

CHAPTER.5

What We Grow



What We Grow

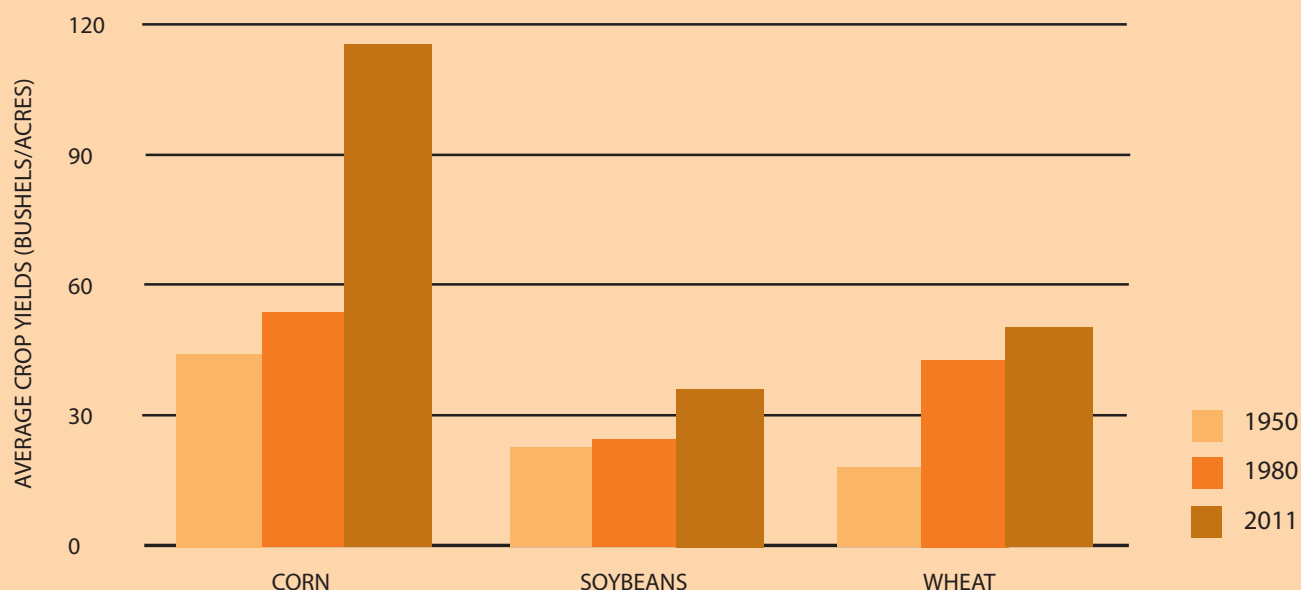
Today, fewer farmers grow fewer types of crops than in our modern history. As the number of farms decreased and the average farm size increased over the last century, American farms began to grow only one or two crops rather than maintain the diversity found on earlier farms.¹ For example, in 2000, the national average number of crops produced per farm had decreased to only one.² The move towards single commodity production and the increased demand placed on farmers for higher yields led the agricultural industry to modernize.³ This modernization included changes such as large-scale mechanization of farming equipment, crop varieties bred for maximum yields, the use of industrial fertilizers and pesticides, and decline in human labor.⁴ Today, farmers gain higher yields from their land than ever before and fewer farms control a greater portion of the U.S. agricultural sector. Between 1950 and 2011, Missouri farms had significantly increased yields in corn, soybeans, and wheat, as illustrated in Graph 5-1.

The increased average crop yields for Missouri corn, soybeans, and wheat between 1950 and 2011 (Graph 5-1) occurred despite the overall decrease in total cropland acreage. With fewer acres in production, Missouri farms increased yields through mechanization, specialization and efficiency. The Saint Louis Regional Foodshed mirrors the state with regard to the decreased diversity and increased grain yields on farms. Where the Saint Louis Regional Foodshed once produced a wide variety of crops, the region's farmland is primarily used to produce field crops such as corn, soybeans, and wheat, as shown in Chapter 4, Table 4-1, illustrating the region's Major Land Resource Areas (MLRAs).⁶

A century ago, more of our cropland produced crops primarily for human consumption, including common fruits and vegetables. With industrialization came a new mantra for farmers: consolidate and specialize. As a result of consolidation, the Saint Louis Regional

GRAPH. 5-1

AVERAGE CROP YIELDS FOR CORN, SOYBEANS, AND WHEAT IN MISSOURI FOR 1950, 1980, 2011⁵



Foodshed saw farms grow larger with fewer farmers. Between 1925 and 2007, farms have specialized in particular crops, illustrated by the 3.95 million acres of corn for grain and 3.54 million acres of soybeans grown in the region in 2007.⁷ Corn and soybean crops occupied more than 76% of the 9,863,989 acres of cropland in the Saint Louis Regional Foodshed in 2007.⁸ Compare these figures to those from 1925, when the Saint Louis Regional Foodshed grew corn for grain on 2,548,617 acres, and had not yet begun growing soybeans.⁹

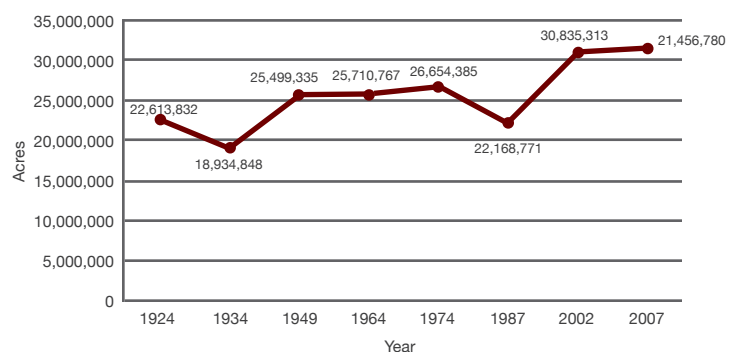
Based on available data, the following section contains several graphs illustrating the change in the types of crops grown, where they were grown, and the amount of land used to grow them between 1925 and 2007. Since the number of farms has decreased substantially and farms have specialized mostly in grain crops over the last half century, some counties only contain one farm that produces a particular fruit or vegetable. In order to protect that lone farm from having its identity revealed through the USDA Census of Agriculture, acreage or yields for that particular fruit or vegetable are withheld from the county level reports. Therefore, the complete data on fruit and vegetable production are not obtainable for the entire Saint Louis Regional Foodshed. However, the available state level data are illustrative. As Graphs 5-2A & 5-2B illustrate, the total cropland dedicated to fruits and vegetables in Missouri and Illinois dropped by nearly half, from 199,726 acres in 1925 to 100,665 acres in 2007,¹⁰ while the cropland designated to field crops increased by roughly 40%, from 22,613,832 acres in 1925 to 31,456,780 acres in 2007.¹¹

Since complete acreage for fruit and vegetable production is only available at the state level, Graph 5-3 illustrates more specifically how many acres on which farmers grew particular fruits and vegetables between 1925 and 2007 in Missouri and Illinois.¹² Likewise, Graph 5-4 illustrates the acreage Missouri and Illinois designated to specific field crops between 1925 and 2007, in thousands of acres.¹³

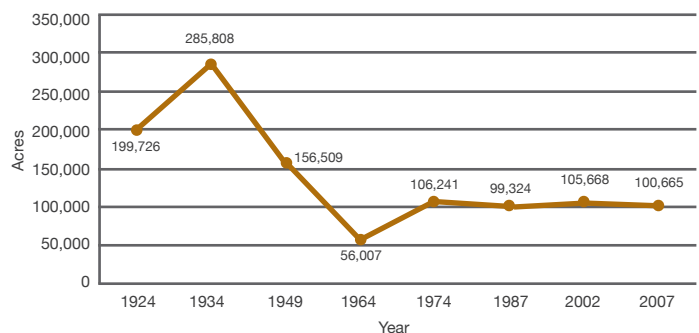
Over the course of 82 years, the Agriculture Census has continuously reported acreage for a few fruits and vegetables grown in Missouri and Illinois. In 1925, sweet corn and white potatoes were planted on the most acreage of the fruits and vegetables reported. From 1974 to 2007, sweet corn maintained the most designated acres of all the fruit or vegetable across the bi-state area. In the context of the Foodshed's nine million crop acres, however, even this acreage is a small amount, considering that across two states in 2007, farmers grew less than 22,000 acres of sweet corn. Except for cucumbers and snap beans, all the fruits and vegetables reported and displayed in Graph 5-5 have had a decreasing trend in total acreage across Missouri and Illinois. In 2007, cucumbers and snap beans, having increased in acreage over the 82-year period, came in at only 8,165 acres and 19,628 acres, respectively.

