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Christian County Agricultural Impact on Global Agriculture  
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By Jerry Gilliam

Agriculture has always been the life blood of Christian County's economy. This paper will examine the impact Christian County has had on the agricultural worldwide, it's contribution to the world stage, and its overall positive value it brings to producing the worlds food. But first lets evaluate the history of the industrial revolution and how agriculture played a valuable part in allowing the advancements in the last 150 years to occur.

The first question is did the industrial revolution allow for advancements to be made in the agricultural revolution or did the agricultural revolution allow for the advancement to spark the industrial revolution. The Industrial Revolution occurred in Great Britain, continental Europe, and the United States, in the period from about 1760 to sometime between 1820 and 1840. The Industrial Revolution saw significant growth in the middle classes by having the need for an increased workforce.

The **Agricultural Revolution** of the 18th century created a favorable climate for industrialization. With transitions from hunters and gathers to concentrated farming practices occurring, the opportunity allowed for more people to be available for work.

Also, by increasing food production, the American population could be fed at lower prices with less effort than ever before. The surplus of food allowed for lower food cost thus allowing for disposable incomes to rise. America saw an increase of population and the rural urban <sup>divide</sup> began. The less need for farmers from rural areas in search of wage-labor created a ready pool of workers for the new industries.

### **Technological Changes**

Iron production changed in the early 18th century, a new method of smelting iron by using coke or 'courke' was introduced. Since coke could heat iron more quickly than charcoal, production rates increased. This iron was instrumental in creating industrial machinery and railroad lines.

Without important technological changes, the first Industrial Revolution would not have been possible. In the 18th century, Britain's cotton industry charged ahead of many other countries. With James Hargreaves' invention of the spinning Jenny in 1764, yarn could be produced in greater quantities.

In 1787, Edmund Cartwright's power loom revolutionized the speed of cloth weaving.

In the 1760s, the steam engine (developed by James Watt) further transformed the cotton industry.

Unlike early devices powered exclusively by water, these steam engines were powered by coal. This meant that factories no longer needed to be located next to sources of water. The steam engine also made farming more efficient with threshers allowing for grain separation of crops in the field. Steam innovation allowed for both the industrial and agricultural advancement to “plow new ground” as efficiency began to impact the economy and overall production.

Application of machinery to farming improved significantly and continued to exponentially advance the science and technology of both agriculture and industrial sectors. In 1840 Cyrus McCormick performed a miracle by cutting 6 acres a day with the reaper, the curious machine he had been developing for nearly 10 years. Foreseeing the demand, he headed west to the young prairie town of Chicago, where he set up a factory -- and by 1860 sold a quarter of a million reapers.

Other farm machines were developed in rapid succession: the automatic wire binder, the threshing machine and the reaper-thresher or combine. Mechanical planters, cutters, huskers and shellers appeared, as did cream separators, manure spreaders, potato planters, hay driers, poultry incubators and a hundred other inventions.

Science quickly became more important than mechanical innovation in agriculture. The Morrill Land Grant College Act of 1862 allotted public land to each state for the establishment of agricultural and industrial colleges. These were to serve both as educational institutions and as centers for research in scientific farming. Congress subsequently appropriated funds for the creation of agricultural experiment stations throughout the country and also granted funds directly to the Department of Agriculture for research purposes. By the beginning of the new century, scientists throughout the United States were at work on a wide variety of agricultural projects. These land grant institutions still exist today. In 1914, the Smith Lever act was adapted which officially created the extension services associated with the land grant colleges. The purpose of this extension service was to disseminate information, technology, and “best practices from the land grant researchers into the hands of the farmers and rural communities. By providing this form of education, farmers began to hone their skills in many agricultural practices. As a result, many growers began to see new ways of creating their own efficiencies, and increased production practices. More about this later.

By the 20<sup>th</sup> century, agriculture was growing significantly. John Deere invented the moldboard plow with new material that helped mold the industrial revolution. Iron ore and its newfound properties allowed for efficient plowing to occur. This along with the McCormick tractor through the invention of the combustible engine allowed for the reduction in farm labor. This provided additional opportunity for Americans to develop urban areas and work off the farm in factories inside cities. However, by the 1930's with an abundant amount of food and a large portion of the mid west being “plowed for production agriculture, devastation hit. As a result of the new innovations and the increased amount of land being farmed drought hit the west creating the infamous “dust bowl”. Some interesting facts derives from the History Channel identified many unique situations about the dust bowl.

While “black blizzards” constantly menaced Plains states in the 1930s, a massive dust storm 2 miles high traveled 2,000 miles before hitting the East Coast on May 11, 1934. For five hours, a fog of prairie dirt enshrouded landmarks such as the Statue of Liberty and the U.S. Capitol, inside which lawmakers were debating a soil conservation bill. For East Coasters, the storm was a mere inconvenience—“Housewives kept busy,” read a New York Times subhead—compared to the tribulations endured by Dust Bowl residents.

