BREAKING GROUND

















BIENNIAL REPORT | 2016-2017





Tennessee has a rich agricultural history. For centuries, our farmers and foresters have found new and innovative ways to produce food and fiber across the three diverse grand divisions of our state. As farming methods have improved and advanced, I'm proud to see our Department of Agriculture continues to do the same.

I invite you to learn about how the Tennessee Department of Agriculture is breaking new ground. In this report, you will read about new state-of-the-art laboratory facilities, cutting-edge responses to natural disasters, and a particular focus to support new and existing agribusinesses.

Soon after I was elected Governor, I challenged the Department of Agriculture, the Tennessee Farm Bureau, and the UT Institute of Agriculture to lead in the development of a 10-year strategic plan for growing our agricultural and forest industry. The outcomes and discussion of that charge have led to some of the changes you will find in this report. We appreciate our industry partners for their assistance and collaboration in identifying ways to best serve the agricultural community.

The successes highlighted in these pages are a result of the involvement from stakeholders statewide and the talented Department employees who are dedicated to serving the citizens of Tennessee. We thank you for your support of these individuals, and we invite you to join us as we continue to be a leader in this industry.

Sincerely,

Bill Haslam

As I've traveled across Tennessee during my time as Commissioner of Agriculture, I've seen challenges from the Bronze Age being addressed with solutions from the Information Age. From collecting data with drones to utilizing precise GPS guidance systems for large-scale equipment, our farmers and foresters are leading the way with advancing technology. It is important that our Department of Agriculture has the same innovative mindset, and I believe the changes highlighted in the following pages show just that.

One of Governor Haslam's major focuses has been the health and prosperity of our rural communities. Agriculture is the number one industry in our state, but our leadership understands that there is still room to improve. We have been positioning ourselves to ensure that the agriculture industry is growing towards its full potential and providing opportunities that assist rural Tennessee.

This report shares new updates from the Department, as well as the latest farm production numbers for Tennessee. We appreciate USDA National Agriculture Statistics Service for partnering with us to provide this valuable information that helps us better understand what Tennessee agriculture looks like across the state.

The Department has been breaking new ground during an eventful time, complete with extraordinary challenges and milestone achievements. We're proud to tell these stories, and we plan to continue on this forward-thinking path to best serve Tennessee farmers, foresters, and consumers.

Sincerely,

Jai Templetón

Jai Tenploton

AGRICULTURAL ADVANCEMENT

Breaking New Ground | Building for the Future



When breaking new ground, planning for a strong and long-lasting structure is crucial. With that in mind, the Agricultural Advancement division realigned resources and staff to better address agribusiness growth and development.

The Agricultural Advancement division—formerly known as Market Development—has been restructured to become more strategic in efforts to facilitate agribusiness opportunities, particularly in distressed and at-risk counties in Tennessee.

Assistant Commissioner Ed Harlan leads the agribusiness development team, focusing on large-scale agriculture industry development and recruitment. These efforts are in partnership with the Tennessee Department of Economic and Community Development and local development officials.

Using existing resources, five Agribusiness Development Consultant positions have been established. Each concentrates on a particular area of emphasis, including two new

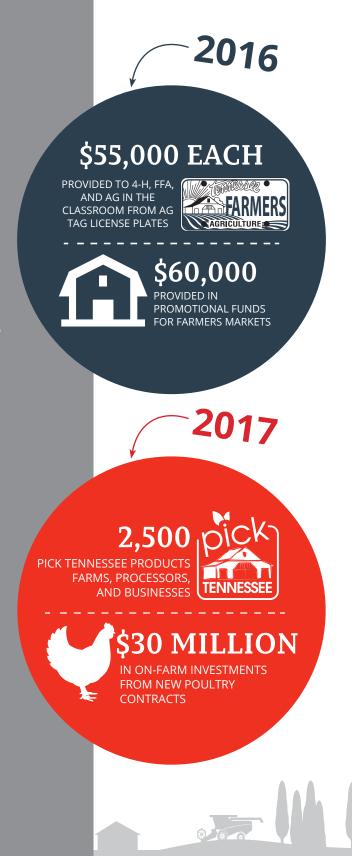
areas of food and forest industry development. The other three consultants specialize in livestock and meat processing, international marketing and trade, and farmdirect businesses.

