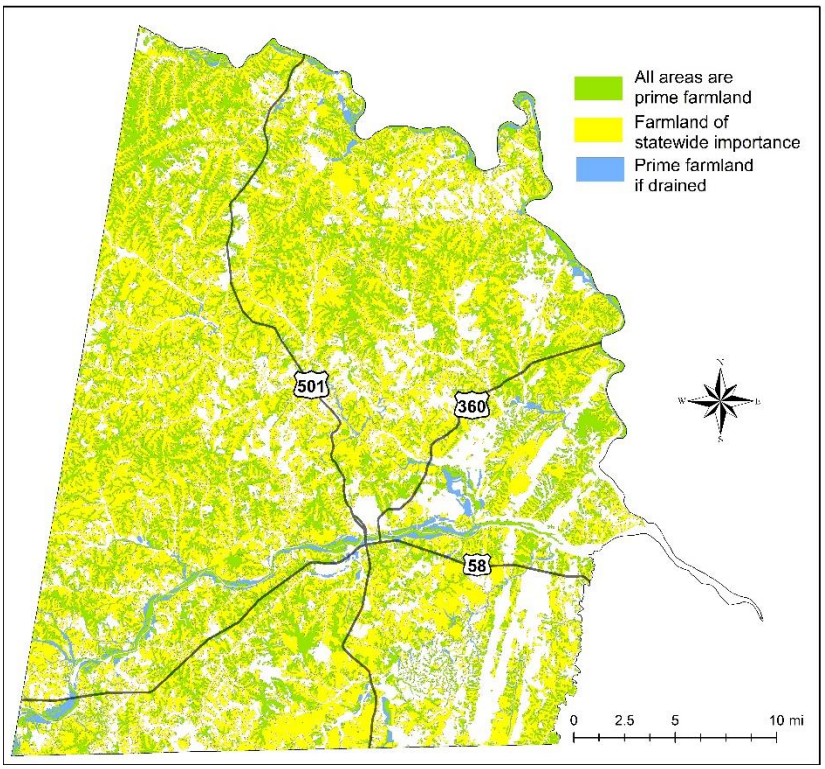
Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.

If conditions are favorable and drained, some land can be considered important or have the potential to be prime although not considered prime.

Halifax County has approximately six times more farmland with suitable soil than the state of Virginia.

Farmland	County Acres	Percentage	State Acres	Percentage	Country
Prime	126,074	23.7%	1,267,309	4.97%	0.1%[1]
Of Statewide Importance	239,363	45.1%	1,484,407	5.8%	*N/A*
Prime if Drained	9,773	1.8%	304,492	1.2%	*N/A*
Total		**≈70%**		**≈12%**	



[1] http://www.farmlandinfo.org/statistics

The total acres were determined by joining the soil conditions needed for each crop to the various soil plots within Halifax County. Percentages were then calculated to show prevalence for total land area. Yields were calculated by multiplying potential yield estimated by USDA (converted to tons) by total acres estimated from soil plots. Yields per acre were estimated for crops based on USDA estimations. The following are estimated factors for each: Corn typically yields 3.7 tons per acre, wheat at 1.4, barley at 1.5, oats at 1 ton per acre, tobacco at 1.1, soybeans at 0.9 tons, tomatoes at 11.8 tons per acre, cabbage at two, pumpkin at 9.6, apples at 9.5, cantaloupe at 4.6, watermelon at two, strawberries at four, wine grapes at four tons, hops at approximately 0.9 tons, hemp at three tons, turmeric at nine, ginger at 18, and herbs vary significantly.

