

Contribution of Agriculture to Pinal County Economy in 2016

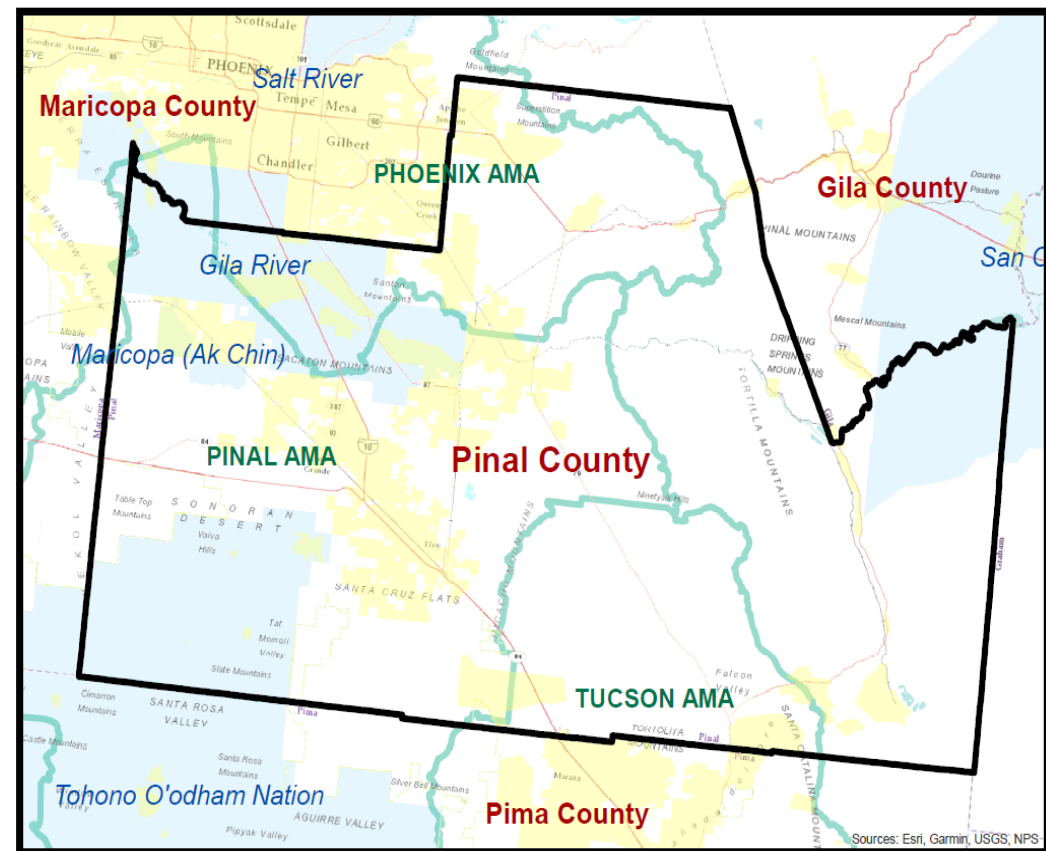
Preliminary Results

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**Agricultural &
Resource Economics**

Overview

- Profile of Pinal County agriculture
- Economic contributions of on-farm agriculture
- Pinal County's agribusiness industries
- Economic contribution of on-farm agriculture and related agribusinesses
- Potential effects from reduced on-farm production as a result of fallowing

Profile of Pinal County Agriculture

2012 Census of Agriculture

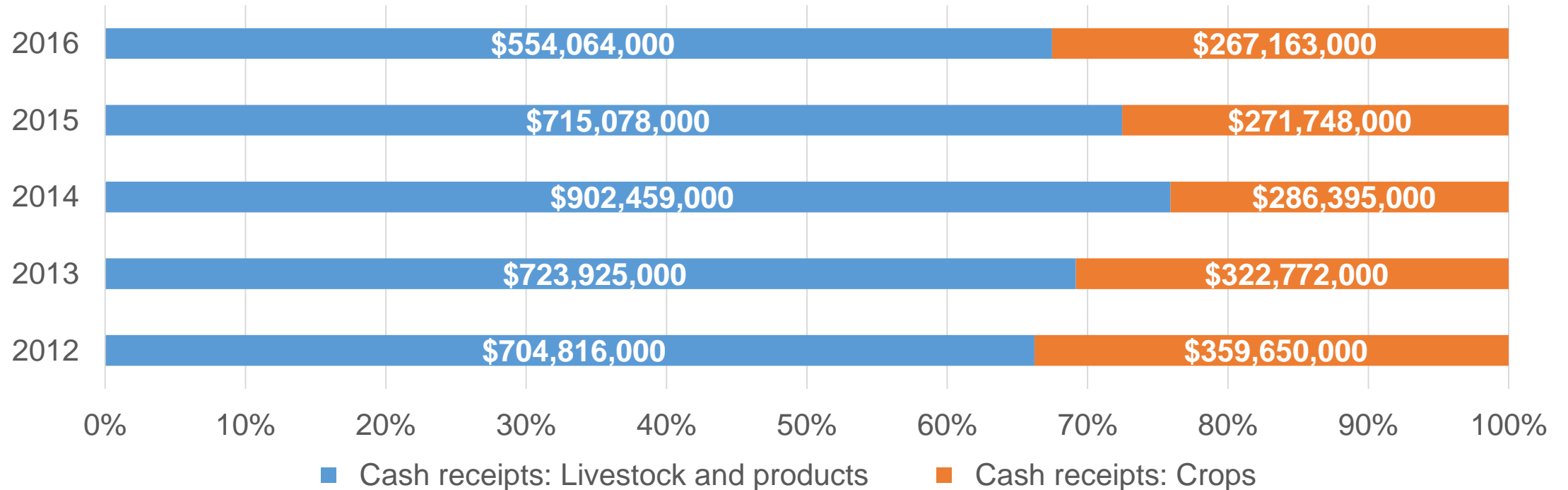
Pinal County ranks high among U.S. counties