Comparing Graph 5-4 to Graph 5-3, Missouri and Illinois have continuously prioritized cropland to grow corn for grain. Corn for grain acreage was lowest in 1934 with 8,410,000 acres and highest in 2007 with 16,532,000 acres. Compare that to table crops sweet corn and white potatoes, the vegetables grown on the most acreage in 1934 with 72,083 acres and 105,000 acres, respectively. The smallest acreage designated to a field crop over the course of the 82-year span was 32,000 acres for oats for grain in 2007, and yet, oats for grain still occupied more acreage than any fruit or vegetable that same year. Through these two graphs, it is clear that the U.S. agriculture industry discounted the importance of producing local fruits and vegetables as farmers focused their attention on planting most of their land with only a few field crops.

GRAPH. 5-2A
TOTAL CROPLAND DESIGNATED TO GRAIN AND FORAGE MISSOURI AND ILLINOIS, 1925-2007



GRAPH. 5-2B
TOTAL CROPLAND DESIGNATED TO FRUIT AND VEGETABLE ACREAGE IN MISSOURI AND ILLINOIS, 1925-2007

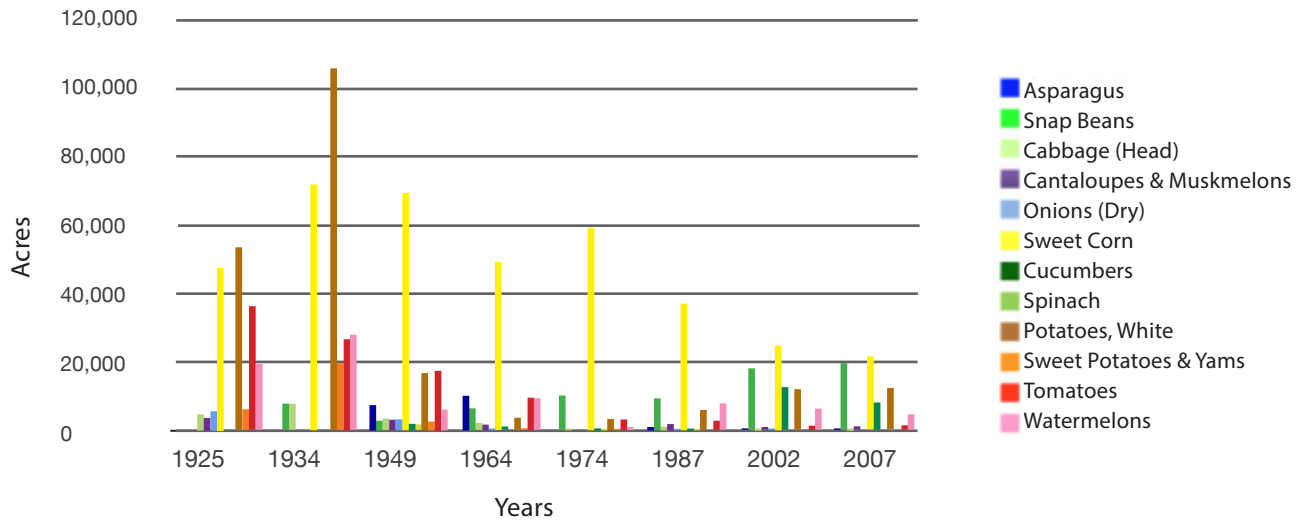


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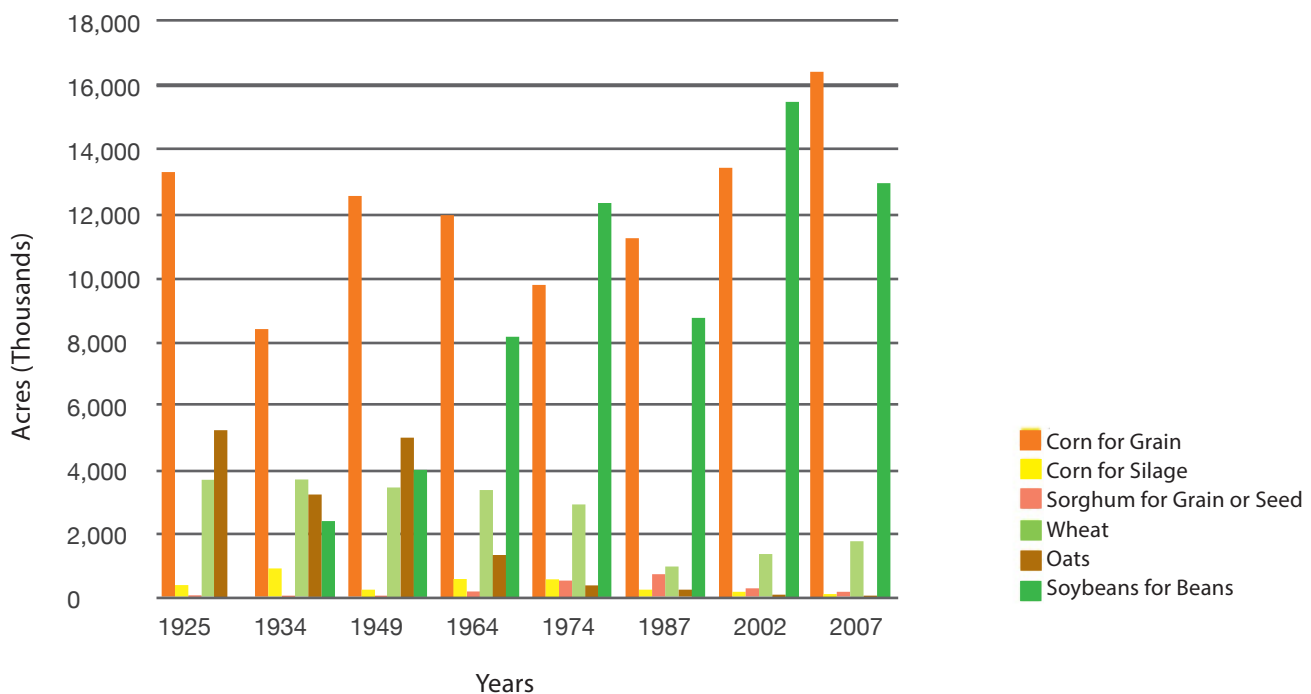
Missouri and Illinois have continuously prioritized cropland to grow corn for grain.

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GRAPH. 5-3
ACRES OF FRUITS AND VEGETABLES IN MISSOURI
AND ILLINOIS, 1925-2007



GRAPH. 5-3
ACRES OF FIELD CROPS IN MISSOURI AND ILLINOIS,
1925-2007

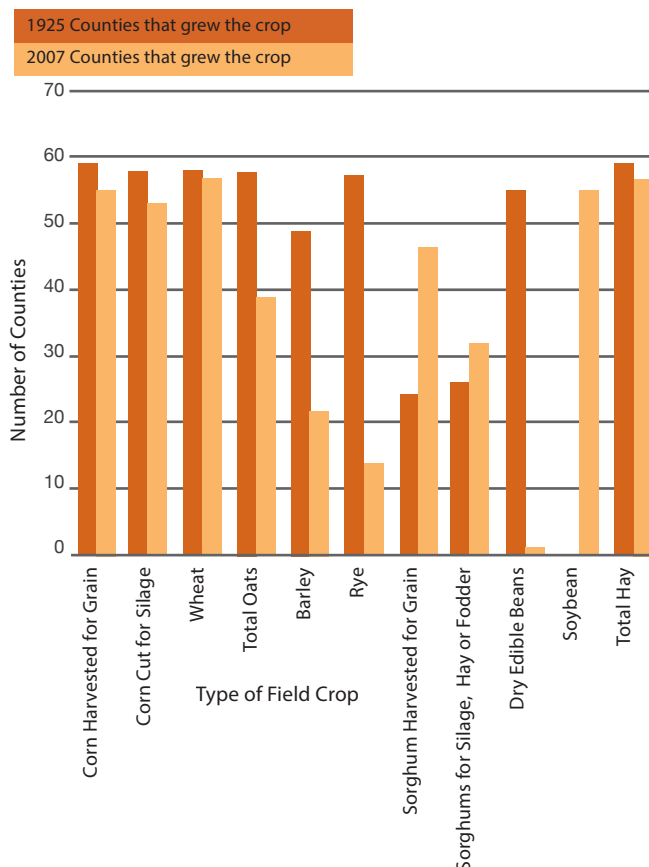


Further, it is important to note that in the 1974 Census of Agriculture most of the acreage reported for specific crops was only from farms that made \$2,500 or more in sales per year. It is no coincidence that this type of reporting occurred around the time when Secretary of Agriculture Carl Butz came to office and emphasized maximizing profit and industrializing farming practices.

