NASS *Highlights*

January 2015 • No. 2015-2

AGRICULTURAL RESOURCE MANAGEMENT SURVEY

U.S. Rice Industry

About this Publication

In 2013, USDA's National Agricultural Statistics Service (NASS) and Economic Research Service (ERS) conducted the Agricultural Resource Management Survey (ARMS) of the U.S. rice industry. During the Fall of 2013 and the Winter of 2014, trained enumerators conducted personal interviews with more than 1,000 rice growers in the 10 largest rice producing states. This publication includes highlights of their production practices, resource use, and finances in 2013. Earlier ARMS rice surveys covered outcomes during 2000 and 2006, and this publication compares recent results to those from earlier years.

Cost of Production

Table 1: Rice production costs per acre

	2006	2013
Purchased seed		
Production costs, nominal dollars	33.50	83.44
Production costs, 2013 dollars[1]	73.99	83.44
Commercial fertilizer		
Production costs, nominal dollars	59.64	130.25
Production costs, 2013 dollars[2]	107.74	130.25
Chemicals		
Production costs, nominal dollars	66.12	115.65
Production costs, 2013 dollars[3]	81.10	115.65

[1] 2006 seed costs are deflated to 2013 dollars using national rice seed prices (USDA, NASS, Agricultural Prices).
[2] 2006 commercial fertilizer costs are deflated to 2013 dollars using the national agricultural mixed fertilizer price index (USDA, NASS, Agricultural Prices).
[3] 2006 chemical costs are deflated to 2013 dollars using the national agricultural total chemical price index (USDA, NASS, Agricultural Prices).

Source: USDA

The costs of major inputs used in rice production—seed, fertilizers, and chemicals—all increased substantially from 2006 to 2013. Seed costs were up nearly $50 per acre, fertilizer costs were more than $70 per acre higher, and chemical costs were nearly $50 per acre higher. After adjusting for price changes in these inputs during 2006-13, seed costs were more than $9 per acre higher in 2013, reflecting changes in seeding rates and seeding methods, and new seed varieties. Both commercial fertilizer and chemical costs were much higher in 2013, than in 2006, even after price levels were adjusted, suggesting that more fertilizer and chemicals were applied to rice in 2013 than in 2006.

USDA **United States Department of Agriculture**
National Agricultural Statistics Service

www.nass.usda.gov
www.ers.usda.gov

Seed Use

Producers of long-grain rice have shifted to herbicide-tolerant (HT) varieties of seeds. The seeds, which have been developed conventionally without genetic engineering techniques, allow farmers to more effectively control certain weeds. The seeds were used on 64 percent of planted acres in 2013, up from 26 percent in 2006.

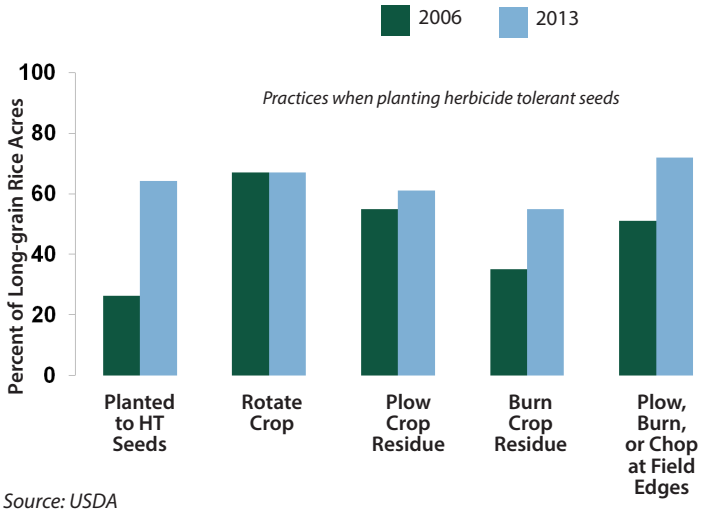
Table 2: Rice Seedings by Variety

	2006	2013
Acres HT	570,000	1,600,000
Acres non HT	1,600,000	890,000
% planted to HT rice in previous year	33	33
% planted to HT rice in each of two previous years	21	21

Source: USDA

Weeds can develop resistance to herbicides, and seed companies recommend that growers use a range of other practices to manage the emergence of resistance. One recommendation is to rotate rice with other crops. About one third of HT acres are still being planted in rice on rice. Companies also recommend other practices.