- Top 2% of counties for total agricultural sales
- Top 1% for sales of...
 - Animal products
 - Cotton and cottonseed
 - Milk
 - Hay and other crops (alfalfa)

Item	Top %
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD (\$1,000)	
Total value of agricultural products sold	2
Value of crops including nursery and greenhouse	3
Value of livestock, poultry, and their products	1
VALUE OF SALES BY COMMODITY GROUP (\$1,000)	
Grains, oilseeds, dry beans, and dry peas	25
Cotton and cottonseed	1
Vegetables, melons, potatoes, and sweet potatoes	7
Fruits, tree nuts, and berries	6
Other crops and hay	1
Cattle and calves	2
Milk from cows	1
TOP CROP ITEMS (acres)	
Cotton, all	3
Forage-land for all hay & haylage, grass silage, % greenchop	4
Barley for grain	4
Corn for silage	4
TOP LIVESTOCK INVENTORY ITEMS (number)	
Cattle and calves	1
Colonies of bees	7

Predominately livestock producing county

Pinal County Cash Receipts



Pinal County Top Commodities: Milk, Beef, Cotton, & Feed Crops

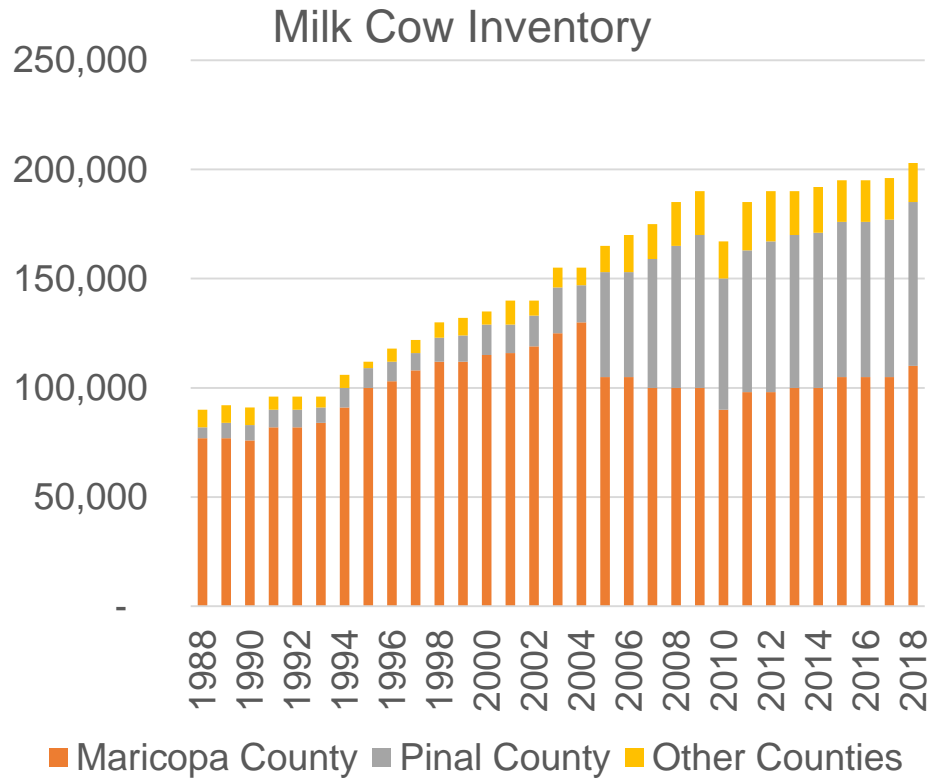
Livestock Commodities

- ~50/50 split between cattle & calf sales and milk sales
- 45% of Arizona's cattle and calf sales
 - 98% of Pinal County cattle sales from farms with > 500 head
- 39% of Arizona's milk production