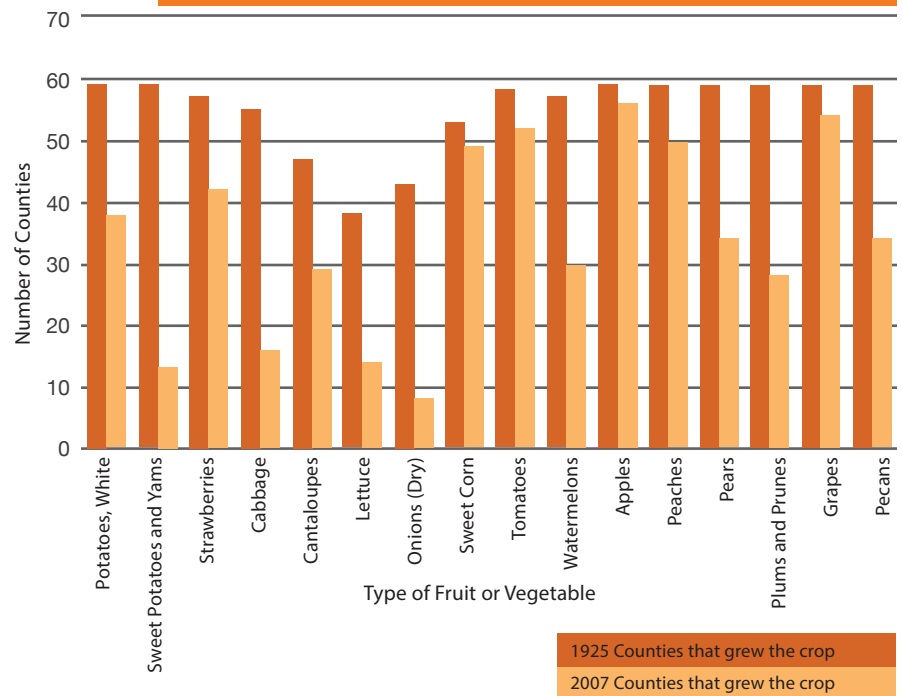
Butz advocated increasing production. In 1973, he reduced the number of acres “set aside” – or taken out of grain production – from 25 million acres in 1972 to 7.4 million acres in ‘73. He went on a speaking tour and encouraged farmers to “plant fence row to fence row” to meet global demand. He also advised farmers to “get big or get out ... adapt or die,” in the belief that bigger farms were more productive.¹⁴

In addition, The Guardian adds with Butz’s “get big or get out” motto, he “encourag[ed] the growth of corporate factory-farms and increasing subsidised [sic] production of staples for export.”¹⁵ Thus, designating acreage to the fruits and vegetables needed for proper nutrition has been not been a priority in the last 40 years.

GRAPH. 5-6. COUNTIES IN THE SAINT LOUIS REGIONAL FOODSHED THAT PRODUCED FIELD CROPS, 1925 & 2007



GRAPH. 5-5. COUNTIES IN THE SAINT LOUIS REGIONAL FOODSHED THAT PRODUCED FRUIT AND VEGETABLES, 1925 & 2007



While county level data on acreage of fruits and vegetables is incomplete, Graph 5-5¹⁶ displays the number of counties that have produced particular fruits and vegetables in 1925 and 2007. It shows that many Saint Louis Regional Foodshed counties once grew many more varieties of crops than they do today. Likewise, Graph 5-6¹⁷ illustrates the number of counties that have produced particular field crops in 1925 and 2007.

In every fruit and vegetable category reported, the number of counties producing those fruits and vegetables has decreased between 1925 and 2007 (Graph 5-5). The decrease in counties growing fruits and vegetables could be the result of multiple factors, one of which is likely to be the result of federal farm policy’s emphasis on field crops. Meanwhile, aside from sorghum, the number of counties producing field crops has also decreased across the board, but more than 75% of the Saint Louis Regional Foodshed counties have continued to produce six of the 11 field crops displayed in Graph 5-6. In contrast, more than 75% of the region’s counties are producing only five of the 16 fruits, nuts, and vegetables displayed in Graph 5-5.

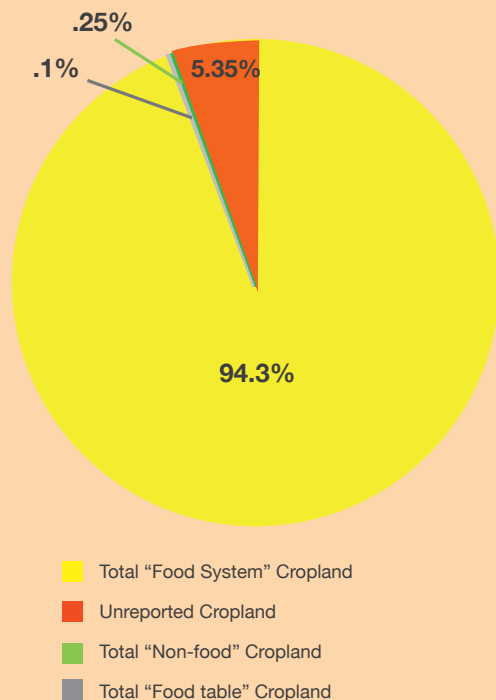
At the county level, the USDA’s National Agriculture Statistics Service collects data from the Agriculture Census and provides acreage disclosed by farmers for each crop produced. Commodities that reach our dinner tables in the same form as they were in the field are referred to as “Food Table” crops. Commodities that reach the dinner table only after conversion into processed foods or as food sources for livestock feed, are categorized as “Food System” crops. Commodities that never reach the dinner table, but are instead used for non-food purposes such as ethanol and vegetation for lawns, are categorized as “Non-Food” crops. Table 5-1 below displays the cropland acreage disclosed by farmers in the Saint Louis Regional Foodshed for each crop and categorizes them based on each crop’s contribution to the food system as either a “Food Table” crop, “Food System” crop, or a “Non-Food” crop. Graph 5-7 below illustrates the amount of regional cropland designated to each of these crop-use categories.¹⁸

TABLE 5-1

ACREAGE DESIGNATED TO DIFFERENT CROPS GROWN IN THE SAINT LOUIS REGIONAL FOODSHED

REPORTED CROPS 2007		ACRES		
"FOOD SYSTEM CROPS"	SOYBEANS-HARVESTED	3,544,538	SWEET POTATOES, FRESH MARKET -HARVESTED	6
	CORN & GRAIN-HARVESTED	3,948,998	BROCCOLI, FRESH MARKET -HARVESTED	3
	HAY & HAYLAGE-HARVESTED	936,095	GARLIC -HARVESTED	3
	WHEAT-HARVESTED	723, 909	LETTUCE -HARVESTED	3
	SORGHUM, GRAIN-HARVESTED	97,280	PEAS, GREEN, SOUTHERN (COW PEAS) -HARVESTED	3
	CORN, SILAGE-HARVESTED	45,945	CABBAGE, HEAD, FRESH MARKET -HARVESTED	1
	OATS -HARVESTED	2,207	CARROTS -HARVESTED	1
	SORGHUM, SILAGE -HARVESTED	992	OKRA -HARVESTED	1
	BARLEY -HARVESTED	461	PEACHES	1,325
	RYE -HARVESTED	380	GRAPES	1,313
	FIELD CROPS,OTHER -HARVESTED	49	APPLES	572
	TOTAL FOOD SYSTEM CROP ACREAGE	9,300,854	BERRY TOTAL	352
"NON-FOOD CROPS"	% TOTAL CROPLAND	94.3%	MELONS, WATERMELON -HARVESTED	73
	SOD -HARVESTED	1,769	MELONS, CANTALOUPE -HARVESTED	60
	GRASSES AND LEGUMES-HARVESTED	22,798	PEARS	16
	SHORT TERM WOODY CROPS, IN-PRODUCTION	346	PLUMS & PRUNES	8
	FLORICULTURE TOTALS IN THE OPEN	171	RASPBERRIES	6
"FOOD TABLE CROPS"	TOTAL "NON-FOOD" CROP ACREAGE	25,084	CHERRIES, SWEET	2
	% TOTAL CROPLAND	0.25%	APRICOT	1
	HORSERADISH -HARVESTED	1,332	NECTARINES	1
	SWEET CORN -HARVESTED	807	PUMPKINS -HARVESTED	791
	TOMATOES, IN THE OPEN, HARVESTED	279	SUNFLOWER -HARVESTED	573
	CUCUMBERS -HARVESTED	164	POPCORN, SHELLS -HARVESTED	317
	PEPPERS, BELL -HARVESTED	56	TREE NUT TOTALS	785
	POTATOES -HARVESTED	56	PECANS	273
	BEANS, SNAP-HARVESTED	51	TREE NUTS, OTHER	111
	EGGPLANT, FRESH MARKET-HARVESTED	18	WALNUTS, ENGLISH	7
	VEGETABLES, OTHER -HARVESTED	17	CHESNUTS	1
	PEPPERS, CHILE -HARVESTED	11	TOTAL "FOOD TABLE" CROP ACREAGE	9,436
	TURNIPS, FRESH MARKET -HARVESTED	9	%TOTAL CROPLAND	0.10%
	ASPARAGUS, FRESH MARKET-HARVESTED	8	TOTAL ACRES REPORTED FOR INDIVIDUAL CROPS	9,335,374
	BEETS -HARVESTED	7	TOTAL CROPLAND	9,863, 989
	SQUASH, FRESH MARKET-HARVESTED	7	REPORTED CROP ACREAGE AS % OF TOTAL CROPLAND	94.6%
	RHUBARB-HARVESTED	6	UNREPORTED ACREAGE	528,615