The division has also incorporated the Agriculture Enterprise Fund (AEF), a grant program to provide assistance to new and expanding Tennessee agriculture and food businesses, particularly in rural counties. A product of the Governor's Rural Task Force, the AEF is an incentive program that supports Governor Haslam's priority of job creation and economic development by facilitating agricultural growth in Tennessee.

Many changes are taking place, but the Agricultural Advancement division will continue to house one of the most popular programs in the Department—Pick Tennessee Products. This program celebrated 30 years of promoting farm-direct and Tennessee-made products to consumers in 2016. With approximately 10,000 items listed, Pick Tennessee Products makes it simple to shop local.

"This division has been built with a solid foundation," Commissioner Templeton said. "Our staff will continue to grow, change, and identify new ways to benefit our rural communities, urban areas, and ultimately, all citizens of Tennessee."





TENNESSEE AGRICULTURAL ENHANCEMENT PROGRAM

Breaking New Ground | Investing in 6,000+ Farms



The drought of 2016 impacted nearly all farmers across Tennessee. Fortunately for Green Acres farm owner Denton Parkins, his strawberry fields didn't suffer, thanks to an irrigation system purchased with assistance from the Tennessee Agricultural Enhancement Program (TAEP).

Located in Milan, Green Acres produces ten acres of Chandler strawberries each year. Parkins has harvested strawberries on the family farm since 2000, and says that he breaks new ground every year with farm improvements through participation in TAEP.

"This program makes a big difference," said Parkins. "It really helps us add assets and efficiencies to the farm that would otherwise be cost prohibitive."

Parkins was not the only one to combat the most recent drought with TAEP assistance. As a result of the rain shortage back in 2007, hay storage facilities were added to the program. Since then, more than \$48 million has been invested in hay storage, with construction of 9,100 hay barns and barn additions that are especially valuable for

\$152 million has been provided to assist 51,830 projects

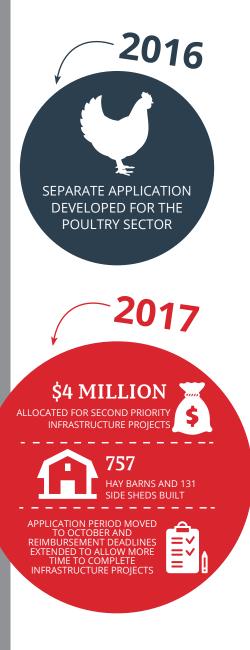
livestock farmers looking to more effectively manage their operations.

The program experienced a record number of applications in 2016 and 2017, receiving 6,007 applications and 5,642 applications, respectively. There were several changes that contributed to this success, including a more farming-friendly application deadline, program shifts, and utilizing new technology for improved record-keeping and faster response times.

The drought even impacted TAEP in 2017, as the department approved second priority infrastructure requests including hay storage, grain storage, working facility covers, and feed storage. To recover from the drought issues from the year before, clover seeders and no-till pasture drills were added to encourage pasture improvement.

Parkins is happy to see other farmers utilizing the cost share program and to see the program evolve to assist Tennessee agriculture as different challenges arise. For 2018, Parkins plans to utilize TAEP to further expand his irrigation system on Green Acres. "The benefits of the program are numerous because the projects that we put in will last for years," Parkins said. "These are long-term investments that ensure we have the proper tools to continue farming."







CONSUMER & INDUSTRY SERVICES

Breaking New Ground | On the Regulatory Front



The Consumer and Industry Services division (CIS) monitors a diverse range of materials, products, and services to assure quality, consumer protection, public safety, and a fair marketplace. Staff members in CIS managed many goals and projects in 2016 and 2017, ranging from incorporating new data management systems to stopping the spread of animal disease.

The division has placed particular emphasis on education before regulating. By building relationships with the industry's work force, the department inspectors focus on teaching best practices through open communication rather than just enforcing rules. This proactive approach to customer outreach is invaluable as the Department addresses invasive pests, food safety concerns, pesticide misuse, contaminated fuel, and more.

Division employees provided a successful diagnostic and surveillance response to a highly pathogenic avian influenza (HPAI) outbreak in spring of 2017. During that time, the C.E. Kord Animal Health Diagnostic Laboratory worked extended shifts while maintaining routine diagnostic testing for all of Tennessee's animal owners and industries. The outbreak was rapidly contained,

saving the poultry industry and Tennessee millions of dollars in potential losses and costs.