Figure 1: Rice production selected field practices

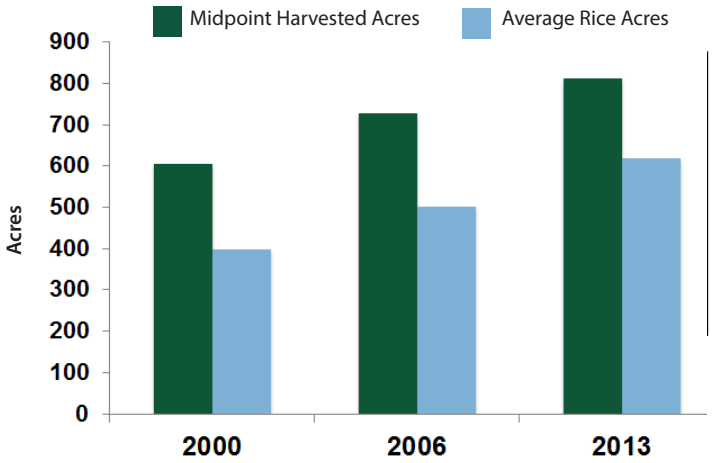


Source: USDA

Weeds can develop resistance to herbicides, but certain field practices can slow the development of resistance. For example, crop rotations can slow resistance, and two thirds of the acres planted to herbicide tolerant varieties were rotated into rice from other crops planted in the previous year. Resistant weed varieties can also be managed by plowing crop residues, burning residues, and plowing, burning, or chopping at the edges of fields; use of each of those practices increased—among farmers planting herbicide tolerant rice—between 2006 and 2013, although there are still farmers who do not adopt those practices.

Structural Change

Figure 2: Size of Rice Farms

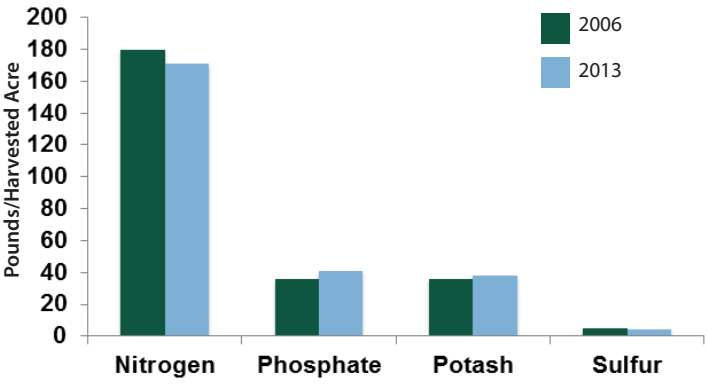


Source: USDA

Rice production shifted to larger farms during 2000 – 2013. The average amount of rice acres planted per farm increased from 398 in 2000 to 619 in 2013. Most farms combine rice with other commodities, and the average size of farms that planted rice rose from 2,180 acres in 2000 to 3,030 in 2013. While there are many small rice farms, most acreage is on large farms. The midpoint acreage for planted rice – the point at which half of all acreage is on smaller enterprises and half on larger, was 605 acres in 2000 and 812 by 2013.