GRAPH. 5-7
SAINT LOUIS REGIONAL FOODSHED CROPLAND
BY CONTRIBUTION TO THE FOOD SYSTEM, 2007



As Table 5-1 illustrates, of the 9.9 million acres of cropland in the Saint Louis Regional Foodshed, 7.5 million acres produced corn for grain and soybeans and 9.3 million acres, or 94% of the region's total cropland, produced "Food System" crops in 2007.¹⁹ "Food Table" crops, which are common nuts, fruits and vegetables, made up merely 0.1% of the reported cropland acreage in 2007.²⁰

As Table 5-1 and Graph 5-7 illustrate, 5.35% of the total cropland in the Saint Louis Regional Foodshed was not accounted for at the county-level for crop-specific acreage (noted as "unreported cropland in the Graph 5-7). However, Table 5-2 displays all of the other commodities reported as having acreage in the Saint Louis Regional Foodshed, and together they comprise some of the 5.35% "unreported cropland."²¹

As shown in Table 5-1, 94% of the region's cropland is designated to "Food System" crops. The question then is, for what purposes are these "Food System" crops grown? As stated previously, soybeans and corn for grain occupy 76% of the cropland in the Saint Louis Regional Foodshed. The agriculture industry produces corn and soybean for a variety of purposes, such as livestock feed and oil production. The U.S. is the world's leading producer and exporter of processed soybeans,²² which are the "world's largest source of" livestock feed "and the second largest source of vegetable oil."²³ More than 80% of the nation's soybean production is centered in the Upper Midwest.²⁴ Soybeans are Missouri's top export crop and contributed \$1.39 billion to Missouri exports in 2010.²⁵ Corn produced in the Foodshed is likely used mostly for livestock feed, processed foods, and ethanol production. The grain crops, sorghum, wheat, corn, and oats, are used for both livestock feed, brewing, and processed foods.

TABLE. 5-2
CROPS PRODUCED IN THE SAINT LOUIS REGIONAL FOODSHED
WITH UNDISCLOSED ACREAGE, 2007

ALMONDS	GREENS, KALE – HARVESTED
AQUATIC PLANTS, IN THE OPEN, IN-PRODUCTION	GREENS, MUSTARD – HARVESTED
BEANS, DRY EDIBLE, (EXCLUDING LIMA) – HARVESTED	GREENS, TURNIP – HARVESTED
BEANS, GREEN, LIMA – HARVESTED	HAZELNUTS
BERRIES, OTHER	HERBS, DRY, IN THE OPEN – HARVESTED
BRUSSELS SPROUTS – HARVESTED	HERBS, FRESH CUT, IN THE OPEN – HARVESTED
BULBS, CORMS, RHIZOMES & TUBERS, IN THE OPEN, DRIED – IN PRODUCTION	MUSHROOMS – SQUARE FEET IN PRODUCTION
CABBAGE, CHINESE – HARVESTED	ONIONS, DRY – HARVESTED
CANOLA – HARVESTED	ONIONS, GREEN – HARVESTED
CAULIFLOWER, FRESH MARKET – HARVESTED	PEAS, CHINESE (SUGAR & SNOW) – HARVESTED
CHERRIES, TART	PEAS, GREEN (EXCLUDING SOUTHERN) – HARVESTED
EMMER & SPELT – HARVESTED	PERSIMMONS
FLOWER SEEDS, IN THE OPEN – IN PRODUCTION	RADISHES – HARVESTED
GINSENG – HARVESTED	RICE – HARVESTED
GRASSES & LEGUMES, OTHER, SEED – HARVESTED	SORGHUM, SYRUP – HARVESTED
GRASSES, BROMEGRASS, SEED – HARVESTED	SPINACH, FRESH MARKET – HARVESTED
GRASSES, ORCHARDGRASS, SEED – HARVESTED	TOBACCO – HARVESTED
GREENS, COLLARD – HARVESTED	TRANSPLANTS, COMMERCIAL, VEGETABLE & STRAWBERRY, IN THE OPEN – IN PRODUCTION

An analysis at the national level provides some insight. Pimentel's 1994 report says "of the total domestic consumption of cereal grains 72% are used to feed livestock, 11% are for direct human consumption, and the remaining 17% are used ... to produce different food products and alcoholic beverages. Therefore, almost 90% of the cereal grains are consumed indirectly by Americans." In addition, "[a] large fraction of soybeans is used for feeding livestock, either directly or in the form of by-products (bean meal) of soy oil production, and in the food industry to produce soy oil for human consumption."

Ironically, farmers who once grew food for themselves, their livestock and their neighbors, now go to the store to buy food for their table (Walmart has the largest market grocer share in our region) while their crops go to export, the feedlots, or the gas tank. Farmers' fields have been transformed from exemplifying the idiom 'farm to fork' daily, which provides the necessary food to feed families, to producing corn and soybeans, fit for livestock consumption, convenience and processed foods, and fuel but inedible to humans directly from the field. It is unclear how much of the crops grown in the Saint Louis Regional Foodshed ultimately remain in the region; however, it is clear most of them do not travel directly to our tables.

Not all farmers have resorted to growing grain crops to feed livestock and for the processed food system. According to the 2007 Census of Agriculture, there are small farms that produce commodities that the region consumes every day, as seen in Table 5-1 and Table 5-2. In addition, some small farms are producing organic crops. Thirty-seven counties in the Saint Louis Regional Foodshed produced organic crops on 2,588 acres (Map 5-1), yet data was withheld from 20 counties, meaning organic production is occurring on more acreage than disclosed.²⁹ In addition, regional orchards made up 6,142 acres. (Map 5-2).³⁰