In September of 2016, the department broke ground on a new, state-of-the-art metrology laboratory at Ellington Agricultural Center to better serve the citizens of Tennessee. The weights and measures section of CIS that utilizes this facility is tasked with testing measuring devices such as fuel pumps, scales, and liquid propane gas meters; package check weighing for net quantity declaration accuracy; and the verification of accurate universal product codes at the retail level.

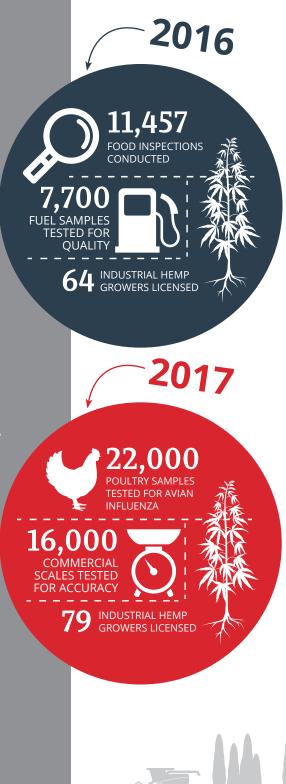
"I am grateful for the leadership of Governor Haslam, former Commissioner Johnson, and the state legislature for recognizing the value of this investment," Commissioner Jai Templeton said. "This new facility brings Tennessee back to fully recognized status with the National Institute of Standards and Technology, thus ensuring equity for the consumer and a level playing field for industry and commerce in Tennessee."

The expansive laboratory includes the most current equipment and testing capabilities to guarantee fairness in the marketplace. Businesses that depend upon certified scales, meters, and temperature measuring devices will significantly benefit from the services that are available at the laboratory.

The industrial hemp pilot program has also proven to be successful, demonstrated by the increase in grower applications received each year since the program began in 2015. As industrial hemp gathers more interest across the nation and as our growers continue to learn more about raising this crop, we are taking a progressive approach to make sure we're providing farmers in the state every opportunity to diversify and expand.

With new facilities and management systems, innovative team approaches to regulation, and key learning experiences from managing disease outbreaks, CIS plans to continue breaking new ground alongside Tennessee's number one industry for years to come.





FORESTRY

Breaking New Ground | On the Fireline



The 2016 fall wildfire season created challenges for the entire state of Tennessee. Severe drought over the course of several months led to dry conditions in nearly every forest. In an effort to minimize fire damage, Division of Forestry firefighters and staff members worked tirelessly and implemented technology at a new level.

Geographic Information Systems (GIS) is a tool designed to capture, store, analyze, manage, and present data through mapping. These systems allowed Division of Forestry staff to efficiently and accurately provide valuable information during the wildfire season, when it was needed most. Using aerial photography, geographical data layers, and on-the-ground updates, the GIS technology compiled data from multiple sources to provide firefighters on the fireline with information and visual updates on fire location, status, and condition. This resource was vital in strategizing to suppress and contain fires on a daily basis.

Location data regarding completed bulldozer lines, firelines, and uncontrolled fire areas aided in crafting maps to meet the needs of different firefighting tactics. In an emergency, it is critical to maintain a clear flow of information to the public and the images aided in that flow. Foresters provided the updated maps daily on social media and the Department's website to inform the public of the changing situation. Numerous media outlets broadcast these maps to further spread information that was critical to citizen safety.

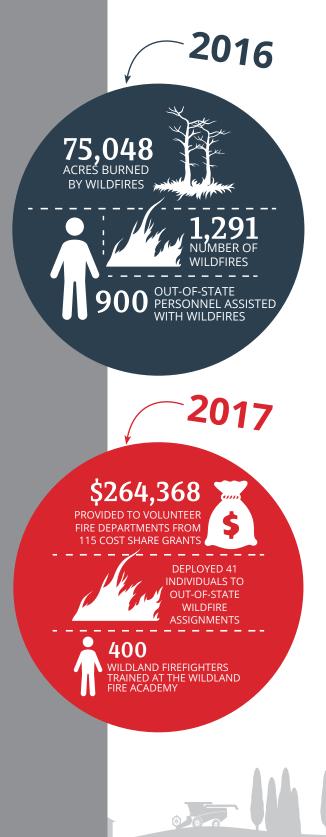
"Our firefighters need the most accurate and timely information when they are in the field," State Forester David Arnold said. "We are constantly looking for ways to supply them with immediate and precise material. GIS is a powerful tool for wildland fire suppression."

