

Economic Contribution of the Agriculture Industry in New Hampshire

Calendar Year 2013

Prepared for New Hampshire Department of Agriculture

by

Daniel S. Lee

and

Mark Okrant

The Institute for New Hampshire Studies
Plymouth State University

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I. PROJECT DESCRIPTION

The Institute for New Hampshire Studies (INHS) estimated economic contribution of Agriculture on the state's economy during calendar year 2013, on behalf of the New Hampshire Department of Agriculture. Economic contribution was estimated in two broad categories – traditional agricultural production and agriculture-related tourism. In so doing, sales were estimated by detailed category, which were then entered into an input/output economic model to measure multiplier effects in terms of employment, labor income, output and state and local government taxes in New Hampshire that resulted from these sales. We believe that this study improves upon past studies by adopting updated and more detailed data that have recently become available. For the first time, INHS used more detailed visitor survey information obtained from TNS Global Market Research as part of their syndicated TravelsAmerica research program. Our calendar year 2013 study also adopted IMPLAN for an economic model to estimate multiplier effects. To place the 2013 economic contribution, which was estimated using the new methodology, in proper perspective, estimates for calendar year 2009 and calendar year 2011 were calculated using the same methodology.

II. DEFINITIONS OF KEY MEASURES

1. **Employment:** annual average number of jobs, including both full- and part-time jobs; for example, 10 jobs for the first half of the year and 20 jobs in the second half results in 15 average jobs for the year
2. **Labor income:** employee compensation (wages and salaries plus other compensations) and proprietor income
3. **Value added:** labor income, other types of property income (such as dividends, interest income, rent income, and profits), taxes on production and imports
4. **Output:** total value of production, which is the sum of value added and the cost of all the inter-industry purchases required for production
5. **Sales:** the consumer prices of products, which may not be the same as output depending upon the types of industry sectors. For example, within service sectors such as the hospitality industry, there is no difference between sales and output. In wholesale and retail trade, however, sales equal output plus producer prices; and sales equal output less inventories in goods-producing sectors such as agriculture and manufacturing.

III. IMPLAN MODEL AND DATA

The model used in this analysis was built by customizing the Impact Analysis for Planning (IMPLAN) regional input-output software. The first input-output model was developed by Dr. Wassily Leontieff to help the United States mobilize to meet the demand of World War II. For this work in input-output models, he won the Nobel Prize in Economic Science in 1973.

The input-output model was later applied to regional economies. With the enactment of the National Forest Management Act in 1976, the U.S. National Forest Services needed a systematic tool for evaluating the national forest management plans on local residents and businesses. Hence, the creation of the IMPLAN. The advancement of computer technologies made it possible to extrapolate, extend, and convert existing data to regional economies using non-survey methods, without the cost of onsite data collection.

Today, IMPLAN is widely used for evaluating economic impacts beyond the forest and logging sector. It traces impacts through direct, indirect, and induced effects. Direct effect is the initial expenditures, or production, made by the industry experiencing the economic change; indirect effect represents the effects of local inter-industry spending through backward linkages; and induced effect is the results of local spending of employees' wages and salaries for both employees of the directly affected industry, and the employees of the indirectly affected industries. Backward linkages are the tracking of industry purchases backward through the supply chain (Frances Day).

IMPLAN data is constructed primarily from federal government sources, including:

- U.S. Bureau of Economic Analysis Benchmark I/O Accounts of the U.S.
- U.S. Bureau of Economic Analysis Output Estimates
- U.S. Bureau of Economic Analysis REIS Program
- U.S. Bureau of Labor Statistics Covered Employment and Wages Program
- U.S. Bureau of Labor Statistics Consumer Expenditure Survey
- U.S. Census Bureau County Business Patterns Program
- U.S. Census Bureau Decennial Census and Population Surveys
- U.S. Census Bureau Economic Censuses and Surveys
- U.S. Department of Agriculture Crop and Livestock Statistics
- U.S. Geological Survey

IV. ASSUMPTIONS WITHIN THE ECONOMIC MODEL

All usual assumptions of the input-output model apply in this study.

