

August 2014

Value of Irrigation to the Southwest Michigan Economy

Irrigation is important to crop production in southwest Michigan. In crops ranging from Commercial Corn to Zucchini, irrigation allows producers to plant their crops with confidence because they can manage drought stress to ensure yield, quality and productivity of the crops they raise. This is particularly important to the high input crops, where the investment in production may be as high as \$9000 per acre or more. Unlike other places in the US where irrigation provides almost all of the water needed to raise the crop, irrigation in southwest Michigan is used to supplement the natural rainfall.

In the 2012 Census of Agriculture, Michigan was listed as having 592,000 acres under irrigation. The 8 counties included in this report had approximately 352,00 acres under irrigation, or roughly 60% of the states irrigated acreage. Of this total, around 30% of the acres produce hybrid seed corn, 12% of these acres are used to produce irrigated vegetables. An additional 5% accounts for irrigated blueberry production. The remaining 52% of the acreage is primarily used to irrigate commercial corn and soybeans. However, there are other vegetable and ornamental crops that are included in this value.

This publication highlights the economic value provided to the region by the production of high value irrigated crops. Acreage of production is based on USDA NASS acreage estimates and personal communications with contract production companies and key growers. Economic values are based on 2014 commodity prices and market year averages.



Seed Corn

In a region that is known for specialty crop production, seed corn is the most important crop. St. Joseph County is home to the two largest seed corn processing plants in the world, operated by the two largest seed corn companies, DeKalb and Pioneer. Other seed corn companies operating in the area are Grow-Alliance, Remington Hybrids North, Select Seeds and Mendon Seed Corn Growers.

In combination, these seed corn companies raise a staggering 150,000 acres of hybrid seed corn in southern Michigan and Northern Indiana.

The value of the seed produced by these companies in the region is estimated to be worth \$1.023 Billion in 2014.

Farm Gate value of the industry is expected to be over \$100 million in 2014, even with lower corn prices.

Hybrid Seed corn is produced in southwest Michigan in St. Joseph, Branch, Kalamazoo, Cass, and Van Buren Counties. A small production area is grown for Pioneer in the Lakeview area in Montcalm county as well.

Monsanto Employs around 75 full time, up to 1200 seasonal and 300 part time employees during harvest.

Pioneer employs around 60 full time employees, up to 2000 seasonal for de-tasseling and 300 harvest part time employees.

Direct employment is only part of the story. Many growers serve as private contractors providing services such as mechanical de-tasseling, male row destruction, harvesting and hauling for the seed companies. Since these activities are independent of the production contract, they generate additional revenues each year from the companies.

In addition to direct employment by the seed companies, many other businesses have located in St. Joseph, Branch and Kalamazoo Counties that support the industry. Green-Mark Equipment, one of the largest John Deere Dealerships in the country, is located in Three Rivers and Howe Indiana. Specialty Agricultural Equipment Dealers Hagie and Oxbo Manufacturing are located in Schoolcraft and the White Pigeon Area.

A significant portion of the irrigated farmland has been passed down through families instead of being sold. With irrigated rental rates in the \$300—\$400 per irrigated acre, land rent provides many families with unearned incomes equivalent to that of employment. A quick informal survey of growers indicated that there may be as many as 250 families in St. Joseph County that are receiving land rental payments that could be considered about equal to employment. Taken as a whole, this would make Agriculture the equivalent of a Top 10 employer in St. Joseph County, not counting the producers or their employees.





Potatoes

Southwest Michigan is a major producer of chipping potatoes used for the snack food industry.

25 % of the potatoes used for the production of potato chips in the US are grown in Michigan.

Southwest Michigan is the most productive area in the state. Approximately 6000 acres of potatoes are produced in the southwest region each season. The average yield of production here is around 425 100 weight units per acre.

The farm gate value of potatoes produced in southwest Michigan is expected to be around \$33 million in 2014.

Approximately \$27 million will be spent on inputs for production (fertilizer, trucking, labor, irrigation, and land rent).

Approximately 2.5 million pounds of potatoes will be produced here, or enough potatoes to make 68 million pounds of potato chips.

100 % of the potatoes grown in southwest Michigan are produced under irrigation.