Partnership with other agencies and departments led to new uses of other technologies and tools. The USDA Forest Service employed infrared aerial photography to produce heat maps that gave a nightly indication of fire spread and the most intense hotspots. The maps also provided a more accurate estimation of fire location, perimeter, and size. With assistance from the Tennessee Bureau of Investigation and the Tennessee Civil Air Patrol, foresters also had access to aerial reconnaissance that supplied direct visuals of fire perimeters and the rate and direction of fire spread, which led to more efficient and effective operations planning.

The Army Air National Guard supplied specialized helicopter buckets -- known as Bambi buckets -- for precision water drops to suppress active fire perimeters, as well as reduce heat in the most intensely burning areas. Large air tankers from the USDA Forest Services dropped fire retardant to slow the spread of fires moving toward structures and communities. The drops also gave ground crews time to install fire lines and go on the offensive by fighting with fire – intentionally burning fuels inside the fireline to control rapidly spreading flames.

Moving forward, the Division of Forestry team is looking at ways to use GIS, GPS real-time tracking systems, smartphone field mapping, and other data collection systems to assist with fighting fire. The ultimate goal remains ensuring the safety of citizens, staff, and resources. "Whether it is with technology or training, we will always need to break new ground when fighting wildland fire," Arnold said. "Tools such as GIS, coupled with proficient preparation and strong partnerships, provide us the necessary means to get the job done and protect Tennessee's forests."





ADMINISTRATION & GRANTS

Breaking New Ground | Sowing to Recover



To be successful, farmers need favorable economic conditions, reliable public policy, and, often most importantly, good weather. Unfortunately, Tennessee farmers faced a significant challenge in 2016 with a drought that lasted through the majority of the year.

In an effort to assist those in counties most impacted by the lack of much-needed rain, the department determined a need for seed drills to aid in reseeding pastures and hayfields for drought recovery.

The department provided funding to the Tennessee Association of Conservation Districts, which solicited bids for the drills. Thirteen Soil Conservation Districts (SCD) purchased seed drills

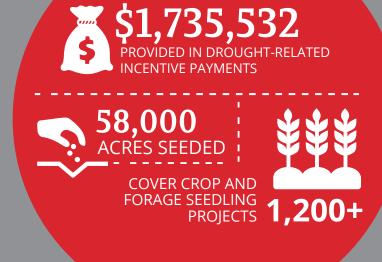
2016/2017

to be rented out to landowners. SCD offices serve landowners by providing assistance with the installation of conservation practices, which include preventing soil erosion, improving Tennessee's water quality, and promoting the stewardship of our natural resources. Because of their relationship with local farmers and their knowledge of conservation practices, the SCD offices served as ideal partners for the rental program.

Sequatchie County SCD received funds to help offset the drought's burden.
Assistance with fall seeding can create an economic impact beyond the producer.

"We had so many farmers and landowners who rented the seed drills during the drought," Sequatchie County SCD District Administrator Donna Knox said. "This opportunity was a wonderful way to support our local farmers and landowners and assist in seeding their lands to produce good forage. The program was a major success, and I hope TDA will offer similar opportunities in the future."

Staff members at the department will always aim to be a resource for farmers and landowners during times of need.