- Constant returns to scale
 - As all inputs increase by a factor, output increases by the same factor. For example, output doubles if all inputs double.
- National production coefficients and margins
 - An industry is assumed to have identical production functions and margins in all regions in the country.
- No substitution among inputs
 - No substitution among inputs is assumed for simplicity. In practice, firms may look for an alternative for an input that becomes increasingly more expensive, which may happen if its demand increases and/or its supply falls.
- No constraints to the supply of commodity

V. ECONOMIC CONTRIBUTION ESTIMATES

Before estimating total economic contributions of Agriculture on the state's economy, direct sales had to be estimated first. Table 1 shows sales estimates in two broad categories: 1) traditional agricultural production and 2) agriculture-related tourism. Hereafter, the agriculture sector refers to both these categories. These sales data were then entered into the input/output economic model to estimate the industry's multiplier effects on the state's broad economy.

Table 1: Estimated Sales in New Hampshire's Agriculture

	Sales	IMPLAN Sector 2013	NAICS
<i>Agricultural Production</i>			
Farming			
Livestock and products			
Meat animals and other livestock			
Cattle and calves	\$16	11	112111
Hogs and pigs	\$1	14	112210
Sheep and other livestock	\$9	14	1124
Dairy products	\$56	12	112120
Poultry and poultry products	\$19	13	1123
Crops			
Hay, silage, etc.	\$5	10	11194
Vegetables	\$11	3	11121
Fruits and nuts	\$11	4	11133
Greenhouse, nursery and mushroom products	\$56	6	111421
Other crops	\$11	10	11199
Agricultural services	\$49	19	115
Other Horticultural Plants Production	\$68	6	111421
Wineries	\$23	109	31213
<i>Subtotal for agricultural production</i>	<i>\$336</i>		
<i>Agriculture-related Tourism</i>			
Groceries	\$78	400	445
Gasoline	\$213	402	4471
Shopping/Gifts/Souvenirs	\$45	406	453
Transportation	\$83	412	485
Parking and tolls	\$5	470	5619
Entertainment (excluding gaming)/Admissions	\$18	493	7121
Amenities (golf fees, spa, health club, ski passes, etc.)	\$35	497	71394
Lodging	\$318	499	7211
Food/Beverage/Dining (excluding groceries)	\$407	503	722
Other	\$9	512	8129
<i>Subtotal for agriculture-related tourism</i>	<i>\$1,213</i>		
Total	\$1,549		

Farming

Sales of farm products were taken from the U.S. Bureau of Economic Analysis (SA45 Farm Income and Expenses). The values for sub-categories under “Meat animals and other livestock” were not released at the time of the study. Thus, these values were estimated by using their shares in total of 2012 data.

Agricultural services

Agricultural services includes support activities for crop (NAICS 1151) and animal production (NAICS 1152). The 2011 value was taken from the U.S. Department of Agriculture’s New England Agricultural Statistics 2012 (the Net Farm Income Table), which was then multiplied by the growth rate of farm products sales between 2011 and 2013, in order to estimate the 2013 value.

Other Horticultural Plants Production

Other horticultural plants are defined as plants grown by wholesale and retail trade businesses, including garden supply centers and nurseries. They are not reflected in the U.S. BEA’s Farm Income and Expenses report, which only includes horticultural production on farms. Thus, the value of these other horticultural plants production was estimated. The 2007 value was taken from the 2009 New England Nursery Association report, which was then multiplied by the growth rate of farm products sales between 2007 and 2013, in order to estimate the 2013 value.

Wineries

Wineries in New Hampshire grow grapes, although wineries are considered to be manufacturers by the federal government. The 2013 sales at wineries (NAICS 31213) was taken from IMPLAN 2013 for New Hampshire (IMPLAN Sector 109).

Agriculture-related tourism

Table 1 shows visitor spending by category, which was estimated using the following formula.

$$\text{Total Spending by Ag-T} = (\# \text{ of all visitor parties}) * (\% \text{ of ag-T}) * (\text{per party spending by ag-T})$$

The number of all visitor parties during 2013 was taken from the Institute for New Hampshire Studies, the annual barometer report for calendar year 2013. The percentage of agricultural tourism was obtained from TNS Global Market Research as part of their syndicated TravelsAmerica research program. The TNS survey reported that 11.5% of all visitors to the state came for ag-tourism related activities as the purpose of the trip. The ag-tourism related activities included 1) Farms/Ranches/Ag tour; 2) Special events/Festivals; and 3) Rural sightseeing. The purpose of the trip is defined as the primary or secondary purpose of the trip, which isn't the same as the share of visitors who engaged in the ag-related activities. To measure economic impacts, it is more appropriate to use the purpose of the trip. The use of the share of visitors who engaged in the ag-related activities would overestimate the impacts. Per party spending also came from the TNS national visitor survey. This new detailed ag-tourism survey information was collected from the period of the third quarter 2013 through the third quarter 2014; the data is available for July 2013 and after. Despite that the period of the data (July 2013-September 2014) doesn't exactly match the study period of calendar year 2013, it was used under the assumption that visitor behavior doesn't change over such a short period of time.