Crop Commodities

- Cotton is top crop by acreage and value of sales
 - Accounts for 41% of bales produced and 43% of acreage in Arizona
- Feed crops – alfalfa hay, corn silage, barley, sorghum

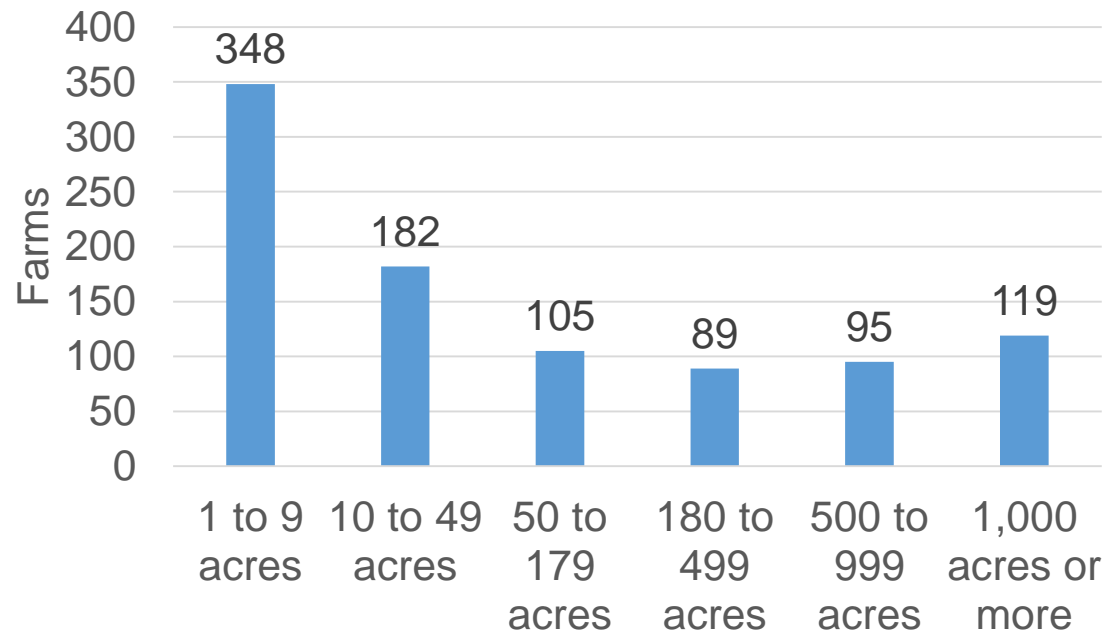
Pinal County is an important contributor to Arizona milk supplies



	Population	Milk Sales	State Share of Population	State Share of Milk Sales
Arizona Total	6,498,569	\$762,957,000	100%	100%
Maricopa	3,884,705	\$398,256,000	60%	52%
Pima	990,380	\$0	15%	0%
Pinal	389,192	\$294,886,000	6%	39%
All Other Counties	1,234,292	\$69,815,000	19%	9%

