Viewpoints and Changing Practices of Arkansas Rice Farmers

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When people ask me what I do, I tell them I'm just a farmer. Sometimes they ask, "Well, why do you say that?" Most of us who farm—I would say 99%—do so because that's what we want to do. We don't want to deal with all the problems of regulations, of politics or of subsidies. We want to till the soil and plant a crop and watch it grow and harvest it. But, we've come far from that today. I found the following words this past week in a magazine:

> *Agriculture is the foundation and cornerstone of civilization. Without a dependable and safe food system there could never have been the opportunity for any other professions or pursuits to evolve or to even flourish. We seem to have, as a society, forgotten this. Consecutive generations of my family have farmed this country since before its founding. We are strong-willed—a nice way of saying stubborn—independent, resourceful people… These pioneers were at the same time establishing communities as they created their farms.*

I wish I had the ability to have written that. Where we fail in agriculture is we don't have a spokesman who is nationally accepted and listened to, to tell the story of agriculture. It was written by an Arkansas man who lives in Little Rock, P. Allen Smith. He is on television quite a bit with shows about gardening and lifestyle.

I grew up on the Grand Prairie of Arkansas, which is located between the White and Arkansas Rivers. It was a tall-grass prairie. My father said that, when he was a small boy—he was born in 1907—in late spring when the prairie grass was fully grown, a man riding across it on a horse could be seen only from his shoulders up. The cash crop was hay. It was shipped by rail from points in Stuttgart and other sidings along the St. Louis-Southwestern Railroad known as the cotton belt.

Rice Arrives in Arkansas

In the 1900s, rice was planted in the Carlisle area, north of Stuttgart on the western side of the Grand Prairie. It was successful. My grandfather raised the first field of rice on our family farm in 1908, and it has been part of the Grand Prairie ever since. It is a good crop for the Grand Prairie because of two things. A good supply of water is available from the Alluvial Aquifer, which ranges from 130 to 180 feet deep. And a hard pan holds the floodwater by preventing percolation.

Cultivation of rice slowly but surely grew from that point into the 1950s, becoming increasingly important. The main sources of income were rice as a cash crop and cattle. They raised rice almost continuously. They would pasture or summer kill the field and about every third year the field was raised in rice. Water tables held up fairly well. The Grand Prairie, where rice-production was concentrated, starts just below Des Arc, Arkansas, and runs 70 miles to the south-east between the two rivers, to Gillett, Arkansas, with a maximum width of 30 miles.

In the 1950s and 1960s, many new wells were sunk. Recharge for the Alluvial Aquifer comes mainly from the White River, and, in the south, from the Arkansas River. The water table began to drop slowly as more water was taken out each year to irrigate crops. Around 1958, cattle prices fell and beef production decreased. Soybeans were introduced onto the prairie as a rotational crop. Tyson Foods built a processing plant in 1960 in Stuttgart, and soybeans became an alternative crop in rotation with rice. Soybean was the minor crop, cultivated for extra income without irrigation.

Management

At that time, rice was normally planted from April 10 to May 20 and was harvested from September 20 to October 20, a 150-day growing season. It was estimated then that rice used about 36 acre inches of water. I would say that it was probably closer to 40 acre inches at that time, because water did two things. It kept the aquatic crop alive and it helped prevent infestation of grassy weeds. Grass-only herbicides were not available. We had herbicides for broadleaf weeds, albeit not many, so the fields were flooded when the weeds were small but then because of the alkaline condition of the Alluvial water the soil pH kept rising and the rice would get sickly; we'd drain and reflood and drain and reflood until the rice became sufficiently well developed to withstand the alkaline conditions. Then came economic considerations; there was a desire to irrigate not only rice but also soybean to increase yields. Agriculture is kind of a reverse business. We farmers buy everything at retail and sell it at wholesale. And we are takers of prices, not staters of prices. In agriculture, as supply increases and prices drop—a normal economic condition—to survive we must produce more at a lower price.

So, the demand for water also applied to soybean, which started to pull heavily on the aquifer. A couple of things happened. Some in the late 1950s and early 1960s began putting down deep wells into the Sparta Aquifer, which is anywhere between 450 to 750 feet deep. Memphis, Tennessee, Greenville, Mississippi, and most of the larger towns in the delta get their drinking water from the Sparta Aquifer. At the same time, a balancing influence came in: research at a rice experiment station in Stuttgart started developing

fast-maturing varieties. These are still planted from April 10 to May 20, but they are harvested from August 20 to about September 15. With the growing season shorter by 30 days, the amount of water used is reduced, and we have herbicides now to take care of the grass problem. But we still have water-related issues. Not only does the Alluvial Aquifer keep dropping; so does the Sparta Aquifer.

Addressing Aquifer Depletion

In 1972, we farmers were encouraged to grow rice from fence row to fence row. Production increased and, in some years in Arkansas, 1.8 million acres were devoted to rice production with 48–52% of all the rice raised in the United States. More wells were poked into the ground, some between the Grand Prairie and the rivers, cutting off aquifer recharge. The Alluvial Aquifer, instead of being 80 feet deep when I was a young man, now is closer to 120 feet deep. The Sparta Aquifer is being similarly depleted.