Multiplier Effects

The sales estimates in Table 1 were entered into IMPLAN in order to estimate their multiplier effects on the state's broader economy. The agriculture sector's contribution spreads across the state's economy by creating and supporting jobs, incomes, and taxes. The agriculture sector supports its supply industries in the region by making purchases from them (indirect effect). In addition, workers in the agriculture sector and its supply industries spend their earnings in the region's services industries (induced effect). For example, Table 2 shows that there were 20,072 jobs in the state's agriculture sector. These 20,072 jobs in the agriculture sector supported an additional 2,629 jobs in its supporting industries, such as trucking and wholesale trade. These 20,072 agricultural jobs and 2,629 jobs in its supporting industries together supported an additional 3,351 jobs in services sectors, such as grocery stores, hospitals, gas station, utility, restaurants...

Table 2. Summary of Economic Contributions, 2013

Contribution Type	Employment	Labor Income	Value Added	Output
Direct Effect	20,072	\$395	\$719	\$1,271
Indirect Effect	2,629	\$123	\$229	\$374
Induced Effect	3,351	\$147	\$253	\$415
Total Effect	26,052	\$665	\$1,201	\$2,060

Figure 1. Direct, Indirect, and Induced Effect by Category, 2013

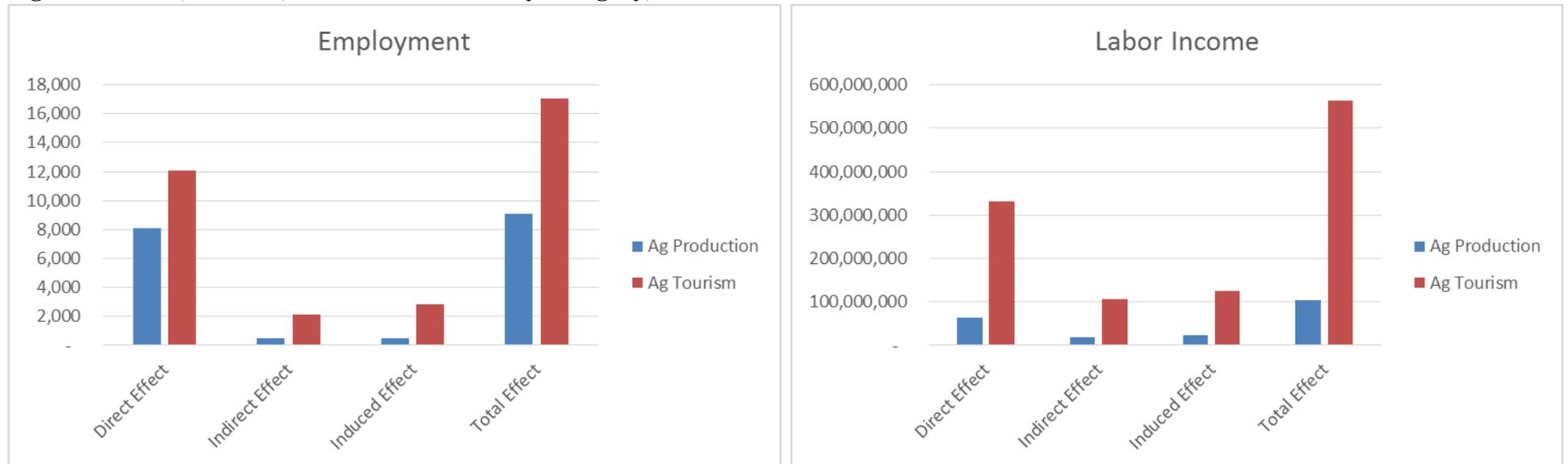


Table 3 shows top 25 industries supported by *agricultural production*, in terms of employment. The largest employment contribution was on “Greenhouse, nursery, and floriculture production”. A total of 4,177 jobs in this sector was supported by agricultural production. Note that this sector includes plants grown by wholesale and retail trade businesses (such as, garden supply centers and nurseries) as well as horticultural production on farms.