Fresh Market: While the majority of acres are produced for chipping potatoes, we also have limited acreages that are film bagged for direct consumption. The largest fresh market processing plant in the area is Fresh Solutions, located in St. Joseph County west of White Pigeon. Fresh solutions LLC cleans and packages custom bagged potatoes and onions for the east coast and central US markets. Recently, Fresh Solutions has launched a new product line "Side Delights" brand of frozen potato ensembles for consumers easy to prepare dinner market.



At over 6000 acres of production, potatoes are one of the most important crops in the area.

The major growers in the region are Walther Farms, located in Three Rivers MI, Black Gold, located near Sturgis MI, and Lennard Ag, which is located in nearby Howe Indiana. Smaller but important growers in St. Joseph County include Prairie Edge Farms of Sturgis and LuWayne Yoder Farms of Sturgis.



Snap Beans

Processing

Michigan is the 4th largest producer of snap beans for processing, producing over 6500 acres per year.

The largest in-state processor of snap beans grown in Michigan is the Twin Cities Foods plant located near Lake Odessa in Ionia County. Many of the State's snap beans are shipped to other states for canning, including Wisconsin and Indiana.

Central Produce, located in Dowagiac Michigan manages a very large percentage of the contract produced snap beans produced in Michigan.

100% of the snap beans raised for processing in Michigan are produced under irrigation

Farm Gate Value of Processing Snap Beans in Southwest Michigan: \$9 million

Irrigation allows for double crop production of snap beans following wheat production. Wheat harvested within the first 10 days of June allows snap beans to be harvested in early September, improving profitability for growers in St. Joseph, Cass and Branch Counties.



Tomatoes

Tomato Production in Southwest Michigan

Commercial scale growers in southwest Michigan produce tomatoes for two distinctly different markets.

Growers in Berrien, Van Buren, Allegan, Kalamazoo and Western Cass Counties produce tomatoes for the fresh markets. These are market through brokerage firms and are shipped throughout the region and nation for direct sale to consumers at grocery stores, restaurants and retailers.

Growers in St. Joseph and Branch Counties have traditionally produced tomatoes for the processing industry. The vast majority of this production these days is contracted through Red Gold and is processed at their northern Indiana Processing Plants.

Fresh Market Production is mainly centered in Berrien County, with over 1100 acres of tomatoes raised under raised bed, plastic mulch and trickle irrigation. The farm gate value of this intensive production is estimated to be over \$30 million dollars each year. Production under this system is labor intensive and expensive, requiring around 220 hours of labor per acre for the growing season.

100% of the tomatoes grown commercially in southwest Michigan are produced under irrigation.

Red Gold Facts:

Red Gold contracted with 54 growers in 2014 to produce tomatoes, 31 in Indiana, and the remainder in Ohio and Michigan.

Between 10,000 and 11,000 acres of tomatoes are grown for Red Gold. Between 900 and 1100 acres have been grown in Michigan, mainly in Branch and St. Joseph Counties.

Approximately 460,000 tons of tomatoes are processed by the companies 3 Indiana plants each year.

Indiana ranks second in the nation in tomato production.



Blueberry Production

The Michigan Blueberry industry contributes over \$120 million of farm gate receipts to the Michigan Economy every year. Michigan's blueberry industry is concentrated in South-west Michigan where there are abundant, naturally acidic "blueberry soils". These soils are mostly acidic sandy loams and loamy sands which form on sandy outwash plains. These sites are poorly suited for crops other than blueberries. Current production is between 75 and 110 million pounds a year from 19,000 bearing acres. Michigan blueberry yields average about 5,000 pounds per acre. There is a wide disparity between older, minimally managed fields (2-3,000 pounds) and newer, irrigated, well-managed fields (10,000 pounds or more). Irrigation is needed for maximum yields. About 79% of Michigan's blueberry acreage is irrigated. Solid set overhead sprinklers are very common (53%) because they can also be used for spring frost protection during bloom. Drip irrigation is used on less than 15% of acres, usually on farms with limited water supplies. Traveling guns and sub-irrigation are also used. Most new plantings are irrigated with overhead sprinklers or drip irrigation. Some new plantings utilize dual systems, with both overhead sprinklers and drip irrigation systems.