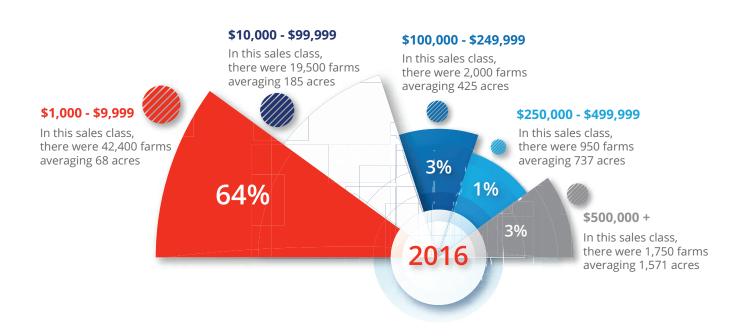


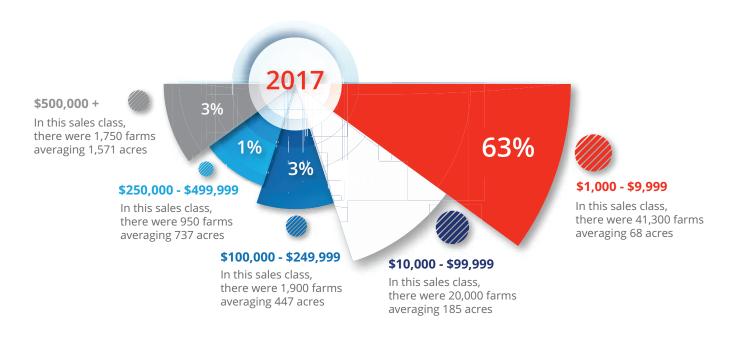
The seeds sown to recover from drought provided short-term solutions in 2017. Equally important, however, is the commitment to sustain farms for the long term by encouraging and incentivizing proper land management that conserves soil and improves water quality. These best practices will benefit Tennessee's farmers, waters, and lands for years to come.



STATE SUMMARY

Farms with annual sales of agricultural products of \$1,000 or more.





CASH RECEIPTS

\$610,911,000 \$537,227,000 \$73,684,000 \$118,852,000 \$541,090,000 \$443,871,000	\$651,207,000 \$566,248,000 \$84,959,000 \$130,032,000 \$578,427,000 \$494,496,000
\$537,227,000 \$73,684,000 \$118,852,000 \$541,090,000 \$443,871,000	\$566,248,000 \$84,959,000 \$130,032,000 \$578,427,000
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	\$494 496 000
¢76 F10 000	4151,150,000
\$76,518,000	\$68,391,000
\$2,351,000	\$1,039,000
\$18,350,000	\$14,501,000
\$45,872,000	\$45,753,000
\$1,316,725,000	\$1,405,419,000
\$121 049 000	\$93,982,000
	\$539,214,000
	\$268,148,000
	\$93,510,000
	\$712,648,000
\$34,497,000	\$23,701,000
\$356,759,000	\$357,704,000
\$1,976,098,000	\$2,088,908,000
	\$18,350,000 \$45,872,000 \$1,316,725,000 \$121,049,000 \$547,101,000 \$140,368,000 \$96,823,000 \$679,502,000 \$34,497,000 \$356,759,000

6.7% Increase

5.7% Increase

All Commodities

\$3,292,823,000

\$3,494,327,000

TENNESSEE'S STATE RANK

By commodity production in United States agriculture

<u> </u>	Number of Farms			
	Nullibel of Fallis	11	11	
	and in Farms	26	26	
	Average Farm Size	43	43	
,- ,	Гobacco, Burley	2	2	
Kentucky	Гobacco, Dark Air	2	2	
is #1 for all	Гobacco, Dark Fire	2	2	
tobacco	lay, Other	5	5	
	Cotton	7	9	
S	Soybeans	16	16	
	Corn, Grain	17	17	
	Winter Wheat	16	17	
	lay, Alfalfa	32	32	
^	Meat Goats	2	2	
	Cattle, Beef	13	12	
Texas is #1 for	Goats, Milk	17	16	
meat goats,	Broilers	15	15	
producing 680,000 more	Cattle, All	15	15	
head than -	Hogs, All	21	21	
Tennessee	Sheep, All	29	30	
	Cattle, Milk	30	30	

TENNESSEE'S PRODUCTION

By commodity in United States agriculture

TN Production By Commodity —	_ 2016	2017
Number of Farms	66,600	66,000
Land in Farms	10,800,000 acres	10,800,000 acres
Average Farm Size	162 acres	164 acres
Tobacco, Burley	16,200,000 lbs.	18,000,000 lbs.
Tobacco, Dark Air	2,340,000 lbs.	4,000,000 lbs.
Tobacco, Dark Fire	17,150,000 lbs.	21,000,000 lbs.
Hay, Other	3,870,000 tons	3,713,000 tons
Cotton	575,000 bales	732,000 bales
Soybeans	73,350,000 bu <i>¹</i>	83,000,000 bu.¹
Corn, Grain	125,330,000 bu.¹	121,410,000 bu. ¹
Winter Wheat	24,455,000 bu <i>:</i>	19,250,000 bu.¹
Hay, Alfalfa	54,000 tons	54,000 tons
Meat Goats	115,000 head	110,000 head
Cattle, Beef	886,000 head	909,000 head
Goats, Milk	7,000 head	7,000 head
Broilers	175,200,000 head	171,500,000 head
Cattle, All	1,830,000 head	1,830,000 head
Hogs, All	225,000 head	235,000 head
Sheep, All	48,000 head	46,000 head
Cattle, Milk	44,000 head	41,000 head