Table 3: Top 25 Industries Affected by Agricultural Production, Employment

Sector	Description	Direct	Indirect	Induced	Total
0	Total	8,030	492	513	9,035
6	Greenhouse, nursery, and floriculture production	4,134	43	0	4,177
19	Support activities for agriculture and forestry	877	189	0	1,066
12	Dairy cattle and milk production	969	1	0	970
4	Fruit farming	636	15	0	651
10	All other crop farming	489	20	0	509
14	Animal production, except cattle and poultry and eggs	306	6	0	312
3	Vegetable and melon farming	222	0	0	223
11	Beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming	158	14	0	172
13	Poultry and egg production	166	4	0	170
109	Wineries	74	1	0	75
395	Wholesale trade	0	40	11	51
440	Real estate	0	15	26	40
501	Full-service restaurants	0	2	30	33
482	Hospitals	0	0	30	30
502	Limited-service restaurants	0	2	23	26
400	Retail - Food and beverage stores	0	0	21	21
405	Retail - General merchandise stores	0	1	16	17
475	Offices of physicians	0	0	16	16
411	Truck transportation	0	12	3	14
483	Nursing and community care facilities	0	0	14	14
464	Employment services	0	6	8	13
503	All other food and drinking places	0	1	12	13
448	Accounting, tax preparation, bookkeeping, and payroll services	0	9	4	12
437	Insurance carriers	0	4	8	12

Table 4 shows top 25 industries supported by *agriculture-related tourism*, in terms of employment. The largest employment contribution was on “All other food and drinking places”. A total of 5,525 jobs in this sector was supported by agriculture-related tourism.

Table 4: Top 25 Industries Affected by Agriculture-related Tourism, Employment

Sector	Description	Direct	Indirect	Induced	Total
0	Total	12,042	2,137	2,838	17,017
503	All other food and drinking places	5,397	64	65	5,525
499	Hotels and motels, including casino hotels	3,046	18	34	3,098
402	71 Arts- entertainment & recreation	881	172	234	1,287
411	72 Accommodation & food services	1,001	24	30	1,055
497	Fitness and recreational sports centers	841	12	18	872
394	62 Health & social services	402	97	324	822
427	92 Government & non NAICs	0	401	244	645
414	81 Other services	0	223	157	379
493	Museums, historical sites, zoos, and parks	249	0	4	253
464	Employment services	0	191	42	233
501	Full-service restaurants	0	32	168	200
512	Other personal services	157	3	15	175
482	Hospitals	0	0	167	167
502	Limited-service restaurants	0	17	129	146
41	31-33 Manufacturing	0	103	41	144
461	Management of companies and enterprises	0	116	16	132
448	Accounting, tax preparation, bookkeeping, and payroll services	0	72	21	94
475	Offices of physicians	0	0	90	90
468	Services to buildings	0	61	26	87
470	Other support services	68	7	3	77
483	Nursing and community care facilities	0	0	76	76
504	Automotive repair and maintenance, except car washes	0	22	52	74
457	Advertising, public relations, and related services	0	53	11	64
511	Dry-cleaning and laundry services	0	44	16	60

Table 5 shows top 25 industries supported by *agricultural production*, in terms of labor income. The largest labor income contribution was on “Greenhouse, nursery, and floriculture production”. A total of \$36.4 million in this sector was supported by the agricultural production. Note that this sector includes plants grown by wholesale and retail trade businesses (such as, garden supply centers and nurseries) as well as horticultural production on farms.

