Economic Forces Affecting Louisiana Agriculture Production through Space and Time

J.V. Westra
Professor
Department of Agricultural Economics and Agribusiness
101 Martin D. Woodin Hall
Louisiana State University AgCenter
Baton Rouge LA 70803
Email: jwestra@lsu.edu

H. Niu
Instructor
Department of Agricultural Economics and Agribusiness
101 Martin D. Woodin Hall
Louisiana State University AgCenter
Baton Rouge LA 70803
Email: hniu@agcenter.lsu.edu

J.M. Fannin
Associate Professor
Department of Agricultural Economics and Agribusiness
101 Martin D. Woodin Hall
Louisiana State University AgCenter
Baton Rouge LA 70803
Email: mfannin@agcenter.lsu.edu

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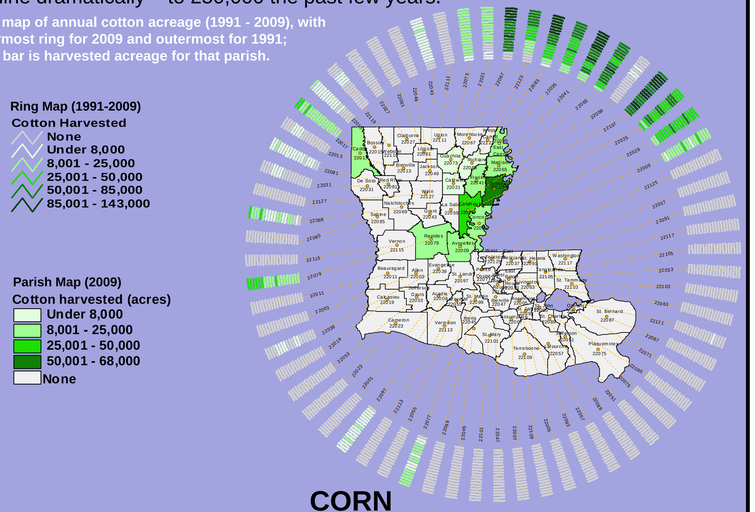
COTTON

Cultivation of cotton began around 1729 in Louisiana; mainly for home spinning and weaving. It was not until Eli Whitney invented the cotton gin in 1793 that cotton was produced in Louisiana as a cash crop. Within a century, cotton was grown on 48 million acres nationally and was the only major cash crop in the South. As recently as 10 years ago, cotton production occurred on nearly one million acres in Louisiana. Recently, damage from Hurricanes Gustav and Ike, increased competition from high corn prices and relatively weak cotton prices, caused acreage harvested for cotton to decline dramatically – to 250,000 the past few years.

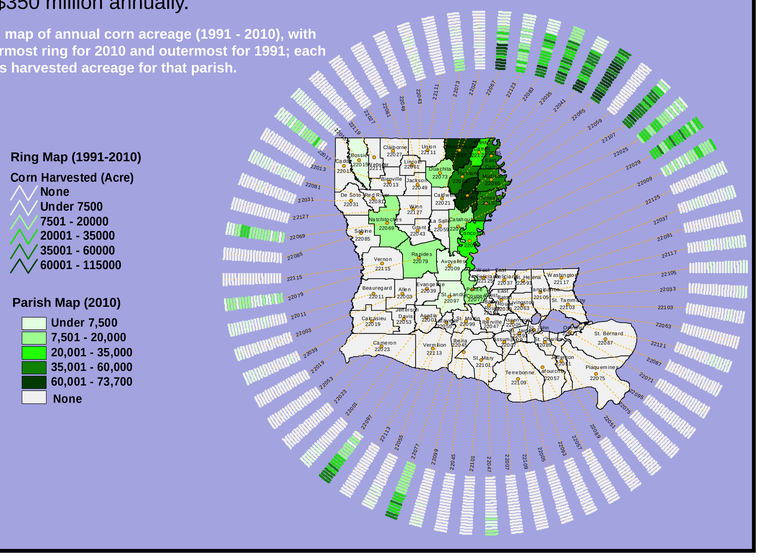
Ring map of annual cotton acreage (1991 - 2009), with innermost ring for 2009 and outermost for 1991; each bar is harvested acreage for that parish.



CORN

Cultivation of corn in Louisiana occurred throughout its history and traditionally occurs in rotation with cotton, wheat or soybeans in Delta parishes and central Louisiana. With higher-yielding improved varieties, and the significant increase in corn prices to record levels in the past few years, acreage planted to corn has more than doubled to 600,000 acres harvested statewide. Production is intensifying and expanding into new parishes as well. Total value of production statewide has tripled to $350 million annually.

Ring map of annual corn acreage (1991 - 2010), with innermost ring for 2010 and outermost for 1991; each bar is harvested acreage for that parish.



ABSTRACT

During the past two decades, economic forces have affected the distribution and intensity of crop production in Louisiana. Over time, rising costs of production inputs, primarily fuel, fertilizer and chemicals, have altered the acreage planted and harvested to specific crops across parishes. This, when combined with changes in crop prices, and producer expectations about prices at planting, have affected the mix of crops producers eventually harvest every year.