Most farms are considered small-scale

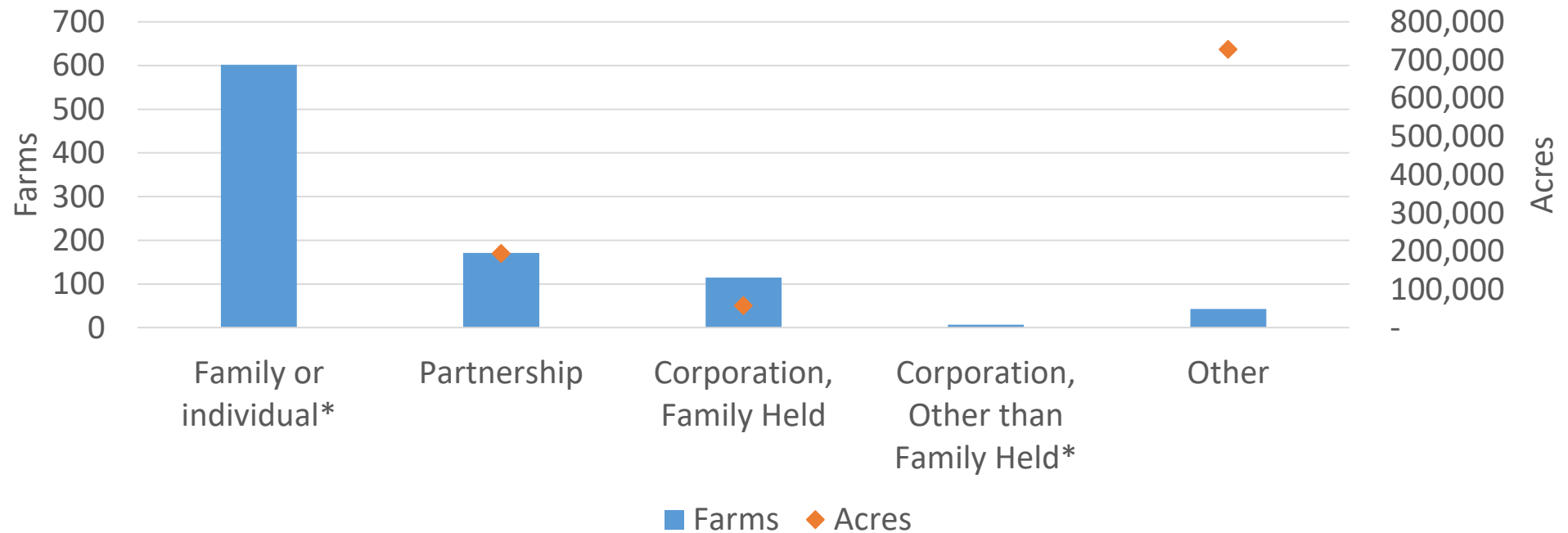
Acresage



Sales

Farms by value of sales	Farms	Percent
Less than \$1,000	256	27%
\$1,000 to \$2,499	65	7%
\$2,500 to \$4,999	52	6%
\$5,000 to \$9,999	99	11%
\$10,000 to \$24,999	100	11%
\$25,000 to \$49,999	54	6%
\$50,000 to \$99,999	31	3%
\$100,000 to \$249,999	78	8%
\$250,000 to \$499,999	58	6%
\$500,000 or more	145	15%
Total	938	100%