Table 5: Top 25 Industries Affected by *Agricultural Production*, Labor Income

Sector	Description	Direct	Indirect	Induced	Total
0	Total	62.8	16.5	22.6	101.9
6	Greenhouse, nursery, and floriculture production	36.0	0.4	0.0	36.4
19	Support activities for agriculture and forestry	18.5	4.0	0.0	22.5
395	Wholesale trade	0.0	3.6	0.9	4.5
10	All other crop farming	3.6	0.1	0.0	3.7
109	Wineries	2.3	0.0	0.0	2.4
4	Fruit farming	2.2	0.1	0.0	2.2
482	Hospitals	0.0	0.0	2.0	2.0
475	Offices of physicians	0.0	0.0	1.9	1.9
461	Management of companies and enterprises	0.0	0.8	0.3	1.1
437	Insurance carriers	0.0	0.4	0.7	1.0
3	Vegetable and melon farming	0.9	0.0	0.0	0.9
411	Truck transportation	0.0	0.7	0.1	0.8
440	Real estate	0.0	0.3	0.5	0.8
435	Securities and commodity contracts intermediation and brokerage	0.0	0.2	0.5	0.8
501	Full-service restaurants	0.0	0.1	0.7	0.7
448	Accounting, tax preparation, bookkeeping, and payroll services	0.0	0.5	0.2	0.7
504	Automotive repair and maintenance, except car washes	0.0	0.1	0.6	0.6
502	Limited-service restaurants	0.0	0.1	0.6	0.6
433	Monetary authorities and depository credit intermediation	0.0	0.2	0.3	0.6
447	Legal services	0.0	0.2	0.3	0.5
400	Retail - Food and beverage stores	0.0	0.0	0.5	0.5
483	Nursing and community care facilities	0.0	0.0	0.5	0.5
464	Employment services	0.0	0.2	0.3	0.5
473	Junior colleges, colleges, universities, and professional schools	0.0	0.0	0.5	0.5

Table 6 shows top 25 industries supported by *agriculture-related tourism*, in terms of labor income. The largest labor income contribution was on “All other food and drinking places”. A total of \$147.8 million in this sector was supported by the agriculture-related tourism.

Table 6: Top 25 Industries Affected by Agriculture-related Tourism, Labor Income

Sector	Description	Direct	Indirect	Induced	Total
0	Total	332.0	106.6	124.8	563.4
503	All other food and drinking places	144.4	1.7	1.7	147.8
499	Hotels and motels, including casino hotels	95.1	0.6	1.0	96.7
402	71 Arts- entertainment & recreation	26.5	5.1	6.8	38.5
411	72 Accommodation & food services	31.7	1.2	1.4	34.3
394	62 Health & social services	10.2	6.8	15.4	32.4
414	81 Other services	0.0	15.0	10.1	25.1
427	92 Government & non NAICs	0.0	12.8	10.5	23.3
461	Management of companies and enterprises	0.0	11.5	1.6	13.1
497	Fitness and recreational sports centers	12.3	0.2	0.3	12.8
41	31-33 Manufacturing	0.0	8.1	3.3	11.4
482	Hospitals	0.0	0.0	11.0	11.0
475	Offices of physicians	0.0	0.0	10.2	10.2
464	Employment services	0.0	7.5	1.7	9.2
493	Museums, historical sites, zoos, and parks	5.9	0.0	0.1	6.0
448	Accounting, tax preparation, bookkeeping, and payroll services	0.0	4.2	1.2	5.4
512	Other personal services	4.1	0.1	0.4	4.5
501	Full-service restaurants	0.0	0.7	3.8	4.5
504	Automotive repair and maintenance, except car washes	0.0	1.3	3.0	4.3
454	Management consulting services	0.0	2.9	0.9	3.8
502	Limited-service restaurants	0.0	0.4	3.1	3.5
447	Legal services	0.0	1.6	1.9	3.5
518	Postal service	0.0	2.8	0.7	3.5
511	Dry-cleaning and laundry services	0.0	2.3	0.8	3.1
507	Commercial and industrial machinery and equipment repair and maintenance	0.0	2.5	0.5	2.9

Table 7 shows the government taxes and receipts the agriculture sector contributed. The agriculture sector (agricultural production and agriculture-related tourism combined) generated \$128.4 million of tax revenues to the state and local governments from all sources.

Table 7: Tax Contributions

Description	Employee Compensation	Proprietor Income	Tax on Production and Imports	Households	Corporations
<i>State and Local</i>					
Dividends					0.1
Social Ins Tax- Employee Contribution	0.3				
Social Ins Tax- Employer Contribution	0.5				
Tax on Production and Imports: Sales Tax			72.8		
Tax on Production and Imports: Property Tax			38.9		
Tax on Production and Imports: Motor Vehicle Lic			0.6		
Tax on Production and Imports: Severance Tax					
Tax on Production and Imports: Other Taxes			3.4		
Tax on Production and Imports: S/L NonTaxes			0.4		
Corporate Profits Tax					7.6
Personal Tax: Income Tax				0.8	
Personal Tax: NonTaxes (Fines- Fees				1.4	
Personal Tax: Motor Vehicle License				0.8	
Personal Tax: Property Taxes				0.5	
Personal Tax: Other Tax (Fish/Hunt)				0.4	
Total State and Local Tax	0.7		116.1	3.9	7.7

Sales tax includes taxes on motor fuels, tobacco products, alcoholic beverages, meals, and hotel occupancy.