MAP. 5-1

ACREAGE DESIGNATED TO ORGANIC CROP PRODUCTION, 2007

 2010 State Boundaries

 2010 County Boundaries

Number of Acres in Organic Production, by County

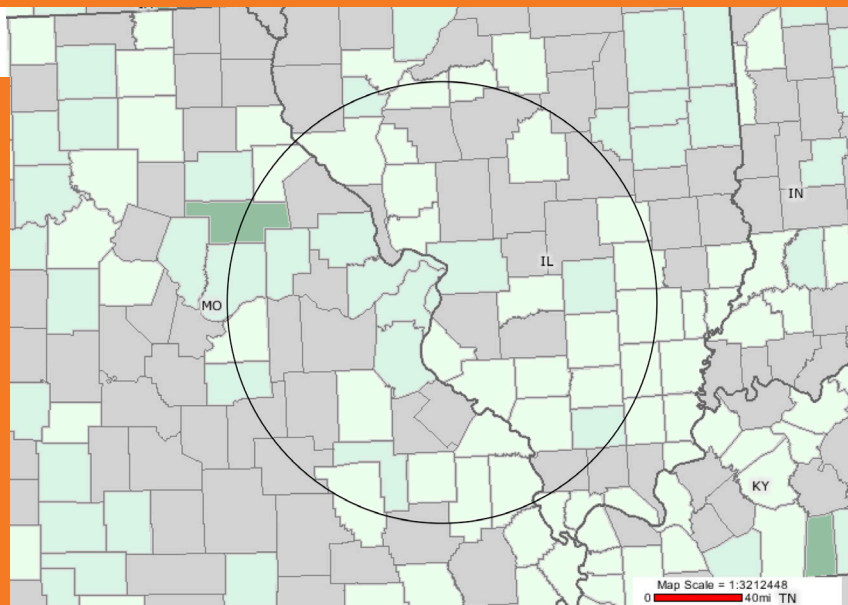
 Not Disclosed

 0-1,000

 1,000-2,500

 2,500-10,000

 10,000-30,000

 Less Than 1 Acre


MAP. 5-2

ACREAGE DESIGNATED TO ORCHARDS, 2007

 2010 State Boundaries

 2010 County Boundaries

Number of Acres in Orchards, by County

 Not Disclosed

 0-1,000

 1,000-2,500

 2,500-10,000

 10,000-30,000

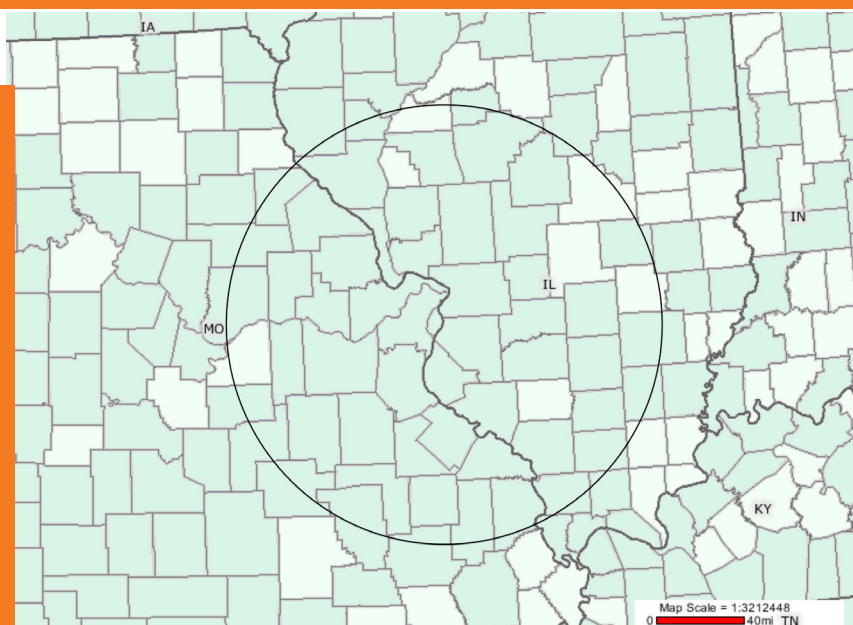
 Less Than 1 Acre


FIGURE. 5-1
ECKERT'S FARMS PHOTO COLLAGE³³



One example of a regional fruit producer is the family favorite, Eckert's Orchards, which has 150 acres designated to apple production.³¹ Eckert's has three pick-it-yourself farms in Belleville (St. Clair County), Millstadt (St. Clair County) and Grafton (Jersey County), Illinois.³²

All three Eckert's farms produce strawberries in May and June, apples from early August until

mid-October, and pumpkins in October.³⁴ Belleville and Grafton provide blackberries in limited and good supply, respectively, during June and July.³⁵ Belleville and Grafton farms provide peaches in July and early August and the Belleville and Millstadt farms provide Christmas trees from the end of November through December.³⁶

As illustrated previously in Table 5-1, there are several farms producing vegetables in the Saint Louis Regional Foodshed. Graphs 5-8 and 5-9 display the number of operations that have acres of vegetables,³⁷ and the size distribution of all vegetable harvesting operations, respectively.

Graph 5-8 illustrates that in 2007 the Saint Louis Regional Foodshed used some of the 520,714 acres of the undisclosed cropland to produce a wide variety of vegetables (and also fruit). Some commodities such as tomatoes, sweet corn, and pumpkins are harvested by numerous operations. The majority of these operations are smaller than 5 acres, which is illustrated in the Graph 5-9. In 2007, 1,198 operations in the Saint Louis Regional Foodshed harvested vegetables. Of those operations, 50% (598 operations) did not disclose their acreage and 37% (440 operations) harvested vegetables on less than five acres (Graph 5-9).³⁸

There is a clear link between America's diet trends and the crop production trends. To recap from Chapter 3, the average American consumes more than the recommended amount of grain (but not enough whole grain), more than the recommended amount of protein from meat alone, and more than the suggested daily limit of 40 grams or 10 teaspoons for added sugar. In addition, the average American consumes the recommended amount of fruit, but mostly from non-fresh sources, and consumes less than the recommended amount of vegetables. As farmers have grown more soybeans and crops for grain, our consumption of processed

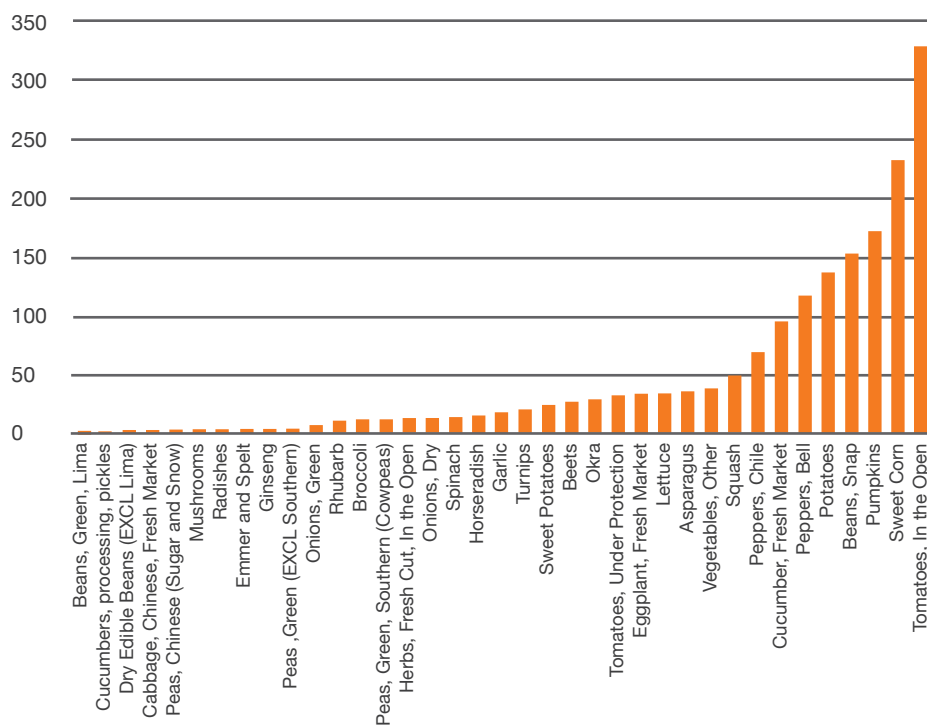
food has likewise increased. This is linked to the shift in farm policy priorities in the 1970s when President Nixon appointed Earl Butz Secretary of Agriculture. Butz aimed to make food cheaper to the consumer, through subsidizing massive plantings of corn and grains. Butz's policies benefited the burgeoning fast-food industry, as well as makers of processed foodstuffs.

As corn crops multiplied, high-fructose corn syrup replaced cane sugar in processed food and drinks. Carl Butz also encouraged large-scale importation of palm oil, or "tree lard", a cheaper but less healthy cooking fat. According to Greg Critser, author of *Fat Land*, these policies resulted directly in the larger and larger portions offered by fast food outlets and soft drink producers, helping make America the world's fattest nation.³⁹

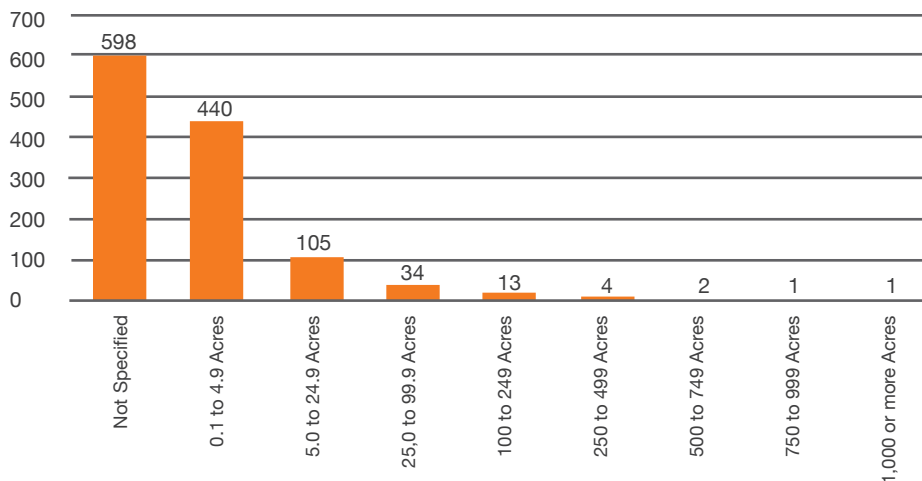
At the simplest level, the law of supply and demand helps keep the cost of corn syrup, soy additives, meat, and processed flour low relative to other foods because they are so abundant. Fruits and vegetables are less abundant and their prices in the grocery store reflect that. A pint of unprocessed, organic raspberries is often more expensive than a box of Twinkie snack cakes. Consumers seeking the most perceived value for their dollar are often lured by the lower prices. They can feed more people with the cheaper food for the same money. Many Americans and institutions

like schools and hospitals have little choice but to shop for quantity over quality. Federal farm policies and subsidies complicate the situation further, skewing markets, and ensuring profits for commodity farmers regardless of demand- so they keep growing what pays and the food industry finds a way to use the crops.