1/ Bushels

CROP PRODUCTION SUMMARY

2016 -

	Acres Harvested	Yield Per Acre	Production	Dollar Value
Corn ¹	830,000	151 bu. ⁵	125,330,000 bu. ⁵	\$458,708,000
Soybeans ¹	1,630,000	45 bu. ⁵	73,350,000 bu. ⁵	\$717,363,000
Wheat, Winter ^{1,2}	335,000	73 bu. ⁵	24,455,000 bu. ⁵	\$113,471,000
Cotton ³	250,000	1,104 lbs.	575,000 lbs.	\$191,820,000
Tobacco	20,000	1,767 lbs.	35,690,000 lbs.	\$83,993,000
Burley	12,000	1,350 lbs.	16,200,000 lbs.	\$31,752,000
Dark Fire-Cui	red 7,000	2,450 lbs.	17,150,000 lbs.	\$46,648,000
Dark Air-Cure	ed 1,200	1,950 lbs.	2,340,000 lbs.	\$5,593,000
Hay	1,815,000	2 tons	3,924,000 tons	\$437,850,000
 Alfalfa	15,000	4 tons	54,000 tons	\$12,150,000
Other, All	1,800,000	2 tons	3,870,000 tons	\$425,700,000
Tomatoes ⁴	3,600	335 cwt ⁶	1,206,000 cwt ⁶	(D)
Snap Beans ⁴	10,200	64 cwt ⁶	653,000 cwt ⁶	(D)

2017 -

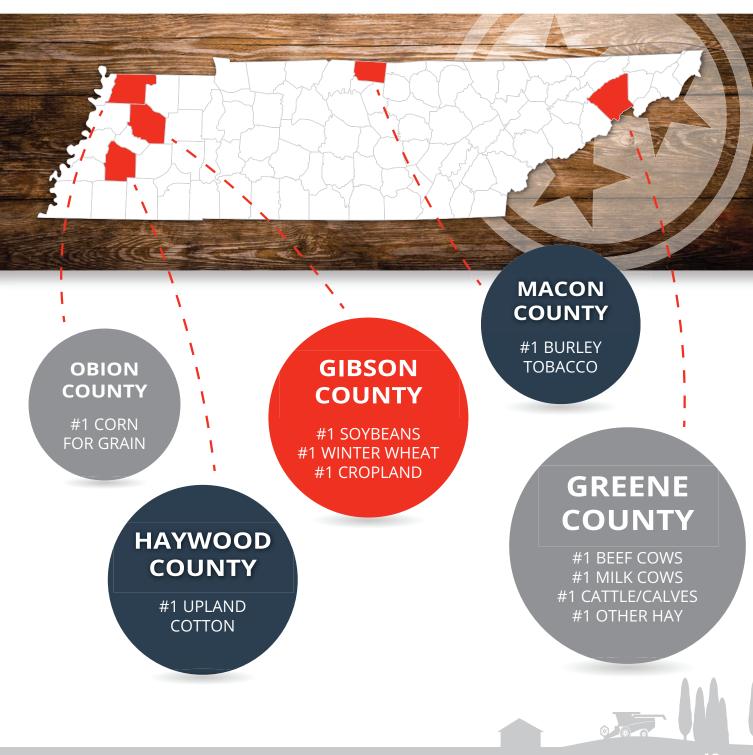
	Acres Harvested	Yield Per Acre	Production	Dollar Value
Corn ¹	710,000	171 bu. ⁵	121,410,000 bu. ⁵	\$431,006,000
Soybeans ¹	1,660,000	50 bu. ⁵	83,000,000 bu. ⁵	\$805,100,000
Wheat, Winter ^{1,2}	275,000	70 bu. ⁵	19,250,000 bu. ⁵	\$87,588,000
Cotton ³	340,000	1,033 lbs.	732,000 lbs.	\$234,418,000
Tobacco	21,100	2,038 lbs.	43,000,000 lbs.	\$103,190,000
Burley	12,000	1,500 lbs.	18,000,000 lbs.	\$36,180,000
Dark Fire-Cui	red 7,500	2,800 lbs.	21,000,000 lbs.	\$57,330,000
Dark Air-Cure	ed 1,600	2,500 lbs.	4,000,000 lbs.	\$9,680,000
Hay	1,715,000	2 tons	3,966,000 tons	\$457,612,000
Alfalfa	15,000	4 tons	56,000 tons	\$11,872,000
Other, All	1,700,000	2 tons	3,910,000 tons	\$445,740,000
Tomatoes ⁴	3,600	355 cwt ⁶	1,278,000 cwt ⁶	(D)
Snap Beans ⁴	9,100	61 cwt ⁶	555,000 cwt ⁶	(D)