The distribution of the column total of “Tax on Production and Imports” to individual items (such as, sales tax and property tax) was adjusted, using the New Hampshire Department of Administrative Services’ Monthly Revenue Focus. IMPLAN tax estimates are industry-specific and accurate regarding column totals (e.g. Tax on Production and Imports), but the distribution of column totals to sub tax categories (such as sales tax and property tax) within column is not industry-specific.

VI. NEW DATA, NEW MODEL, AND NEW ESTIMATES FOR 2009, 2011 AND 2013

Contributions of the agriculture sector were estimated for calendar year 2009 and 2011, using the new methodology that was introduced in the calendar year 2013 study. The TNS survey data that helped estimate the share of agriculture-related tourism in total party trips to the state and their spending pattern in the calendar year 2013 study became available since 2013 and aren't available for periods prior to 2013. Thus, the same visitor survey information was used for contribution estimates of 2009 and 2011, under the assumption that visitor behaviors do not change much over such short time periods. Table 8 compiles these contribution estimates for all three years so as to make it easier to identify trends in the state's agriculture sector, which is also broken down by traditional agricultural production and agriculture-related tourism. Figure 2 and 3 clearly illustrate a few important trends: 1) economic contribution of agriculture-related tourism is much larger than that of traditional agricultural production; 2) traditional agricultural production grew in employment since 2009 but declined in labor income (wages and salaries plus proprietor income), which suggests declining average labor income per employee.

Table 8: Contribution Estimates of New Hampshire's Agriculture in 2009, 2011, and 2013

	Employment			Labor Income (millions of dollars)		
	Ag Production	Ag Tourism	Grand Total	Ag Production	Ag Tourism	Grand Total
2009						
Direct Effect	7,271	10,517	17,788	\$103	\$267	\$370
Indirect Effect	542	1,823	2,364	\$18	\$83	\$100
Induced Effect	861	2,486	3,346	\$35	\$101	\$136
Total Effect	8,673	14,825	23,498	\$156	\$451	\$607
2011						
Direct Effect	5,426	11,873	17,299	\$98	\$299	\$398
Indirect Effect	370	1,987	2,357	\$23	\$95	\$119
Induced Effect	728	2,364	3,092	\$31	\$100	\$131
Total Effect	6,524	16,224	22,747	\$153	\$495	\$647

2013						
Direct Effect	8,030	12,042	20,072	\$63	\$332	\$395
Indirect Effect	492	2,137	2,629	\$17	\$107	\$123
Induced Effect	513	2,838	3,351	\$23	\$125	\$147
Total Effect	9,035	17,017	26,052	\$102	\$563	\$665