Soil suitability was based on basic supporting soil properties for each crop not specified by USDA:

Crop	**Soil Type**
Apples	Well Drained, pH 5.8-7, moderate frost heave
Cabbage	Rich and moist but well drained, with a pH of 5.5-6.5
Cantaloupe	Fumigated soil helps with weed control and disease, pH target of 6.0-6.5
Ginger (and other herbs)	pH target of 6.0
Hemp	Well drained, pH target of 6.0
Hops	Well Drained, pH target of 6.0
Pumpkins	pH target of 6.5, with lime below 6.0
Strawberries	Deep, fertile soil with high organic matter content and a pH between 5.5-6.8
Tomatoes	Sandy loam soils, pH target of 6.5 with lime below 6.0
Turmeric	Moderate or poor drainage, pH 5-6.5, hydric, no frost heave
Watermelon	Fumigated soil helps with weed control and disease, pH target of 6.0-6.8
Wine Grapes	Hydro. groups C/D, not hydric, well drained, medium/low runoff potential, pH 5-6.5

Bushels were converted to tons using the following conversions[2]:

Wheat	36.74
Oats	64.84
Barley	45.93
Corn	39.37
Soybeans	36.74

CWT or hundredweight was converted to tons using a factor of 17.8571 CWT per ton.

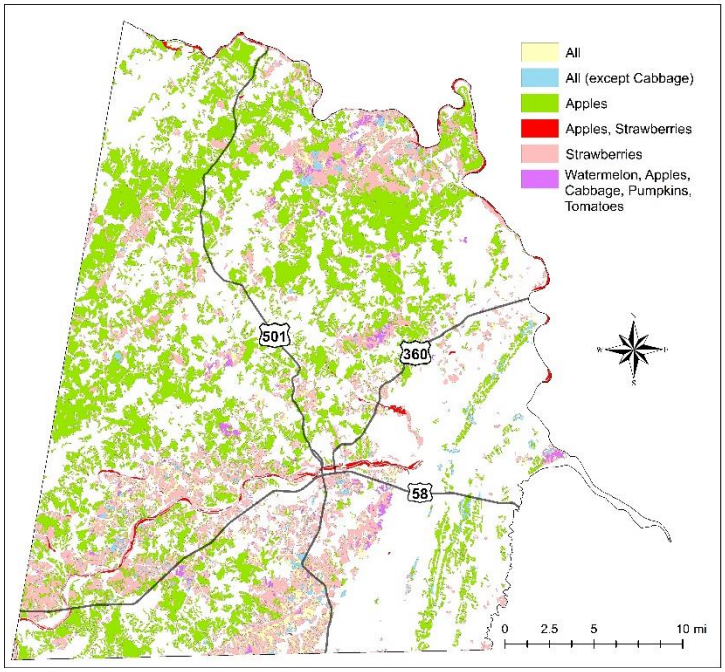
[2] https://www.agric.gov.ab.ca/app19/calc/crop/bushel2tonne.jsp

Prices were calculated by Virginia's 2016 prices per ton for each crop and multiplied by estimated yield to produce the estimated return for each crop.

All suitable land was considered for normalization purposes to show the potential for highest monetary return in Halifax County. A geospatial analysis was conducted to determine acreage for each crop by soil suitability which are listed in the order of highest potential for county.

Produce, Estimated Return based on Soil Suitability, 2016 Yield and Price Estimates

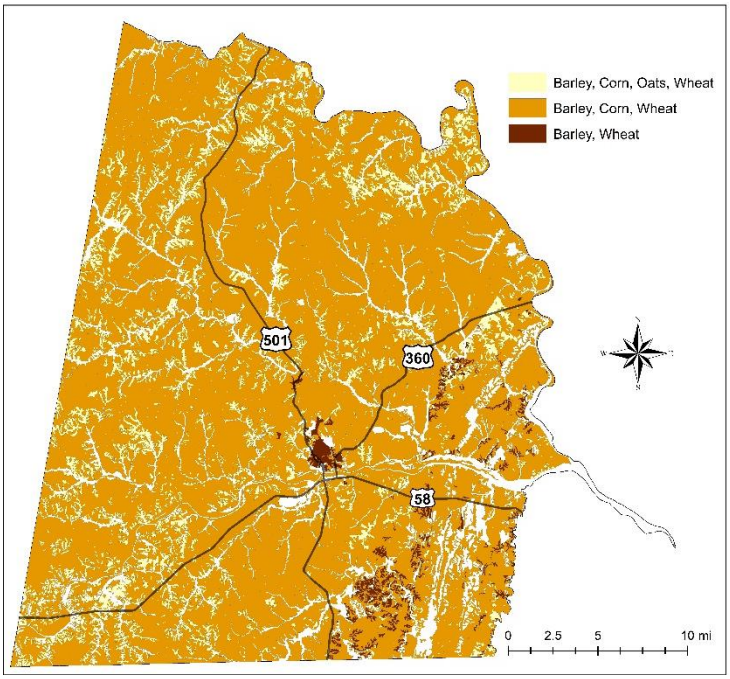
Crop	Acres	Percentage	Yield (tons)[3]	Price (per ton)[3]	Estimated Return (million$)
Apples	150,916	28.4%	1,433,702	510	$731.19
Strawberries	82,272	15.5%	378,451	1,284	$485.93
Cantaloupe	16,526	3.1%	148,734	348	$51.76
Pumpkin	19,662	3.7%	188,755	214	$40.39
Tomatoes	19,662	3.7%	232,012	97	$22.51
Cabbage	15,198	2.9%	30,396	343	$10.43
Watermelon	19,662	3.7%	39,324	246	$9.67