Pesticide and Fertilizer Use

Figure 3: Fertilizer Use by Rice Growers



Source: USDA

Figure 4: Pesticide Use by Rice Growers

Source: USDA

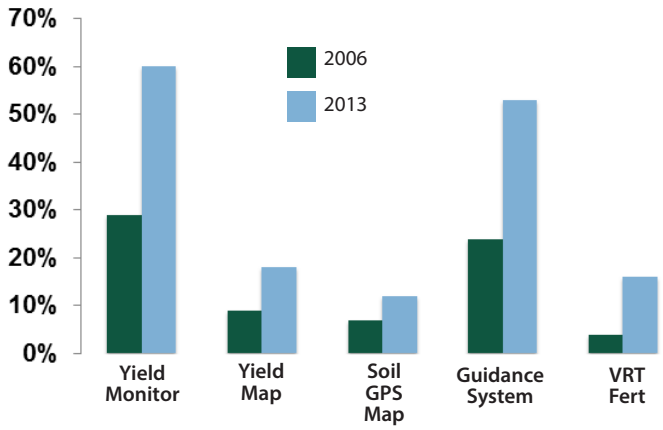
Average fertilizer application rates varied little between 2006 and 2013, as modest increases in phosphate and potash offset declines in nitrogen. Substantial increases in price-adjusted fertilizer expenditures may therefore reflect changes in how fertilizers were being applied.

Rice producers increased applications of herbicides between 2006 and 2013, from 2.7 to 3.0 pounds per acre, while average application rates for fungicides and insecticides fell.

Precision Agriculture

Precision agriculture refers to a set of practices that aim to take account of variations in nutrient needs, soil qualities, and pest pressures within fields, and that attempt to manage fields with those variations in mind. Some technologies have been rapidly adopted by rice farmers.

Figure 5: Percent of Rice Farms Adopting Precision Agriculture

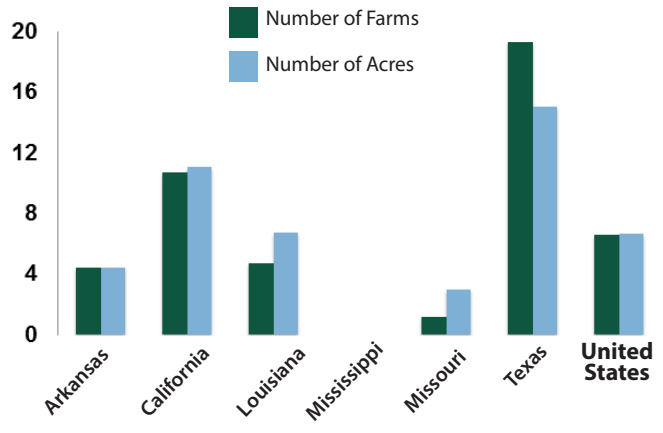


Source: USDA

Yield monitoring shows a large increase in use between 2006 and 2013, to 60 percent of farms. Monitors can identify variations in yields across a field, allowing farmers to adjust inputs and practices accordingly. Also gaining in popularity are auto-steer or guidance systems that reduce stress on operators, and also reduce errors in input application overlaps and seeding cut-off at the end rows. The cost savings from small adjustments to practices using these two technologies can also be accompanied by increases in yields.

Water Management

Figure 6: Percent of farms and acres reducing water usage due to lower water availability in 2013