Figure 2. Direct Effect of New Hampshire's Agriculture

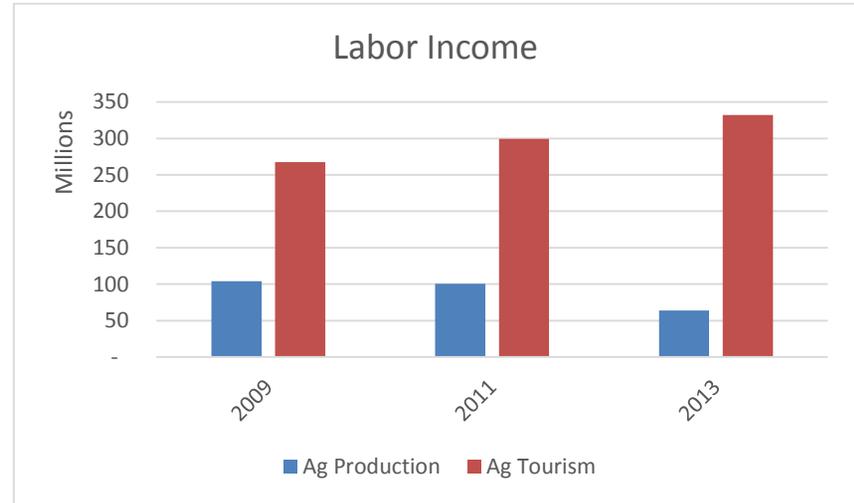
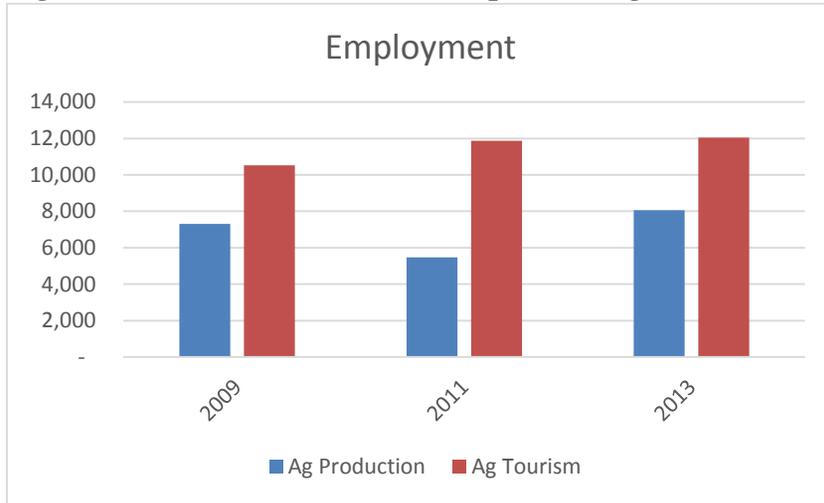
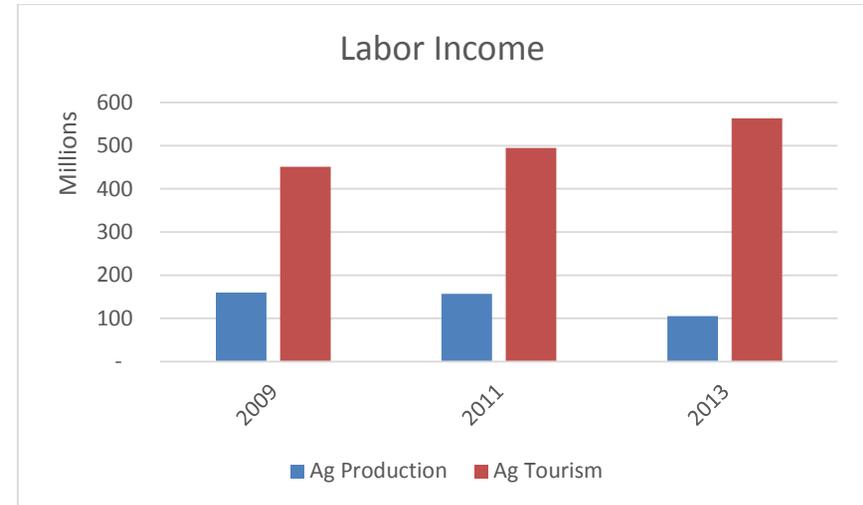
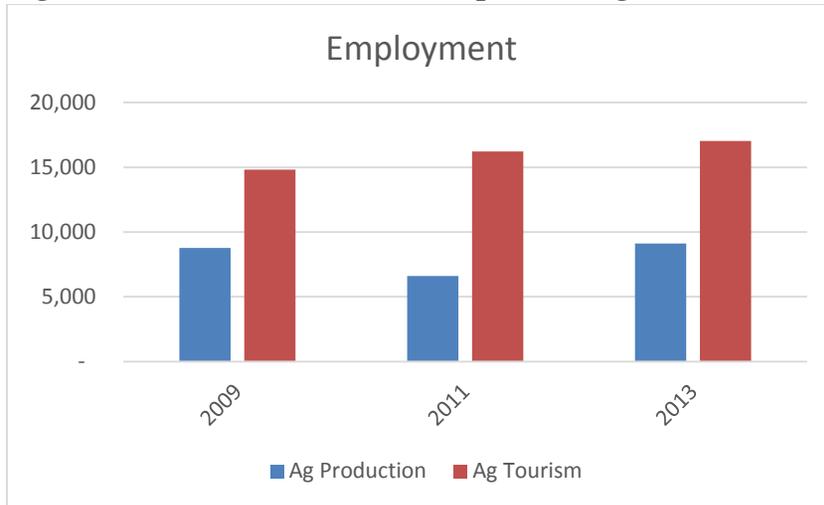


Figure 3. Total Effect of New Hampshire's Agriculture



VII. APPENDIX

CHANGES IN NEW AND OLD METHODOLOGY

The introduction of new methodology in the calendar year 2013 study made it necessary to estimate economic contributions of agriculture in past years so as to discern trends in the state's agriculture. Hence, reported are estimates of the state's agriculture in calendar year 2009 and calendar year 2011. There are two important distinctions between past and new estimates in these two years: 1) economic contributions of agriculture-related tourism was estimated to be larger than previously estimated; and 2) multiplier effects of sales per dollar spent were estimated to be smaller than previously estimated. This section explains causes of these two differences.