We develop a GIS-based "ring map" that can interpret the complex land-use patterns changing over two decades (from 1991 to 2009 or 2010). Our maps of Louisiana parishes show the most recent year crop data and the surrounded segmented circular rings that are parish–specific to display time series crop data.

We use four crops – cotton, corn, rice and soybeans, as examples to demonstrate how economic forces influence producers' decisions about crop mix. Given that these crops often substitute for one another in production, they present an opportunity to analyze and demonstrate the interaction of economic forces on land use through time.

We present ring maps to help illustrate how different economic forces interact to determine the land use and production associated with these four crops over two decades. In addition to economic forces, natural forces, specifically Hurricanes Katrina, Rita, Gustav and Ike, affected production of these four commodities. This presentation and analysis highlights the interaction of natural and economic forces with producers to affect land use decisions and the distribution of production across parishes in Louisiana through time.

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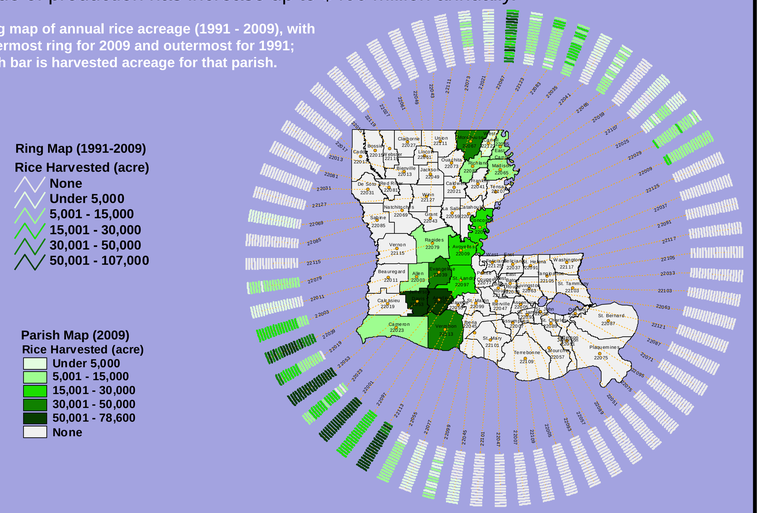
RICE

Rice production has taken place in Louisiana since its earliest days as a Spanish colony. However, it wasn't until introduction of improved varieties from Japan at the end of the 19th century that significant acreage harvested from rice occurred. Rice traditionally is produced in the coastal parishes and Delta parishes. Hurricanes Katrina and Rita caused significant damage to coastal fields with salt water intrusion five years ago and rice acreage was cut by one-third. After several years, rice production has rebounded to traditional levels of 500,000 acres annually and total value of production has increase up to $400 million annually.

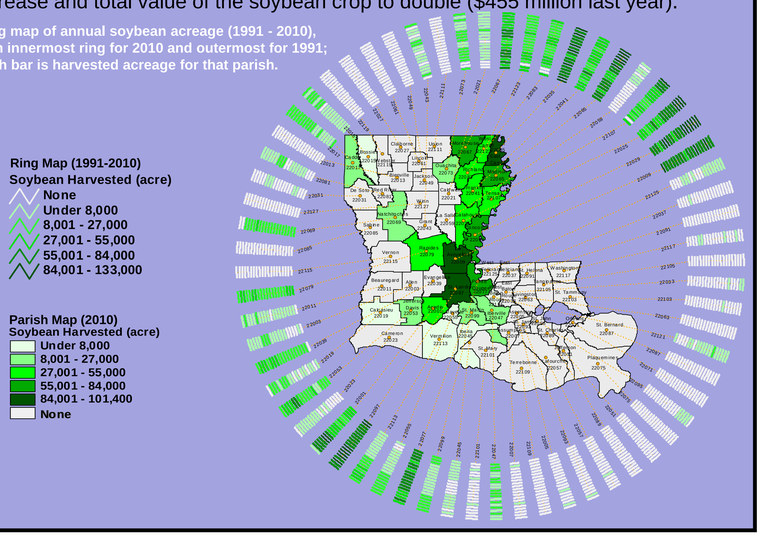
Ring map of annual rice acreage (1991 - 2009), with innermost ring for 2009 and outermost for 1991; each bar is harvested acreage for that parish.



SOYBEANS

Soybean production is a relatively recent crop in Louisiana – being introduced from Asia in the early 20th century. Historically, yields have been low and soybeans were grown primarily in rotation with rice, cotton or wheat. With relatively low cost for growing soybeans, producers readily adopted them to their farming operations and harvest one million acres annually. Recent increases in price have caused acreage to increase and total value of the soybean crop to double ($455 million last year).

Ring map of annual soybean acreage (1991 - 2010), with innermost ring for 2010 and outermost for 1991; each bar is harvested acreage for that parish.



REFERENCES/DATA SOURCES:

United States Department of Agriculture - National Agricultural Statistics Service. Quick Stats 1.0.
Accessed 15 April 2011: < http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats_1.0/index.asp >
Geo-visualizing data with ring-maps by Guilan Huang, Sergio Govoni, Jae Choi, David M. Hartley, James M. Wilson.

AUTHORS:

Department of Agricultural Economics and Agribusiness, Louisiana State University AgCenter, Baton Rouge LA