Grains, Estimated Return based on Soil Suitability, 2016 Yield and Price Estimates

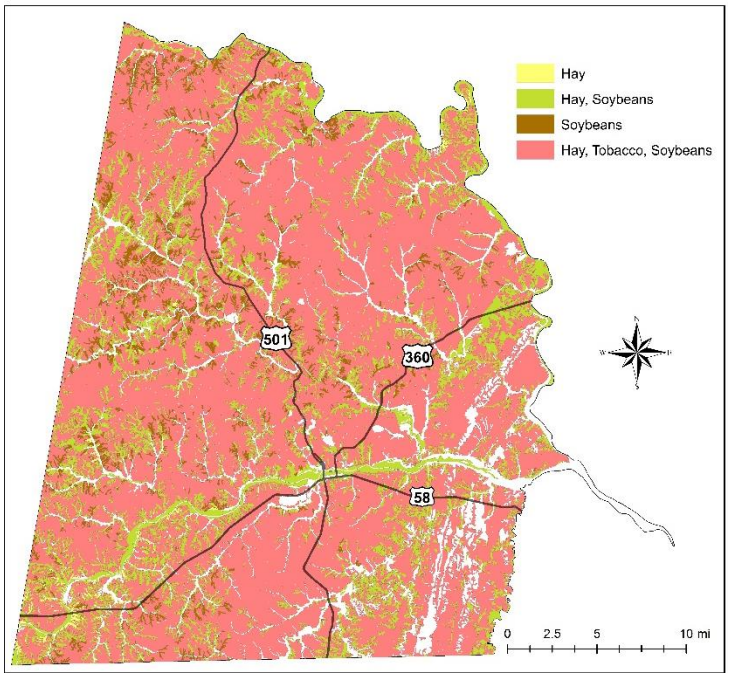
Crop	Acres	Percentage	Yield (tons)[4]	Price (per ton)[4]	Estimated Return (million$)
Corn	470,048	88.5%	1,767,098	$147	$259.76
Wheat	478,119	90%	689,645	$175	$120.69
Barley (bread)	478,119	90%	697,452	$134	$93.45
Oats	49,106	9.25%	51,244	$172	$8.81

[3] http://usda.mannlib.cornell.edu/usda/nass/CropValuSu//2010s/2016/CropValuSu-02-24-2016.pdf
[4] https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=Virginia



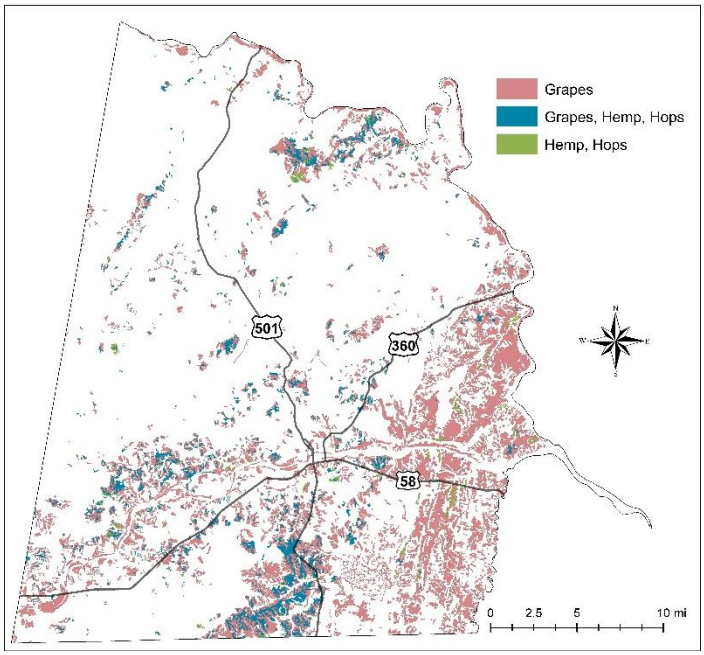
Other Commodity Crops, Estimated Return based on Soil Suitability, 2016 Yield and Price Estimates