Why are revised economic contribution estimates of agriculture-related tourism larger?

The Institute for New Hampshire Studies purchased the full access to the TNS national visitor survey database, which recently added additional agriculture-related tourism survey questions in 2013 and after. Although this new information was not available for 2009 and 2011, it was used for contribution estimates of 2009 and 2011, under the assumption that visitor behaviors change little over such short time periods. The use of this new information led to revised economic contribution estimates significantly larger than the ones in the past studies. For example, the revised estimate shows that visitors who came to the state for agriculture-related activities as the purpose of the trip spent \$781 million during fiscal year 2011, compared to \$372 million previously estimated. The purpose of the trip is defined as the primary or secondary purpose of the trip, which isn't the same as the share of visitors who engaged in the ag-related activities. To measure economic impacts, it is more appropriate to use the purpose of the trip. The use of the share of visitors who engaged in the ag-related activities would overestimate the impacts. Past estimates were largely based on other relevant but old studies, including the 2002 Agricultural Fairs in NH.

Why are indirect and induced effects in the revised economic contribution estimates smaller?

The revised multiplier effect estimates (of IMPLAN) appear to be smaller than old estimates of the INHS in-house model. However, it is important to note that the two economic models are not directly comparable. Not only are there differences caused by the level of sophistication of the model, but also by varying definitions of variables, sources of data, and industry classification. The following is the list of major differences between the two models, which led to the differences in the economic contribution estimates.

1. **The primary variable:** The INHS model uses sales as the primary variable, while IMPLAN uses output. In services-providing industries such as the hospitality industry, sales and output should be the same, all else being equal. However, sales may not equal output in other industries. For example, in wholesale and retail trade, output is gross margin, which is sales minus producers' prices; in manufacturing, output is sales minus inventories.
2. **The source of primary data:** The source of data adds another layer to the difference in the primary variable. The INHS's sales data come from the U.S. Economic Census, while IMPLAN's output is obtained from the U.S. Bureau of Economic Analysis (BEA). The way in which the two agencies collect the data may not be identical for the following

reasons. First, while BEA output is reported at the corporate level, the Economic Census is at the establishment level. Secondly, the two U.S. agencies may not define each industry in the same manner. Thirdly, sales reported in the Economic Census exclude the production of foreign subsidiaries, while the BEA's output doesn't. This last point is a cause for a large discrepancy in some industries like manufacturing which has a large foreign manufacturer such as BAE systems.

3. **The definition of income:** Income refers to personal income in the INHS model, while it means labor income in IMPLAN. Both income measures come from BEA. Personal income is a broader income category than labor income; personal income represents labor income plus other sources of income, including rental income, interest income, and dividend income.
4. **The base year of the data:** IMPLAN model is based on calendar year, while the INHS model is based on fiscal year. There is a difference of six months between the two periods. For example, fiscal year 2012 is July 2011 through June 2012, while calendar year 2012 is January 2012 through December 2012.
5. **The level of industry aggregation:** IMPLAN model groups industries based on the level of similarity in the production function; thus, contributions are estimated at finer levels of industries than the INHS model which groups industries at the 2-digit level of the North American Industry Classification System. IMPLAN includes more than 400 industries, compared to INHS' 11 industries.
6. **The governments as an industry:** This is related to Point 5 above. In IMPLAN, the activity of the governments are divided into multiple categories including the following three – 1) government enterprises (such as electric utilities and local transit); 2) indirect business taxes (such as rooms and meals tax); and 3) the governments as the provider of public services (such as police, fire fighter, and road maintenance). Only the first category of government enterprises is included in the processing sector and used to measure indirect/induced effects. In the INHS model, on the other hand, all government-related activities are included in the processing sector as one government sector, and used to measure indirect/induced effects. This is largely responsible for larger indirect effects estimated by the INHS model. The greater portion of inputs (from governments in this case) that is purchased locally, the larger indirect effects are.
7. **The share of household consumption purchased locally:** The INHS model assumes 49 percent of the state's household consumption during 2012 was purchased locally, while IMPLAN assumes only 25 percent was supplied locally. This is a major cause for discrepancies in induced effects. The more earnings spent locally, the larger induced effects are.