Most farms are family or individually-owned



*acreage data not disclosed to protect confidentiality of individual farm data

Contribution of On-Farm Agriculture to the Pinal County Economy

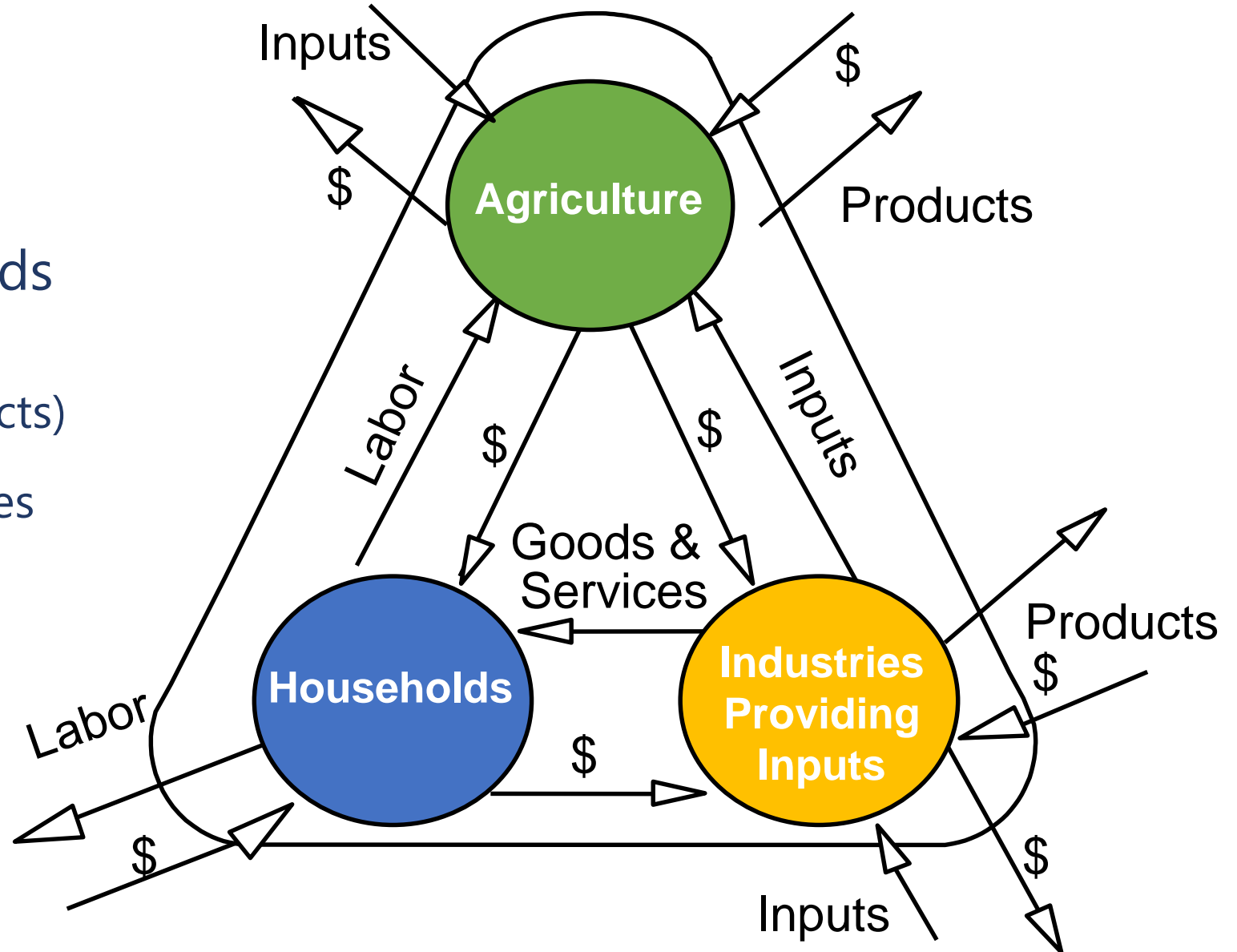
2016 Economic Contribution Analysis

Contribution of On-Farm Agriculture Extends Beyond Farm

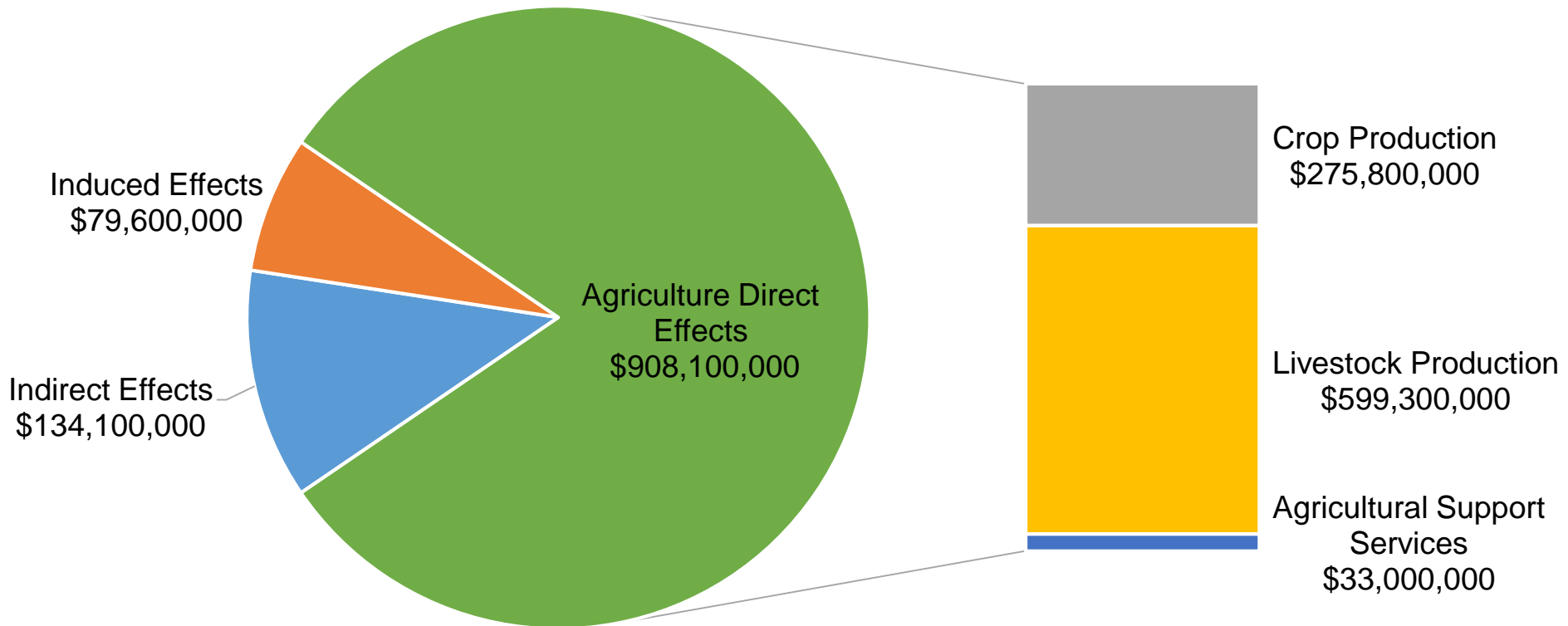
- Direct contribution est. through agricultural cash receipts
 - 2016 Pinal County agricultural cash receipts and other farm income = \$875 million
 - Estimated agricultural support sales = \$33 million
- “Ripple” of economic activity stimulated in other industries to:
 - Meet farmer & rancher demand for inputs (indirect multiplier effects)
 - Meet consumer demand of households employed in ag (induced multiplier effects)
- IMPLAN (input-output model) used to measure multiplier effects