Our meat overconsumption is also linked to the increase in grain and forage crops because much of those crops are used for animal feed. Meanwhile, the average American does not get enough vegetables in her diet, which corresponds with the continued decrease in fruit and vegetable production. Our consumption of fruit falls within the recommended range, but much of the fruit we eat today is processed, and may have added caloric sweeteners like natural sugar and corn syrup. With a decrease in acreage for fruit production, much of the fruit we consume is imported from other countries. In addition, the United States utilizes some of its corn production to make corn syrup, a caloric sweetener. Our overconsumption of caloric sweeteners can be associated with the consumption of processed foods, such as soda, fruit drinks, sugared cereals, and frozen treats. The emphasis on field crops and the ways we use those field crops are having a direct effect on the greater availability of less nutritious food. We may be importing more of our fruits and vegetables as a result. Fruits and vegetables tend to lose flavor, freshness, and nutrients the farther they travel from the fields where they were grown.



GRAPH. 5-8
NUMBER OF VEGETABLE OPERATIONS IN
THE SAINT LOUIS REGIONAL FOODSHED, 2007

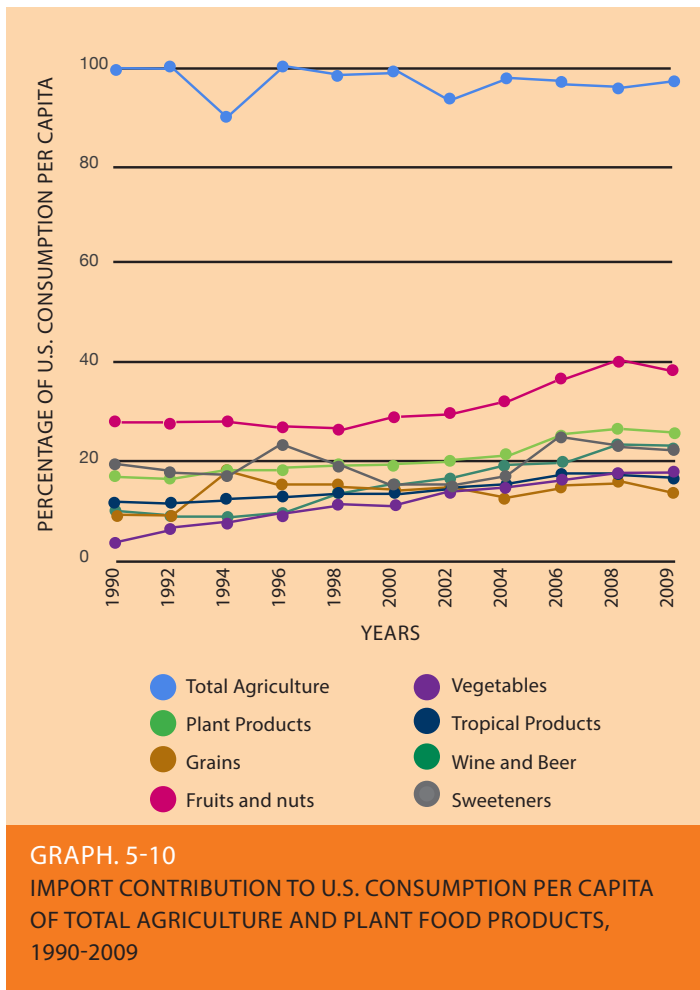


GRAPH. 5-9
NUMBER OF OPERATIONS, BY TOTAL
ACREAGE OF VEGETABLE HARVESTED, 2007

While national population has risen, the increase in consumption of imported foods is likely more attributable to increased production of top commodity crops needed for many of the nation's processed foods and for livestock than to feed the nation's growing population. Some of the blame lies with the farm subsidies that make those crops profitable. Graph 5-10 displays the change in percent of consumption per capita sourced from outside the United States.⁴⁰ Total agriculture, designated by the top blue line on Graph 5-10 represents "[a]ll other foods except eggs, tree nuts, fresh fruits and vegetables."⁴¹ Animal Products "[i]ncludes added animal fats (butter, lard, and edible tallow" in addition to the meat categories individually displayed. ⁴² Plant Products, illustrated by the highest green line on Graph 5-10, "[i]ncludes added vegetable oils and fats and "peanuts, essential oils, and

food preparations" in addition to the individual plant-based categories displayed.⁴³

From 1990 to 2009, national consumption per capita of imported goods increased for every food group except for Tropical Products and Red Meat.⁴⁴ According to the Economic Research Service, the contribution of imported Tropical Products to the Tropical Products food supply, as illustrated by the highest blue line on Graph 5-10, reached 102.8% in 1992.⁴⁵ Tropical Products are "[b]ased on net imports of coffee, cocoa, tea, and spices" and [w]hen some imports are re-exported and consumption falls below import levels, import share exceeds 100 percent"⁴⁶ (as when a food processor imports sugar then exports the processed product).



Since 1990 the contribution of imports to U.S. food supply has increased in almost every category – both plant food products and animal food products. Except for tropical products, all of our plant-based imports have increased between 1990 and 2009: grains (9.3% to 13.4%), fruits and nuts (28 to 38.5%), vegetables (3.4 to 17.5%), sweeteners (19.3 to 22.4%), tropical products (99.8 to 97.2%), wine and beer (9.9 to 23%).⁴⁷ Except for red meat, our animal-based imports have increased as well: red meat (8.1 to 7.7%), poultry (0% to 0.3%), dairy products (1.9 to 2.2%), and fish and shellfish (56.3 to 85.2%).⁴⁸

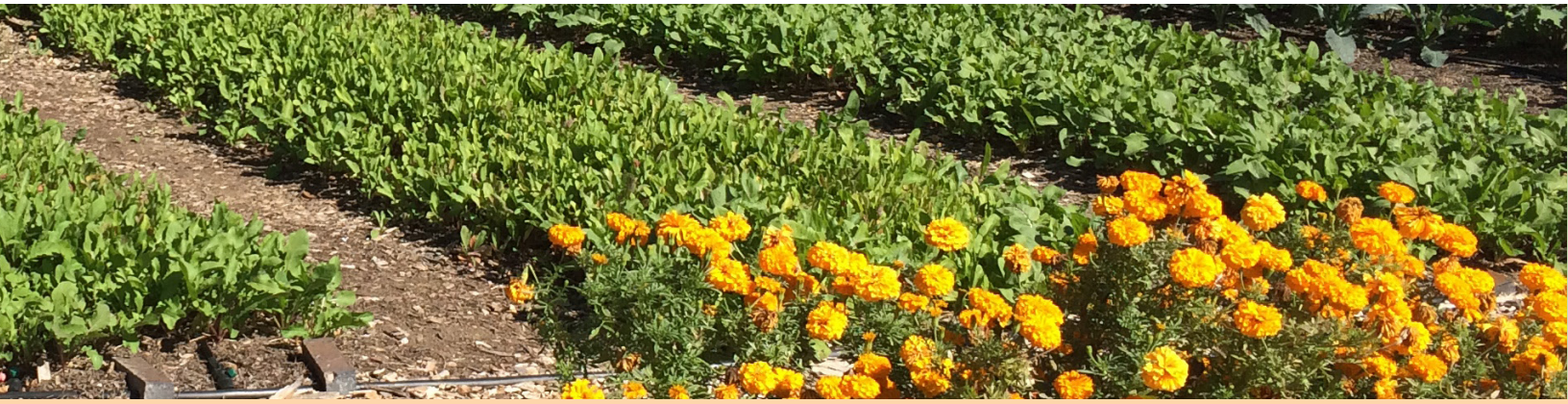
There is a clear disconnect between the nation's health needs and our food system. Americans need to eat more fresh fruits and vegetables which contrasts with the continued growth of commodity crops that go into the processed foods that our nation over-consumes and the non-food products that feed livestock, which the nation also over-consumes. Horrigan et al. states "[a] reduction in meat consumption would help alleviate land scarcity because 37% of the world's grain, and 66% of U.S. grain production, is fed to livestock."⁴⁹ More research is needed to determine the extent to which land scarcity and livestock production impact farming and crops in our Foodshed. Environmental health and wildlife are also impacted by the prioritization of commodity crops. Environmental Working Group and Defenders of Wildlife reported that "growers plowed under more than 23 million acres of grassland, shrub land

and wetlands in order to plant commodity crops between 2008 and 2011,"⁵⁰ of which grain crops are the majority. Growing crops on these fragile lands risks exhausting the soil, increases crop loss risk during extreme weather (drought, flood) and increases costs to American taxpayers subsidizing crop insurance. And yet the lure of high crop profits, driven by farm policy, is irresistible to many farmers.