^{1/} Acres harvested represents grain.

^{2/} Includes area planted in preceding fall. 3/ Production in 480-lb. net weight bales.

LEADING COUNTIES

For Agriculture Production in 2017



LIVESTOCK SUMMARY

By Class		
Per Head	2016	2017
All Cattle and Calves	1,830,000	1,830,000
Cows and Heifers That Have Calved	930,000	950,000
Beef Cows	886,000	909,000
Milk Cows	44,000	41,000
Calves Under 500 Pounds	415,000	410,000
Steers 500 Pounds and Over	145,000	135,000
Heifers 500 Pounds and Over	280,000	270,000
Beef Cow Replacements	160,000	145,000
Milk Cow Replacements	27,000	35,000
Other Heifers	93,000	90,000
Bulls 500 Pounds and Over	60,000	65,000
Calf Crop	840,000	850,000
Total Hogs	225,000	235,000
All Meat and Other Goats	115,000	110,000
All Milk Goats	7,200	7,000
All Sheep and Lambs ¹	48,000	46,000
Lamb Crop ²	36,000	35,000
Total Layers	1,671,000	1,775,000
Total Pullets	901,000	901,000
Other Chickens	161,000	170,000
All Chickens	2,733,000	2,846,000

^{1/} All sheep includes new crop lambs. New crop lambs are lambs born after September 30 of the previous year. 2/ Total for the year. Lamb crop defined as lambs marked, docked, or branded.

FEDERALLY INSPECTED PLANTS

and Head Slaughtered



HOG SUMMARY

HOG PRODUCTION

Adjustments made for inshipments and changes in inventories

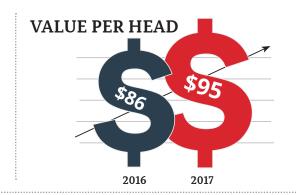
143 55 51 Million Pounds in 2016

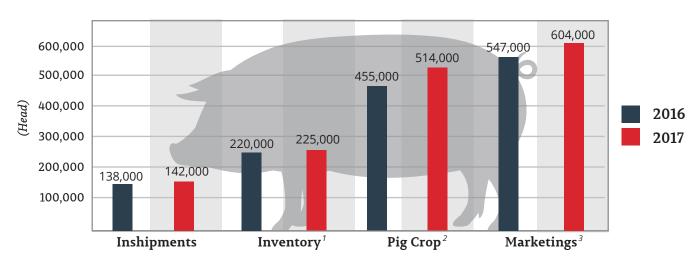
159 Hillion Pounds in 2017

HOG VALUE OF SALES

Includes allowance for higher average price of State inshipments and outshipments of feeder pigs. Receipts from marketings and sale of farm slaughter. Excludes interfarm in-state sales.