Crop	Acres	Percentage	Yield (tons)[4]	Price (per ton)[4]	Estimated Return (million$)
Tobacco	370,938	69.9%	406,734	$4,226	$1,718.86
Soybeans	478,119	90%	468,438	$338	$158.35
Hay	461,193	86.8%	1,079,192	$141	$152.17



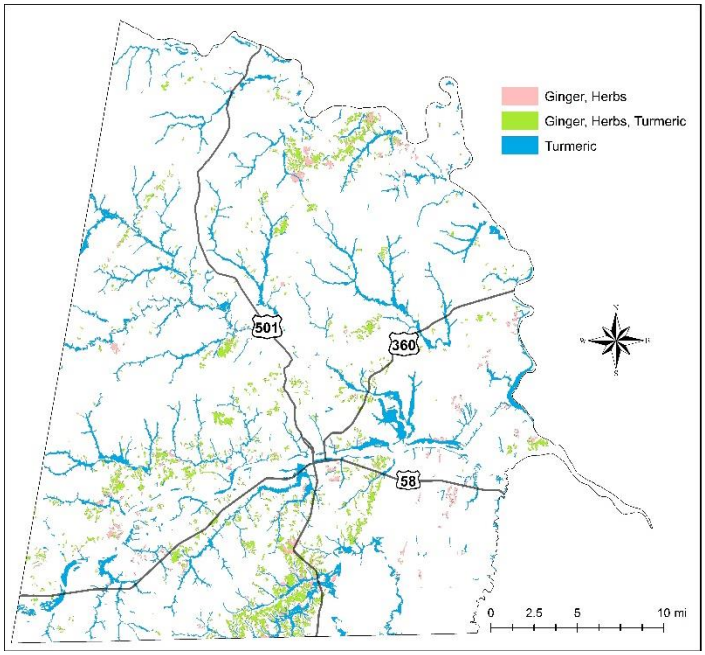
Specialty Crops, Estimated Return based on Soil Suitability, 2016 Yield and Price Estimates

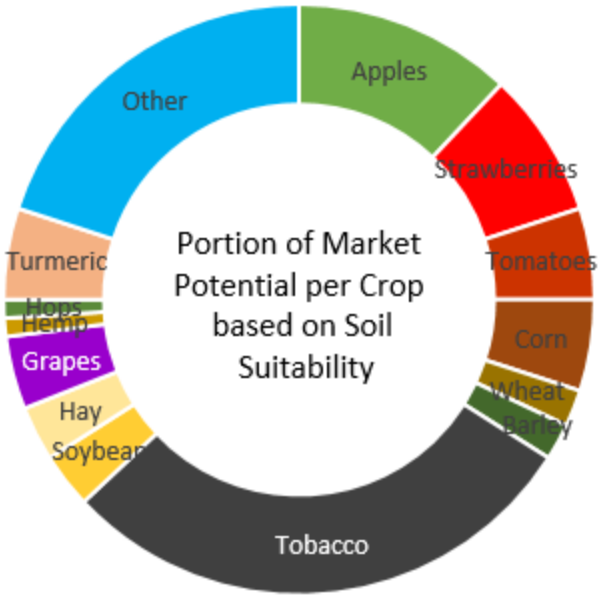
Crop	Acres	Percentage	Yield (tons)[4]	Price (per ton)[4]	Estimated Return (million$)
Wine Grapes	894,28	16.8%	357,712	$620	$221.78
Hemp	16,527	3.1%	49,581	$1,675	$83.05
Hops	16,527	3.1%	14,874	$2,000	$29.75