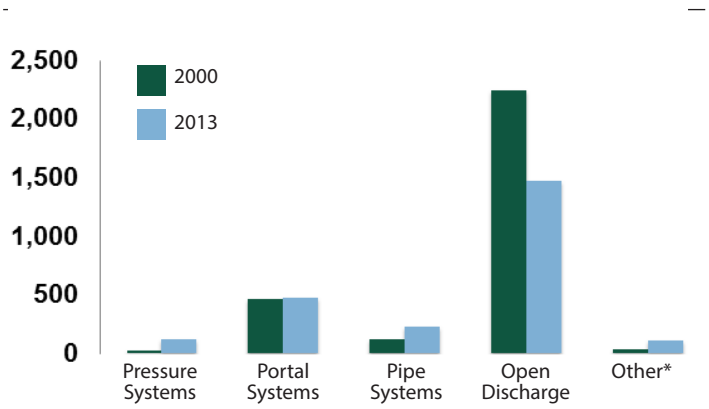


Source: USDA

www.nass.usda.gov
www.ers.usda.gov

Since rice is grown in flooded fields, the crop requires lots of water. Droughts in California and Texas put some rice producers under pressure to conserve water. The Texas rice growing region has suffered from droughts in the past several years leading Texas to impose water restrictions while California remained under voluntary guidelines. This may have partially caused the difference in the percentage of California and Texas rice producers who had to reduce their rice water usage in 2013. Note that the California drought significantly worsened in 2014, leading to a sharp drop in planted rice acres in that state.

Figure 7: Irrigation Systems Use on Rice Farms



** Other irrigation systems consists of siphon tubes, subirrigation, and other.*

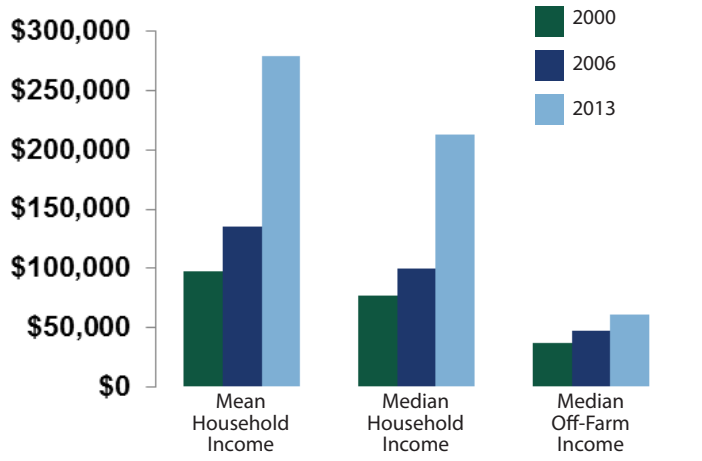
Source: USDA

Rice producers used an open discharge system to irrigate their rice fields on just over 60 percent of their rice acres in 2013 compared with 78 percent in 2000. This system generally requires the least amount of investment in irrigation equipment but it does require level land, and ditches or canals to be dug and maintained. It appears that rice producers may be inching away from open discharge systems. Portals were the second most common irrigation system used in rice production, accounting for nearly 20 percent of the 2013 rice acres. Pressure irrigation systems are not used often because these systems are not designed to flood a field with water and rice needs flooded fields.

Household Information

For most farm families, household income combines income earned off the farm with the net income earned from the farm. Off farm income may arise from off-farm jobs that household members work at, or from pensions, interest income or other sources unrelated to employment. In turn, the net income from the farm is the difference between the farm business' revenues and its expenses.

Figure 8: Rice Growers' Household Income



Source: USDA

The average (mean) household income among specialty rice producers was $278,985 in 2013, more than double the value of $134,780 in 2006 (Fig. 8). Specialty rice farms realize more than half of their farm revenues from rice.

While off-farm income is important to rice producers, with an average value of $60,730 in 2013, it grew very little over time, so most of the increase in household income reflected increased net income from farming. As in most occupations, farm household incomes are quite skewed, so that a small number of households with very high incomes raise the mean. However, the median household income among specialty rice was $212,805 in 2013, also a large jump from the 2006 median of $99,708.

Of course, prices rose between 2006 and 2013, but the increase in consumer prices (the Consumer Price Index rose by 23 percent) was well below the increase in mean and median household incomes, so that the inflation-adjusted incomes of rice producers rose considerably. In turn, higher real incomes reflect the fact that 2013 was a good year for rice producers, with revenues well in excess of expenses, as well as the shift of production to larger farms, which tend to have higher farm and household incomes.