Multiplier Effects

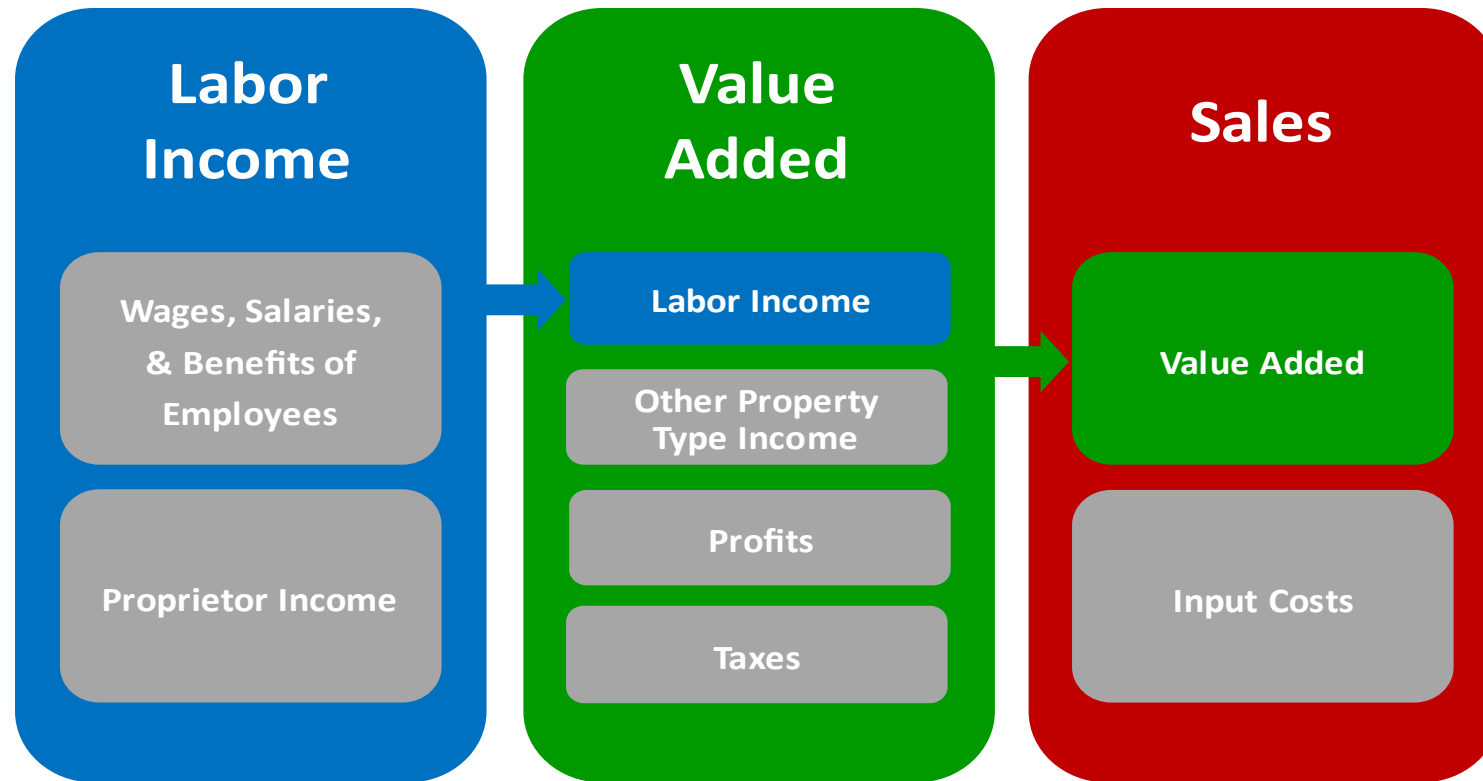
- Ripple of economic activity generated to satisfy demands for goods and services
 - Business demand for inputs/supplies (indirect effects)
 - Employee demand for household goods and services (induced effects)
- Metrics used to measure industry's contribution
 - Sales
 - Value Added
 - Income
 - Jobs



Economic Contribution of On-Farm Agriculture to Pinal County Sales, 2016



Measuring Economic Contributions



Economic Contribution of On-Farm Agriculture to Pinal County Economy, 2016

Impact Type	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Sales (Output)	\$908,100,000	\$134,100,000	\$79,600,000	\$1,121,800,000
A subset of sales:				
Value Added	\$273,000,000	\$58,500,000	\$41,300,000	\$372,800,000
A subset of value added:				
Labor Income	\$190,500,000	\$31,700,000	\$17,000,000	\$239,200,000
Employment	3,804	732	611	5,147