Small-Scale Crops, Estimated Return based on Soil Suitability, 2016 Yield and Price Estimates

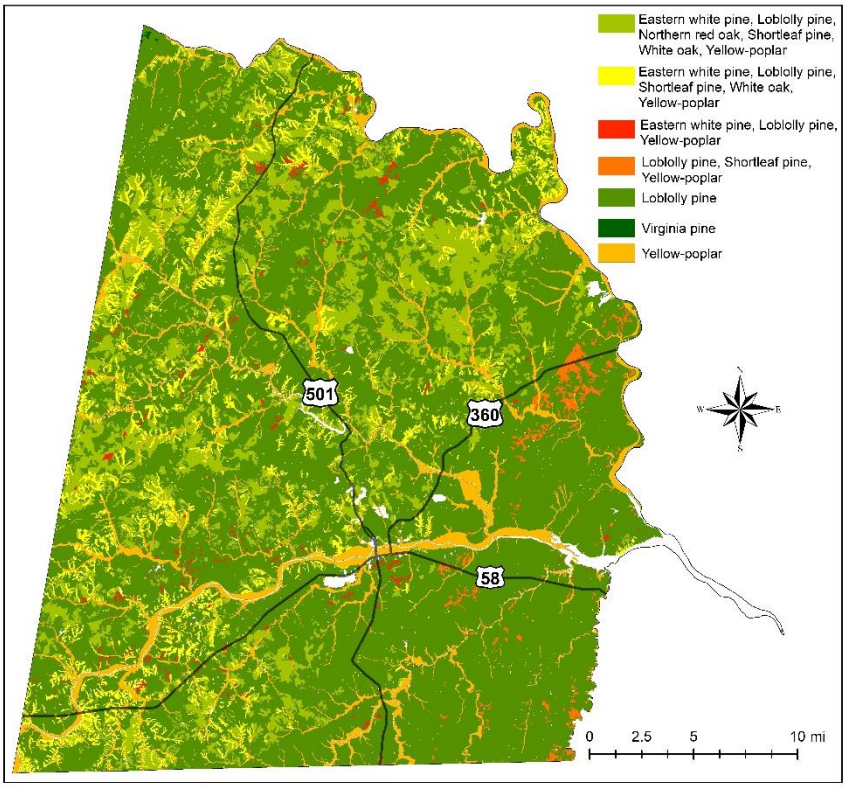
Crop	Acres	Percentage	Yield (tons)	Price (per ton)	Estimated Return (million$)
Ginger	19,662	3.7%	353,916	$3,200	$1,132.53
Turmeric	46,749	8.8%	420,741	$800	$336.59
Herbs	19,662	3.7%	*Varies*	*Varies*	*Varies*





Based on soil suitability, estimated yield, and estimated price per unit, tobacco has the highest potential return. Apples as the top produce, corn as the top grain, wine grapes have the highest potential of any other specialty crop, and ginger has the highest potential of any small-scale crop based on its high yield and high price per unit. Ginger, turmeric, and other herbs will likely be cultivated in greenhouses in smaller quantities. The data suggests that approximately four to nine percent of soil in the county could be used in these greenhouses and nurseries to sustain these smaller niche crops.

Tree Species Suitability Analysis



The most suitable trees with highest economic value for each soil type was obtained by the USDA-NRCS soil survey data by conducting a geospatial analysis. The total acres were estimated by joining the soil types needed for each crop to the various soil layers within Halifax County. Percentages were then calculated to show prevalence for total land area. The trees varied from loblolly pine, yellow-poplar, shortleaf pine, white oak, eastern white pine, Virginia pine, and northern red oak.

Species	Acres	Percentage
Loblolly Pine	478,993	90.2%
Yellow-poplar	170,754	32.2%
Shortleaf pine	126,010	23.7%
Eastern White Pine	124,436	23.4%
White Oak	121,385	22.9%
Northern Red Oak	82,311	15.5%
Virginia Pine	81	0.02%