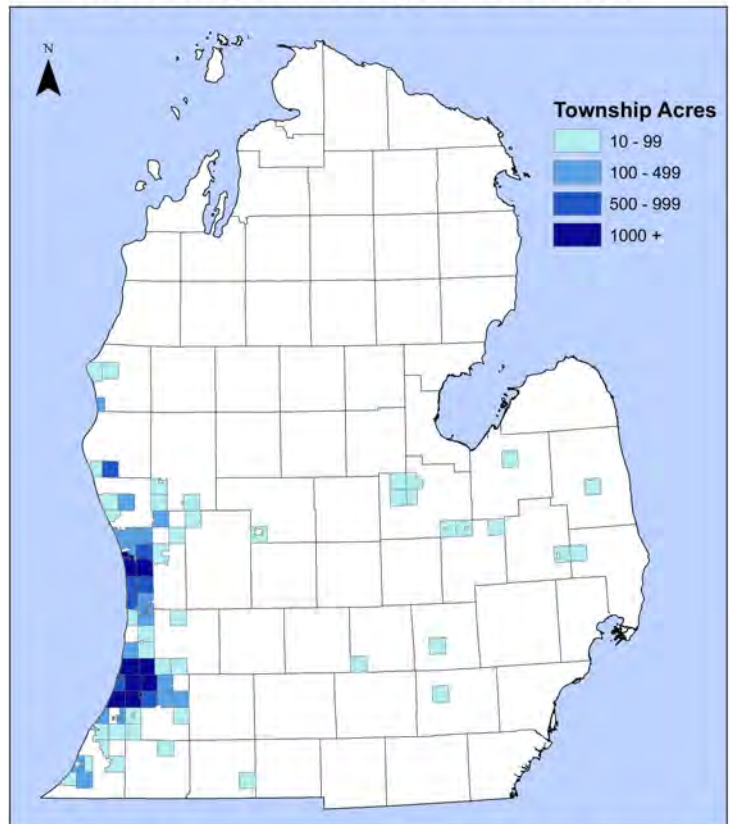
Irrigation is necessary because the blueberry plant thrives in moist soils and does not tolerate drought. Since the root system of a blueberry plant is only about 18 inches deep and most blueberries are grown on sandy soils (which hold about an inch per foot) this requires frequent small irrigations usually once a week or more often when there is no rain. Many blueberry fields have a high water table and soils are naturally wet in the spring, but these soils require supplemental irrigation in the summer and fall. In years with drought conditions, non-irrigated blueberry fields can "burn up" with dead leaves and shriveled shoots and fruit. This impacts not only the current season's crop but also the crop the following season due to the loss of shoots where the future crop would be.

In a recent survey of blueberry growers 42% indicated that they had put in irrigation as a result of MSU Extension programming on blueberry irrigation. An additional 49% had changed the way they irrigate to deliver water in a timely fashion, only 16% believed irrigation was too costly.

When asked if irrigation had increased their yields. 29% said no change, 14% said yields had increased by up to 500 pounds per acre, 16% said between 500 to 1,000 pounds per acre, 33% said yields had increased by over 1,000 per acre.



2011 Michigan Blueberry Production Area



National Agricultural Statistics Service
Michigan Field Office



Over the past 14 years the portion of irrigated blueberries has increased from 68% in 1996 to 79% in 2011. With increased irrigation, yields have increased from 3,700 lb./A (1994-2003) to 4,870 lb./A (2003-2013). Since 2007, blueberry yields have consistently been over 5,000 due to timely and efficient irrigation.

In 2013, the average yield in Michigan was 6,000 #/A resulting in the largest Michigan Blueberry crop ever 114 million pounds

This was following the disastrous 2012 season when an early spring and severe spring freezes virtually wiped out other Michigan fruit crops. This was followed by a severe drought where irrigation saved the current year's crop and allowed healthy bushes to set a heavy crop for the following year in 2013.

Frost control during bloom is an important aspect of water use in Michigan blueberries. Blossoms which are killed by temperatures just below freezing, can be protected during bloom by overhead irrigation down to temperatures in the mid-20s. In 2011 and 2012, Michigan blueberry yields were down dramatically due to spring freezes. Not all blueberry fields can be irrigated at the same time since few growers have the resources to run all their sprinklers continuously for hours several nights in a row and have to choose which fields to project.