Role of Agriculture and Agribusiness in Pinal County

Food manufacturing and other agribusiness

- Food manufacturing largest manufacturing sector in the county, accounts for > 1/4 of manufacturing jobs and 1/3 of manufacturing wages
- Largest is dairy product manufacturing industry, accounting for 18% of county private sector jobs
- Agriculture-related wholesale trade accounts for 23% of wholesale trade jobs and 19% of wholesale wages

On-Farm Agriculture & Agribusiness Contributions to the Economy

2016 Economic Contribution Analysis

Agriculture & Agribusiness Industries

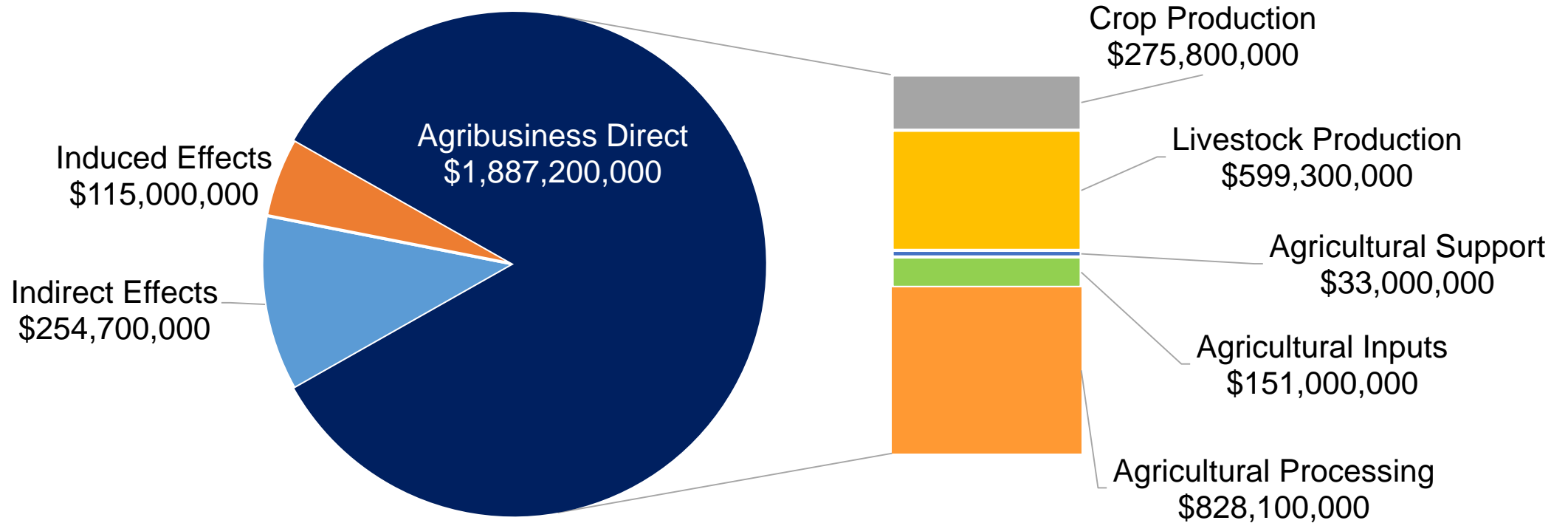
- **On-Farm Agriculture**

- Crop production
- Livestock production
- Agricultural support services

- **Agribusiness**

- Supply inputs and provide services that support on-farm production
 - Fertilizer manufacturers, farm machinery manufacturers
- Process or manufacture agricultural products (food and fiber processing)
 - Fluid milk manufacturing, animal processing, other snack food manufacturing, fabric mills

Economic Contribution of On-Farm Agriculture & Agribusiness to Pinal County Sales, 2016



Agribusiness Industries in Pinal County

IMPLAN Code	NAICS	Industry Description
66	311119	Other animal food manufacturing
84	311511	Fluid milk manufacturing
87	311514	Dry, condensed, and evaporated dairy product manufacturing
89	311611	Animal, except poultry, slaughtering
90	311612	Meat processed from carcasses
94	311811-2	Bread and bakery product, except frozen, manufacturing
95	311813	Frozen cakes and other pastries manufacturing
98	31183	Tortilla manufacturing
100	311919	Other snack food manufacturing
109	31213	Wineries
113	31321	Broadwoven fabric mills
169	325311	Nitrogenous fertilizer manufacturing
171	325314	Fertilizer mixing
262	333111	Farm machinery and equipment manufacturing