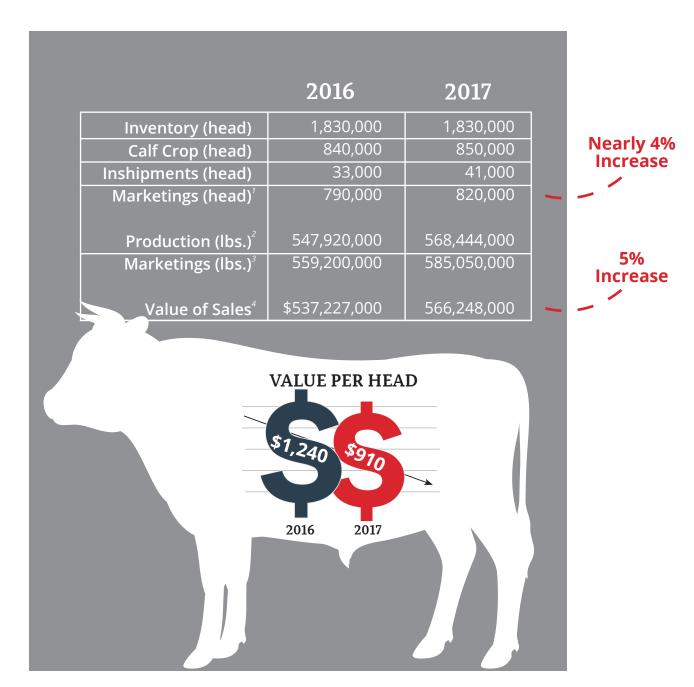


^{1/} Hogs and pigs inventory is as of December 1 of the previous year.

^{2/} From November 30 of the previous year to December 1.

^{3/} Includes custom slaughter for use on farms where produced and State outshipments, but excludes interfarm sales within the State.

CATTLE SUMMARY



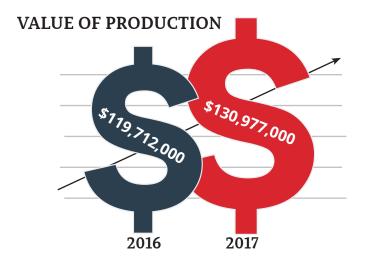
^{1/} Includes custom slaughter for use on farms where produced and State outshipments, but excludes interfarm sales within the State. 2/ Adjustments made for inshipments and changes in inventories.

^{3/} Excludes custom slaughter for use on farms where produced and interfarm sales within the State.

^{4/} Excludes interfarm in-state sales.

MILK PRODUCTION

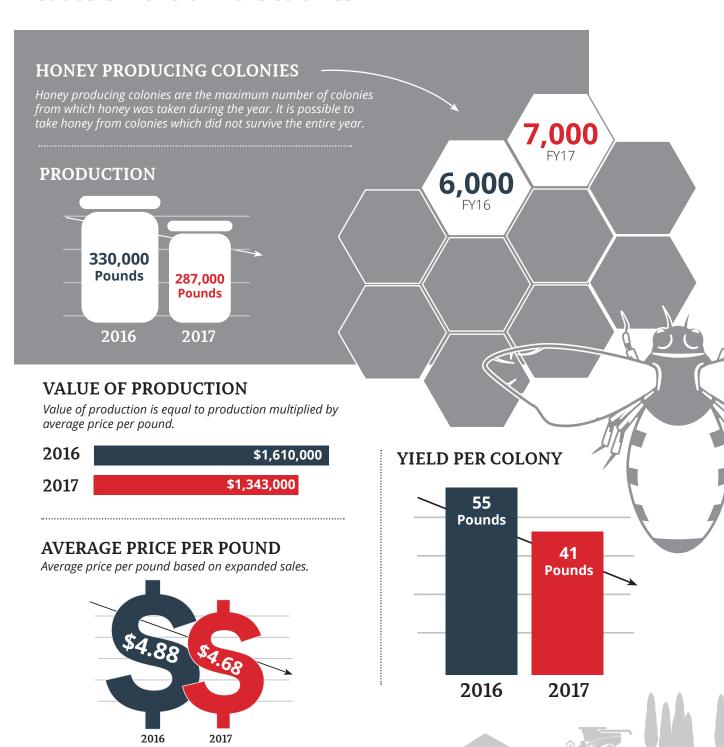
NUMBER OF MILK COWS ON FARMS Average number of cows on farms during year, excluding heifers not yet freshened. 44,000,000 Head 2016 2017 41,000,000 Head MILK PER COW & TOTAL MILK PRODUCTION Milk sold to plants and dealers as whole milk and equivalent amounts of milk for cream. Includes milk produced by dealers' own herds and small amounts sold directly to consumers. Includes milk produced by institutional herds. Excludes milk sucked by calves. Milk Per Cow Total Milk (lbs.) 17,325 Pounds 693 Million 16,571 **Pounds** 2017 2016 2017 2016





HONEY PRODUCTION

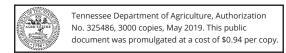
Producers with 5 or more colonies





Tennessee Department of Agriculture Ellington Agricultural Center 440 Hogan Road Nashville, TN 37220

(615) 837-5103 tn.gov/agriculture



Source: USDA's National Agricultural Statistics Service