Michigan is the number one blueberry producing state with almost 20,000 acres producing more than 100 million pounds of blueberries worth \$120 million dollars. Associated industries such as packing and processing facilities, equipment manufacturers and their employees are all supported by this unique Michigan fruit industry which depends on irrigation to maintain profitable yields.



Pickling Cucumber Production

Southern Michigan has almost the perfect climate and soil conditions for pickling cucumber production.

The crop grows extremely fast, and timely harvest is essential in producing pickles of the right size for the industry. Pickles, like snap beans, have notoriously small root systems, which are very prone to flooding injury. The irrigated sandy soils which dominate the region provide ample protection from flooding, and provide an excellent opportunity to harvest the rapidly developing crop before it gets too large and misses the proper size (grade). Pickles production is centered in Van Buren and St. Joseph Counties, with substantial acres produced in Allegan and Cass Counties. The production in Van Buren County is brined between Decatur and Paw Paw, and provides a substantial amount of the pickles that are used by Subway. The production in St. Joseph County is primarily shipped to Wisconsin for processing by Hartung Brothers.

A significant portion of Berrien County's production is raised for the fresh market rather than processing.

Just over 10,000 acres of pickles are produced in the 8 county region. This number may be low because many fields are double cropped in Van Buren County.

Farm gate receipts from the processing pickles produced in southwest Michigan contribute over \$12 million to the Michigan Economy. Fresh market values may add 4 million.

100% of the pickles commercially produced in southwest Michigan are raised under irrigation.



Pepper and Summer Squash Production

Peppers and summer squash are important high value crops that are produced in the region. Production of fresh market staked raised bed peppers is centered primarily in Berrien and Van Buren Counties. Peppers raised for the processing industry are raised in Branch and St. Joseph Counties.

Summer squash production is based primarily in Berrien and Van Buren Counties. Zucchini and Yellow Squash are produced under drip irrigation on raised beds for the fresh market.

Approximately 1100 acres of bell peppers, and an additional 300 acres of other types of peppers are raised in the region.

The value of these crops is anticipated to be around \$13 million dollars in 2014.

Approximately 1400 acres of summer squash are produced, with an estimated farm-gate value of around \$10 million.

100% of the peppers and summer squash produced in southwest Michigan are grown under irrigation.



Irrigated Commercial Corn and Soybean Production

The vast majority of the remaining irrigated acres in southwest Michigan are used to produce commercial corn and soybeans.

Both corn and soybeans can suffer significant yield losses if prolonged drought stress occurs during the growing season. Corn is sensitive to drought stress for a longer period of time, starting from the rapid elongation phase, peaking at pollination time and remains vulnerable through early grain fill. Soybean yield reduction can also occur early, in extreme circumstances, but is more critical during the late flowering, early pod fill and grain fill growth stages. The region is prone to short term rainfall deficits in July and early August that can impact yields. The sandy soil profiles are incapable of holding adequate moisture to reach full yield potential in many cases during this period.

Average irrigated commercial corn yields in St. Joseph County are approaching 230 Bu per acre, with high yields running in the 260 per acre range. Average dry land yields are approximately 120–130 bu/acre. Irrigation generally will double the yield potential in St. Joseph County with 5-6 inches of supplemental irrigation per acre.

Average soybean yields range from 35 to 45 bu/acre in dry land production in St. Joseph and Western Branch Counties. Irrigated production generally increases yields in the 65-75 bu/acre range.



Severe drought produces smaller ears, less rows of kernels per ear and significantly reduced yields.

The estimated farm gate value increase from irrigated corn and soybean production in the 8 county region is \$50 million dollars using today's prices and average yield increases in both crops.

It is important to recognize that while these crops are lower in value per acre than the other crops we have discussed, they are very important to the field crop producers that raise them. Irrigation helps to ensure production, which allows producers to take advantage of forward marketing opportunities. This can be crucial in times when commodity prices hover around the cost of production.

They are also important to the local economy. Grain terminals such as The Anderson's White Pigeon Facility and the Albion Ethanol Plant, Cargill in Decatur and other smaller mills around the region rely heavily on grain produced under irrigation for their operations. Although in general livestock numbers are down in most of the region, increasing emphasis has been placed on producing feeds under irrigation to keep feed costs and supplies relatively constant during times of drought by livestock producers in our area.