- Nearly two-thirds of agribusiness sales came from Pinal County businesses involved in:
 - fluid milk manufacturing
 - dry, condensed, and evaporated dairy product manufacturing
 - snack food manufacturing

Economic Contribution of On-Farm Agriculture & Agribusiness to Pinal County Economy, 2016

Impact Type	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Sales (Output)	\$1,887,200,000	\$254,700,000	\$115,000,000	\$2,256,900,000
A subset of sales:				
Value Added	\$433,500,000	\$117,200,000	\$60,400,000	\$611,100,000
A subset of value added:				
Labor Income	\$266,400,000	\$65,600,000	\$24,800,000	\$356,800,000
Employment	5,150	1,472	895	7,516

Top 10 Industries Supported by Agriculture & Agribusiness Multiplier Effects

Rank	IMPLAN Industry	Indirect & Induced Effects	
		Employment	Labor Income
1	Wholesale trade	259	\$15,600,000
2	Real estate	209	\$2,400,000
3	Truck transportation	170	\$13,200,000
4	Other local government enterprises	100	\$6,500,000
5	Marketing research and all other miscellaneous professional, scientific, and technical services	73	\$1,000,000
6	Services to buildings	69	\$800,000
7	Limited-service restaurants	67	\$1,100,000
8	Maintenance and repair construction of nonresidential structures	60	\$3,600,000
9	Retail - General merchandise stores	58	\$1,900,000
10	Accounting, tax preparation, bookkeeping, and payroll services	45	\$900,000

Potential Effects of Reduced Agricultural Production

Fallowing cotton and alfalfa acreage

Critical Assumptions

300,000 AF Cutback

No Substitute Water

- Instead of switching to groundwater, farmers fallow crops & forgo net revenues from production

Average Water Application Rate

- Gravity irrigation (AZ)
 - Cotton - 4.6 AF/acre
 - Alfalfa - 5.5 AF/acre

Average Yield

- Yield (Pinal County)
 - Cotton - 1,499 lb/acre
 - Alfalfa - 8.05 tons/acre

Backward Linkages Only

- Reductions in economic activity
 - Fewer inputs purchased by farmers
 - Fewer people employed in agriculture

Following Cotton

- Scenario: fallow 65,200 acres of cotton
 - 203,700 fewer bales of cotton produced
 - \$65.1 million in reduced cotton sales

Impact Type	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Sales (Output)	-\$65,100,000	-\$24,700,000	-\$8,500,000	-\$98,300,000
A subset of sales:				
Value Added	-\$18,800,000	-\$11,800,000	-\$4,400,000	-\$35,000,000
A subset of value added:				
Labor Income	-\$15,600,000	-\$8,400,000	-\$1,800,000	-\$25,800,000
Employment	-244	-174	-65	-484

Following Alfalfa

- Scenario: fallow 54,545 acres of alfalfa
 - 440,000 fewer tons of alfalfa produced
 - \$66.7 million in reduced cotton sales

Impact Type	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Sales (Output)	-\$66,700,000	-\$30,000,000	-\$7,500,000	-\$104,200,000
A subset of sales:				
Value Added	-\$15,400,000	-\$14,200,000	-\$3,900,000	-\$33,500,000
A subset of value added:				
Labor Income	-\$12,200,000	-\$8,900,000	-\$1,600,000	-\$22,700,000
Employment	-56	-198	-57	-311

Following Cotton and Alfalfa

- Scenario: fallow 32,609 acres of cotton and 27,273 acres of alfalfa
 - 102,000 fewer bales of cotton produced; 220,000 fewer tons of alfalfa produced
 - \$65.9 million in reduced sales

Impact Type	Direct Effect	Indirect Effect	Induced Effect	Total Effect
Sales (Output)	-\$65,900,000	-\$27,300,000	-\$8,100,000	-\$101,300,000
A subset of sales:				
Value Added	-\$17,100,000	-\$13,000,000	-\$4,200,000	-\$34,300,000
A subset of value added:				
Labor Income	-\$13,900,000	-\$8,700,000	-\$1,700,000	-\$24,300,000
Employment	-150	-186	-61	-397

Summary

- Pinal County predominately livestock producing county, accounts for significant share of Arizona's cattle and milk sales
- Crop production centers around cotton and forage and feed crops for livestock industries
- Ranked in top 1% nationally for total agricultural sales
- While Pinal County economy has grown and diversified over past century, agriculture and related agribusiness industries still important contributors to regional economy

Summary

- Agricultural input manufacturing and agricultural (food and fiber) processing represents more than half of direct agribusiness sales contribution
 - On-farm agriculture: \$908 million
 - Other agribusiness: \$979 million
- Other industries in Pinal County supported by agriculture and agribusiness through indirect and induced effects

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