The focus on high yields impacts the nutrients on our plates, too. The grains grown on America's farms today may have fewer nutrients than they did a century ago because of added fertilizers that skew the mineral balance in crops. Studies have shown an "inverse relation between plant yield and mineral concentration" in the plants, referred to as the "dilution effect."⁵¹ "It has been noted since the 1940s that yield increases produced by fertilization, irrigation, and other environmental means tend to decrease the concentrations of minerals in plants."⁵² Davis reviewed studies that found the reductions in nutrients in wheat, maize, fruits and vegetables due to dilution effects.⁵³

The authors of the three studies "calculated ratios of nutrient contents, R (ratio) = new/old, for each food and nutrient, where the new and old dates differed by [approximately] 50 to 70 years."⁵⁴ Thus, a ratio of 1 (new/old) would translate to a finding of the same nutrient concentration level in both the old and new samples. The median nutrient concentration ratios of 20 vegetables were as follows: 0.82 for calcium, 0.77 for magnesium, .89 for iron, 0.19 for copper, 0.6 for sodium, 0.88 for potassium, and 1.1 for phosphorus. The median nutrient concentration ratios of 20 fruits were as follows: 0.97 for calcium, 0.99 for magnesium, 0.81 for iron, 0.72 for copper, 1.1 for sodium, .88 for potassium, and 1.3 for phosphorus.⁵⁵ Further, another study of "43 garden crops, mostly vegetables" found these median ratios for the following nutrients: 0.95 for protein, 0.98 for fat, 1.1 for CHO (carbohydrates), 0.93 for ash (mostly potassium), 0.83 for calcium, 0.91 for phosphorus, 0.88 for iron, 0.82 for vitamin A, 1.1 for thiamin, 0.62 for riboflavin, 0.99 for niacin, and 0.83 for vitamin C.⁵⁶ Lastly, a study of red raspberry plants with three different amounts of phosphorus fertilizer application (0 parts per million, 22 parts per million, and 44 parts per million. For farmers, parts per million multiplied by two gives a rough estimate of pounds per acre) revealed that while the plants given largest amount of phosphorus fertilizer had "20% higher concentration of phosphorus than unfertilized plants (dry weight basis)" after eight months, they had decreased mineral concentrations of nitrogen, potassium, calcium, magnesium, manganese, copper, boron, and zinc.⁵⁷ These declines were "usually by 20% to 55%."⁵⁸ The results of these studies illustrate that in addition to our industrialized agriculture system prioritizing higher yields of grain crops, which we over-consume and which fail to provide us with the variety of essential nutrients we need for healthy bodies, the focus on yield may also be reducing the nutrient concentration in the few fruits, grains, and vegetables grown by stressing maximum production per acre.

Why are we growing priority grain crops with insufficient consideration of our biological need for the nutrients in fruits and vegetables? The answer is found in a one very powerful, complex piece of legislation called the Farm Bill.



A Food System Key: The American Farm Bill

Kathleen Logan Smith, Director of Environmental Policy, Missouri Coalition for the Environment:

The Farm Bill contains more than a dozen “titles” or packages of legislation. Here are a few of the mechanisms now in the 2008 Farm Bill that deliver taxpayer dollars to food producers and how they affect our food:

[1] The Commodity Title, which sets price “floors” and price “targets” for certain crops- mainly corn, wheat, rice, cotton, and soybeans. In recent years, with grain prices like \$7 per bushel corn, these floor and target payments have hardly been made. Should crop prices drop, for instance in the case of corn less than \$2 or \$3 per bushel, these may regain their prominence. Until then, few taxpayer dollars are traveling this route. The Commodity Title also contains a “Direct Payment” program in which farmers get a payment based on the crop history and historic yield of the land for commodity crops. This program was created in 1996 as a tool to wean farmers from commodity payments. It has failed. It is now considered a “money for nothing” payment. The program does, however, increase the value of cropland - becoming a bankable asset, and includes penalties for landowners seeking to grow fruit and vegetable crops on land that has historically grown commodity crops. . . .

[3] Crop Insurance Title, which subsidizes 18 insurance companies to offer crop insurance to farmers while also subsidizing farmer’s premiums for those policies. The commodity crop farmers benefit most from crop insurance because the policies are most practical for industrialized, monoculture farming. It is a defect that good policies are not yet practical for organic, diversified, sustainable farming operations. Typically, an organic soybean farmer who suffers a crop loss to drought, flood or pests, can only insure the value of the non-organic soybeans, despite the premium price organic soybeans get in the market.

A Community Supported Agriculture farm growing many crops for the market would find it impractical and prohibitively expensive to take out dozens of policies on each type of food grown.

Crop insurance that minimizes risk helps encourage farming. Then there’s another kind of insurance called “revenue insurance” which goes beyond reducing the risk of farming and makes sure it pays.

With revenue insurance farmers take out policies (subsidized) to insure a certain per bushel price for their crop. Before spring planting, a corn farmer can insure his harvest at his preferred level of a \$6.01 per bushel price guarantee that will be assumed for his typical recorded yield--for instance, 150 bushels per acre on designated acreage. If the harvest prices for corn drop below the guaranteed price per bushel, the farmer collects the difference. With revenue insurance, no disaster need befall the farmer. In fact, farmers with a record harvest can still collect since they are insuring a high price, not just a crop failure. In a good harvest year, prices inevitably drop at harvest time because of supply and demand. Predictably, revenue insurance is popular with farmers of commodity crops. Its cost to taxpayers is escalating at an astonishing rate. Revenue insurance is now the major avenue for farms to receive taxpayer support, dwarfing price supports. Subsidizing risk serves to encourage risk-taking, and in agriculture that reality is evident when farmers begin to cultivate remaining native and sensitive lands with a low probability for a good crop, but a high probability of an insurance payment.⁵⁹



“ We, the residents of the Saint Louis Regional Foodshed, can feed ourselves our estimated fruit and vegetable annual consumption on cropland between 11,048.6 and 39,123 acres of cropland if we employ biointensive farming methods. ”

The Farm Bill as it currently stands does not incentivize small organic farms, and does not promote the production of fruits and vegetables. America does not offer a ‘safety net’ for fruit and vegetable growers that is comparable to what it offers for preferred grains. With prices and insurance subsidies incentivizing farmers to grow the commodity crops, mainly corn, wheat, rice, and soybeans, fewer farms in America are producing fruits and vegetables than 80 years ago.

The data show however that we in the Saint Louis Regional Foodshed have the potential to feed ourselves a substantial portion of our diets – and even that of some of our trade partners - with the 9.8 million acres of cropland in our region if we reprioritize the fruits and vegetables needed for a balanced diet full of the micronutrients needed for good health.

Since 1925, acreage designated to fruit and vegetable production in Missouri and Illinois dropped 50% and farmers have disclosed very little data on actual production. Recall that in 2007, farmers in the Foodshed reported less than 10,000 acres of cropland designated to fruits and vegetable production. More research on actual fruit and vegetable production is needed to determine actual fruit and vegetable production levels in the Foodshed.

Healthy soil is important for producing nutrient-rich plants. However, not all farmers implement best management practices for soil conservation and soil health, which is critical for maximum fruit and vegetable production. “Conventional agricultural practices often deplete the soil 8 to 80 times more rapidly than nature builds soil.”⁶⁰ Fortunately, biointensive farming practices “can build the soil up to 60 times faster than in nature,” while reducing the amount of water, fertilizer and energy needed per unit of production, and increasing soil fertility.⁶¹ Using Jeavon’s minimum and maximum biointensive production estimates for the fruits and vegetables with the Saint Louis Regional

Foodshed’s total reported acreage in 2007 and the Foodshed’s estimated total consumption of specific fruits and vegetables in 2009, we, the residents of the Saint Louis Regional Foodshed, can feed ourselves our estimated fruit and vegetable annual consumption on cropland between 11,048.6 and 39,123 acres of cropland if we employ biointensive farming methods. Appendix B lays out the calculations used to determine this range.

With so few of our region’s nine million acres of cropland needed to produce the fruits and vegetables we currently eat, and 94% of our cropland being designated to forage and grain crops, fruit and vegetable self-sufficiency seems within our grasp. Other hurdles, like seasonality, preservation, storage and access to farmland remain. However, sufficient cropland exists to address the bulk of our fruit and vegetable needs. We encourage further research to help reveal the economic impact of supplying more of our fruits, vegetables, grains, meat and dairy needs from local foodshed sources.

Much of the 8.75 million acres growing corn and soybeans in the Saint Louis Regional Foodshed is for livestock feed which leads us to our next set of questions:

How much meat are we producing and how much of it are we consuming?

How much of region’s crops are dedicated to feeding livestock?

Is it the best use of our cropland?

Are we consuming optimal quantities for our health?