Irrigated soybean plant on the left, dry land area of the field on the right., taken west of Centreville on 8-14-2014. Pictured below is the Anderson's Grain Terminal, west of White Pigeon Mi.



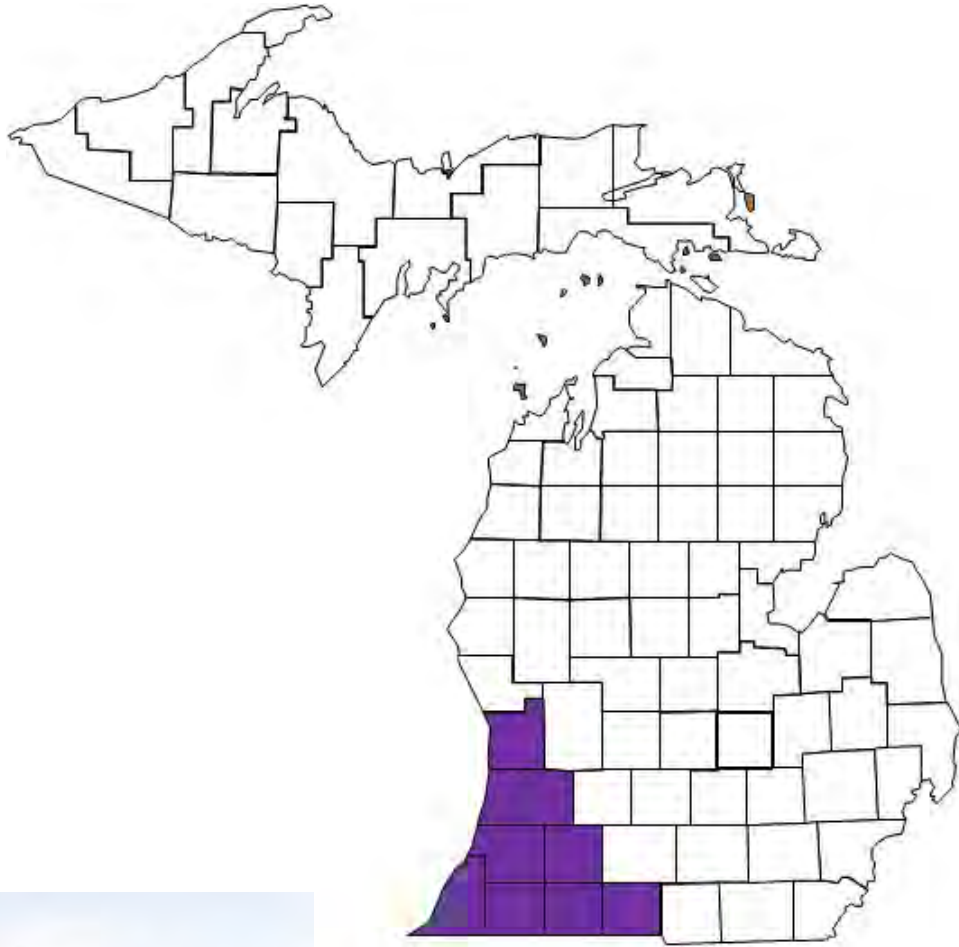
In summary, irrigation is the engine that drives the southwest Michigan agricultural economy.

The irrigated crops highlighted in this publication provide over \$365 million in farm gate income annually in St. Joseph, Berrien, Branch, Cass, Van Buren, Allegan, Ottawa and Kalamazoo Counties. Other vegetables produced in this region, most of which are irrigated, account for an additional \$32 million. The irrigated ornamental and nursery stock industry, centered in Ottawa and Allegan counties, added \$239 million as cited in the 2012 Census of Agriculture. The greenhouse industry added another \$114 million in the Kalamazoo area.

Without irrigation, many of the productive farm fields that you have seen today in St. Joseph, Branch and Cass Counties would likely be livestock pastures. Irrigation opened the door for high value production of field and specialty vegetable crops.

As the world struggles to feed an ever growing population, production of food crops in southwest Michigan will likely grow significantly in the coming decades. The key to this future growth lies in the growers ability to access irrigation water, to protect these high value crops from short term drought stress that can greatly impact yield and quality. It is important that growers both efficiently utilize and protect this renewable resource to ensure that ground and surface water resources remain available for future generations to use and enjoy.







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