Beginning with World War I, American wheat harvests flowed like gold as demand boomed. Lured by record wheat prices and promises by land developers that “rain follows the plow,” farmers powered by new gasoline tractors over-plowed and over-grazed the southern Plains. When the drought and Great Depression hit in the early 1930s, the wheat market collapsed. Once the oceans of wheat, which replaced the sea of prairie grass that anchored the topsoil into place, dried up, the land was defenseless against the winds that blasted the Plains.

If the dust storms that turned daylight to darkness weren’t apocalyptic enough, the jackrabbits and grasshopper invades made for future good wise tails.. To combat the hundreds of thousands of jackrabbits that overran the Dust Bowl states in 1935, some towns staged “rabbit drives” in which townsmen corralled the jackrabbits in pens and smashed them to death with clubs and baseball bats. Thick clouds of grasshoppers—as large as 23,000 insects per acre, according to one estimate—also swept over farms and consumed everything in their wakes. “What the sun left, the grasshoppers took,” President Franklin D. Roosevelt said during a fireside chat. The National Guard was called out to crush grasshoppers with tractors and burn infested fields, while the Civilian Conservation Corps spread an insecticide of arsenic and molasses.

There were few things desperate Dust Bowl residents didn’t try to make it rain. Some followed the old folklore of killing snakes and hanging them belly-up on fences. Others tried shock and awe. Farmers in one Texas town paid a self-professed rainmaker \$500 to fire off rockets carrying an explosive mixture of dynamite and nitroglycerine to induce showers. Corporations also touted their products to the federal government as possible solutions. Sisalkraft proposed covering the farms with waterproof paper, while a New Jersey asphalt company suggested simply paving the Plains.

Although the Dust Bowl was over with by the 1960s, the thought of future droughts and the opportunity of a repeat dust bowl along with the concern of soil erosion from water and wind allowed for innovation in improved ag practices. With the invention of chemical herbicides, the need for reduced tillage became a sought practice. In 1962, two brothers from Christian County, Harry and Lawrence Young were among the first farmers to use mechanized, no till farming techniques. They collaborated with University of Kentucky’s College of Agriculture, Shirley Phillips, to develop a planter capable of planting crops in undisturbed soil. This allowed for reduced erosion that is contributed from water and wind, which caused the dust bowl. The

challenge of no till was combatted with the new chemical technologies in the form of herbicides for weed controls. As this technology advanced to include selective herbicides (herbicides that only kill weeds and not the crops), no till farming became a worldwide practice. Conservation practices and incentives were giving to growers that produced no till crops. Thanks to this Christian County innovation, we saw an increase in production locally by adding double crop soybeans after the wheat is harvested in the summer. This two crop in one year rotation mitigated risk, increased gross farm income, and provided another rotational tool for farmers.

No till farming grew in popularity and acreage over the next several years. While No-till's primary reason to be developed was to control erosion, additional benefits quickly emerged. Some of those advantages included soil moisture retention as a result of "residue from previous crop" protecting the soil from sun and evaporation, reduced fuel usage; less need for higher horsepower tractors to pull tillage equipment, more timely field work as rain played less of an impact as to when you could return to field, soil microbial activity improved causing natural tilling of the soil, and less carbon emission. These advantages did have to overcome some negative impacts no till created. These include; soil temperature as a result of less sunlight penetration, disease pressure as residual crop could be a carrier to the new crop, compaction at the seed bed level, and seedling emergence. However, thanks to another local innovator, a solution was created. In the early 80's, Howard Martin of Todd County developed a planter attachment that managed the residue from the previous crop. Martin called the invention a row cleaner as it would attach to the front of each row unit on a planter and push the residue to the side. This allowed for a better seed bed and placement. This also allowed for sunlight to warm up soil in the furrow and push the potential disease carrying residue to the side. Today most all of no till operations use this invention and Martin's factory is operational in Todd County today.

In conclusion, would adequate evidence be given to suggest that the advancement in agriculture is what led to the innovation in industrial manufacturing by allowing for a more capable workforce to participate in manufacturing? Or would the industrial revolution in manufacturing also create innovations toward agriculture. I would conclude that it was a combination of the perfect storm that allowed for this cultural shift to occur. I would also conclude that our area has allowed for newer agricultural practices to occur through our ingenious agricultural pioneers.

Harry Youngs family still farms in Christian County today. John (Harry's son) and Alex (John's son) still demonstrate outstanding excellence in farming today. Mr. Martin and his family also still farm as well as operate a manufacturing facility in Todd County today, Martin Industries. Maybe these innovations in agriculture is a main reason our area is recognized nationally as one of the agricultural mecca of America. This history and our rich history of dark-fired tobacco (which is only grown in a few counties in western KY and TN) demonstrates the inherited drive of success and innovation we possess in our area.