Endnotes

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3. Ag 101: Demographics, EPA (June 27, 2012), <http://www.epa.gov/oecaagct/ag101/demographics.html>.
4. Id.
5. Agricultural Electronic Bulletin Board, Average Crop Yields, U.S. and Missouri, 1950-2011, Univ. of Mo., <http://agebb.missouri.edu/mgt/cropyldsmous.pdf> (last visited July 9, 2013).
6. See 2007 Census Publications - State and County Profiles - Missouri, Census of Agriculture, http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Missouri/ [hereinafter 2007 State and County Profiles - Missouri] (follow the hyperlink for each county in the Saint Louis Regional Foodshed to display a summary of the county's agriculture data, including the top five crop commodities); 2007 Census Publications - State and County Profiles - Illinois, Census of Agriculture, http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Illinois/ [hereinafter 2007 State and County Profiles - Illinois] (follow the hyperlink for each county in the Saint Louis Regional Foodshed to display a summary of the county's agriculture data, including the top five crop commodities). MCE gathered top commodity information by selecting each county in Saint Louis Regional Foodshed on Missouri and Illinois maps and following the hyperlink to the selected county's profile, which contained "Top Crop Items (acres)" data.
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11. See 1925 Census of Agriculture - Missouri, supra note 9, at 949; 1925 Census of Agriculture - Illinois, supra note 9, at 534; 1935 Census of Agriculture - Missouri, supra note 10, at 277, 299; 1935 Census of Agriculture - Illinois, supra note 10, at 160, 177; 1954 Census of Agriculture - Missouri, supra note 10, at 131, 141; 1954 Census of Agriculture -- Illinois, supra note 10, at 118, 134; 1964 Census of Agriculture-- Missouri, supra note 10, at 14, 15; 1964 Census of Agriculture-- Illinois, supra note 10, at 14, 15; 1974 Census of Agriculture -- Illinois, supra note 10, at 9, 12-13, 41, 43, 45, 46; 1974 Census of Agriculture -- Missouri,

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12. See 1925 Census of Agriculture - Missouri, supra note 9, at 949; 1925 Census of Agriculture - Illinois, supra note 9, at 534; 1935 Census of Agriculture - Illinois, supra note 10, at 160, 177; 1935 Census of Agriculture - Missouri, supra note 10, at 271, 299; 1954 Census of Agriculture - Illinois, supra note 10, at 134, 142; 1954 Census of Agriculture - Missouri, supra note 10, at 161; 1964 Census of Agriculture - Missouri, supra note 10, at 396, 420; 1964 Census of Agriculture - Illinois, supra note 10, at 358, 370; 1974 Census of Agriculture - Missouri, supra note 10, at 15-18; 1974 Census of Agriculture - Illinois, supra note 10, at 11, 14-16; 1987 Census of Agriculture - Missouri, supra note 10, at 493, 511-16, 523; 1987 Census of Agriculture - Illinois, supra note 10, at 460-66, 471; 2007 Census of Agriculture: Illinois, supra note 8, at 30-31, 33; 2007 Census of Agriculture: Missouri, supra note 8, at 31-32.

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Appendix B:

ESTIMATED CROPLAND ACREAGE OF FRUIT AND VEGETABLES TO FEED THE ST. LOUIS REGIONAL FOODSHED

Acreage Based on Maximum Biointensive Yield Calculations

Fruits and Vegetables	Foodshed acreage, 2007	Lbs./Acre using Maximum Biointensive Yields	Estimated per capita consumption, 2009 (pounds)	Foodshed estimated total consumption (pounds)	Acres Needed to Feed Ourselves Using Maximum Biointensive Yields	Estimated total production with Max. Biointensive Yields (pounds) - approximate yield/acre *number of acres
Asparagus	8	16,552.8	1.3	5,297,143	320.01	132,422
Broccoli (heads)	3	23,086.8	6.1	24,855,823	1,076.62	69,260
Cabbage	1	166,834.8	7.3	29,745,493	178.29	166,835
Carrots (roots)	1	470,448	7.4	30,152,965	64.09	470,448
Cucumbers	164	253,083.6	6.8	27,708,130	109.48	41,505,710
Head Lettuce	1	130,680	17.1	69,677,798	533.19	130,680
Onions	NA	235,224	19.3	78,642,193	334.33	-
Peas - fresh	NA	46,173.6	4.1	16,706,373	361.82	-
Peppers, Green	56	85,813.2	9.4	38,302,415	446.35	4,805,539
Potatoes	56	339,768	36.4	148,319,990	436.53	19,027,008
Pumpkins (whole)	791	83,199.6	0.6	2,444,835	29.39	65,810,884
Snap Beans	51	47,044.8	1.6	6,519,560	138.58	2,399,285
Sweet corn (ears) - shelled wet	807	29,620.8	9.0	36,672,525	1,238.07	23,903,986
Sweet Potatoes	6	214,315	5.3	21,596,043	100.77	1,285,891
Tomatoes	279	182,080.8	19.3	78,642,193	431.91	50,800,543
Eggplant	18	71,002.8	0.5	2,037,363	28.69	1,278,050
Garlic	3	104,544	0.3	1,222,418	11.69	313,632
Leaf Lettuce	2	235,224	26.4	107,572,740	457.32	470,448
Brussel Sprouts	NA	61,855.2	0.3	1,222,418	19.76	-
(reg) Spinach	NA	98,010	1.8	7,334,505	74.83	-
Apples	572	43,560	16.4	66,825,490	1,534.10	24,916,320
Grapes	131	39,204	7.9	32,190,328	821.10	5,135,724
Melon (Cantaloupe)	60	63,162	9.3	37,894,943	599.96	3,789,720
Nectarines	1	34,848	1.8	7,334,505	210.47	-
Peaches (freestone)	1,325	33,976.8	2.6	10,594,285	311.81	45,019,260
Pears	16	47,044.8	3.2	13,039,120	277.16	752,717
Plums (regular) [and prunes]	8	24,829.2	0.7	2,852,308	114.88	198,634
Strawberries, June bearing	59	139,392	7.2	29,338,020	210.47	8,224,128
Watermelon	73	139,392	15.3	62,343,293	447.25	10,175,616
Apricots	1	43,560	0.17	692,703	15.90	43,560
Cherries	2	22,216	0.62	2,526,330	113.72	44,431
Total				1,000,304,240.25	11,048.57	310,870,731.60

Acreage Based on Minimum Biointensive Yield Calculations

Fruits and Vegetables	Foodshed acreage, 2007	Lbs./Acre using Minimum Biointensive Yields	Estimated per capita consumption, 2009 (pounds)	Foodshed estimated total consumption (pounds)	Acres Needed to Feed Ourselves Using Minimum Biointensive Yields	Estimated total production with Min. Biointensive Yields (pounds) - approximate yield/acre *number of acres
Asparagus	8	4,138.2	1.3	5,297,143	1,280.06	33,105.6
Broccoli (heads)	3	11,325.6	6.1	24,855,823	2,194.66	33,976.8
Cabbage	1	41,817.6	7.3	29,745,493	711.32	41,817.6
Carrots (roots)	1	43,560.0	7.4	30,152,965	692.22	43,560
Cucumbers	164	68,824.8	6.8	27,708,130	402.59	11,287,267.2
Head Lettuce	1	32,670.0	17.1	69,677,798	2,132.78	32,670
Onions	NA	43,560.0	19.3	78,642,193	1,805.38	-
Peas - fresh	NA	10,890.0	4.1	16,706,373	1,534.10	-
Peppers, Green	56	15,681.6	9.4	38,302,415	2,442.51	878,169.6
Potatoes	56	43,560.0	36.4	148,319,990	3,404.96	2,439,360
Pumpkins (whole)	791	20,908.8	0.6	2,444,835	116.93	16,538,860.8
Snap Beans	51	13,068.0	1.6	6,519,560	498.90	666,468
Sweet corn (ears) - shelled wet	807	7,405.2	9.0	36,672,525	4,952.27	5,975,996.4
Sweet Potatoes	6	35,719.2	5.3	21,596,043	604.61	214,315.2
Tomatoes	279	43,560.0	19.3	78,642,193	1,805.38	12,153,240
Eggplant	18	23,522.4	0.5	2,037,363	86.61	423,403.2
Garlic	3	26,136.0	0.3	1,222,418	46.77	78,408
Leaf Lettuce	2	58,806.0	26.4	107,572,740	1,829.28	117,612
Brussel Sprouts	NA	30,927.6	0.3	1,222,418	39.53	-
(reg) Spinach	NA	21,780.0	1.8	7,334,505	336.75	-
Apples	572	21,780.0	16.4	66,825,490	3,068.20	12,458,160
Grapes	131	19,602.0	7.9	32,190,328	1,642.20	2,567,862
Melon (Cantaloupe)	60	13,068.0	9.3	37,894,943	2,899.83	784,080
Nectarines	1	17,424.0	1.8	7,334,505	420.94	17,424
Peaches (freestone)	1,325	16,988.4	2.6	10,594,285	623.62	22,509,630
Pears	16	15,681.6	3.2	13,039,120	831.49	250,905.6
Plums (regular) [and prunes]	8	8,276.4	0.7	2,852,308	344.63	66,211.2
Strawberries, June bearing	59	17,424.0	7.2	29,338,020	1,683.77	1,028,016
Watermelon	73	217,800.0	15.3	62,343,293	286.24	15,899,400
Apricots	1	10,890.0	0.17	692,703	63.61	10,890
Cherries	2	7,405.2	0.62	2,526,330	341.16	14,810.4
Total				1,000,304,240.25	39,123.27	106,565,619.60