In the late 1950s, exploitation of surface water began. Large reservoirs were built, not only for irrigation, but also for commercial hunting. Although that has been helpful, aquifer depletion is still occurring. Underground pipe linkages were started in the late 1950s and early 1960s, first with transite pipe, 10, 12 and as large as 15 inches in diameter. Now most of that pipe is PVC, at 12 inches in diameter. On my family farm, which encompasses 1,160 acres, we have installed 18,000 feet of underground pipe since 1961. It closes open canals where evaporation is high, where seepage and leakage from those canals is severe, and where continuous maintenance is needed. It takes irrigation water underground into a closed system with conservation benefits.

We now use Poly-pipe, which is rolled out into the field. Holes provide row irrigation. It was first used on the prairie mainly for irrigating soybean and corn, but now, through research at our experiment station, they have discovered that if you roll Poly-pipe down the hill through a rice field across the levees, you poke multiple holes at each levee and flood the entire field at one time, evaporation and other water losses are reduced by maybe 15%.

We use landforming, probably more so off the prairie than on the prairie. The problem with landforming on the Grand Prairie is that the topsoil, at best, averages 4 inches thick. To level the field, the top soil is removed and stockpiled and then reapplied after leveling; if the soil is not replaced, cropping is impossible. In the other areas of Arkansas in the Delta where rice is now raised, top soils are 3- to 4-feet deep, so they just cut it level. A zero grade requires less water to achieve flooding.

In the past 10 years, we have developed tailwater recovery systems, which are installed at the bottom ends of large fields' drainage areas; irrigation water runs from fields into pit reservoirs. Each is basically a contour hole in the ground and the water is pumped back to the top of the field and reused.

We now have row rice, which is planted like soybeans. Poly-pipe is laid between the rows, as with soybeans. To hold the cost down, at the bottom of the field a tailwater recovery trench is installed so that excess water can be recirculated.

Center-pivot irrigation is being found to be a viable option for some situations. The rice is watered exactly like corn or soybeans. Surge valves haven't been used much in Arkansas,

but they are another option for water conservation. And we have cell-phone applications; without driving to a well to shut it off or start it up, it can be done by telephone.

All of these technologies can help improve water sustainability. However, not all of these approaches work for every farmer. Our goal is to bring understanding to the farmer of what these technologies can contribute to their individual farming operations.

Priorities

Household

What water issues do farmers face? They are the same as those faced by everyone. The first water issue we face is human consumption. I don't know if many farmers would admit it, but they understand that the number-one need for water in this country is for drinking, cooking, bathing, and general household use. I don't include watering the lawn in that. Common Bermuda grass will survive the worst drought and green up after a half inch of rain. So, I don't consider lawn irrigation to be important. But, certainly, human consumption is the number-one water-use issue we face in this country.

Industry

In Arkansas, water is an industrial issue. We have a huge paper-mill industry in Pine Bluff that takes an enormous amount of water every day, every night, from numerous deep wells in the Sparta Aquifer. It's treated and released and goes downstream. Farmers who operate below Pine Bluff are happy because they have a continuous source of surface water for irrigation. But it is damaging to the Sparta Aquifer. Since the establishment of the Arkansas River navigation system, the level of the Arkansas River is held constant at all times. Water taken from the Arkansas River for industrial use is purified, and reinjected into the river with very little loss.

Agriculture

The third issue we have, of course, is agricultural water. In my personal opinion I think it should be number two, not industry, but I'm not paid by industry; other people have other views. Our biggest issue in agricultural water in Arkansas right now is too much and too little. Farms 20 miles from where I live have been totally inundated by flooding from the White River. This year, those same farms are extremely dry. Water in agricultural situations is hard to plan for. The average annual state rainfall is about 48 inches, an abundant amount. Much of it runs off into the Mississippi River and needs to be captured and stored. We are slowly developing that capability.

To grow crops and feed this country, water is a critical issue. We have to convince farmers who have abundant water to use water-saving devices. Some farmers with access to abundant ground- and surface-water are less than frugal. If you have plenty of disposable income you are comfortable with buying most anything, whereas if your disposable income is limited you are more careful with how you spend it. We, as farmers, need to make this point to agricultural producers in Arkansas: just because you have abundant water doesn't mean you are entitled to use it wastefully. Our challenge as agricultural leaders is to bring this knowledge to the farming community, to do it from a grass-roots

level, not from a government level—to impart understanding of what we can do to raise the same crops with less water and less wastefulness. It is key for continued success in row-crop production in Arkansas.

RAY VESTER is a fourth-generation rice farmer on the Grand Prairie of Arkansas near the town of Stuttgart. He attended the University of Arkansas, Fayetteville, majoring in accounting. He is active in other aspects of agriculture, including as a member of the USA Rice Federation as chairman of their environmental regulatory subcommittee. He also serves on the Federation biotechnology task force and the sustainability task force. Recently, he completed a two-year term on the Farm Ranch and Rural Community committee, which advises the EPA. He has served the state of Arkansas on the Arkansas State Plant Board for the past 14 years as rice-producer representative. Mr.Vester is also a member of the Arkansas Department of Agriculture advisory board and is active in his community. He has served for 24 years on the board of directors of Producers Rice Mill, Inc., a farmer-owned cooperative comprising 2,500 members. And he is a member of the board of directors of the Farmers and Merchants Bank, a community bank serving the Grand Prairie. He is married to Debra, has two grown children, a daughter Jennifer and a son Cody, and two grandsons.