

# WEEKLY NEWS ARTICLE UPDATE



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## Export Sales Highlights

This summary is based on reports from exporters for the period August 26-Sept 1, 2016.

**Soybeans:** Net sales for the 2016/2017 marketing year, which began September 1, totaled 1,776,800 MT. Increases were reported for China (843,300 MT, including 129,000 MT switched from unknown destinations and decreases of 12,200 MT), unknown destinations (746,500 MT), Bangladesh (60,000 MT), and Canada (54,100 MT). Net sales of 8,000 MT for 2017/2018 were for Costa Rica. A total of 1,989,800 MT in sales were carried over from the 2015/2016 marketing year, which ended August 31. Exports for the period ending August 31 of 1,017,900 MT brought accumulated exports to **50,839,200 MT**, up 2 percent from the prior year's total of 49,801,300 MT. The primary destinations were China (362,200 MT, including 181,500 MT switched from unknown destinations and decreases of 5,600 MT), the Netherlands (228,900 MT, including 210,000 MT switched from unknown destinations), Saudi Arabia (72,200 MT), Indonesia (70,400 MT, including 49,100 MT switched from unknown destinations and decreases of 100 MT), and Portugal (67,400 MT). Exports for September 1 totaled 228,300 MT, with China (222,500 MT), Indonesia (3,500 MT), Japan (1,100 MT), and Malaysia (400 MT) being the primary destinations.

*Optional Origin Sales:* For 2015/2016, the current optional origin outstanding balance is 120,000 MT, all China, and was carried over to 2016/2017. For 2016/2017, the current outstanding balance is 120,000 MT, all China, including carry-over.

*Exports for Own Account:* The current exports for own account outstanding balance is 500 MT, all Canada.

**Soybean Cake and Meal:** Net sales of 63,000 MT for 2015/2016 were up noticeably from the previous week and 3 percent from the prior 4-week average. Increases were reported for Venezuela (17,000 MT), the Dominican Republic (14,300 MT), Japan (12,700 MT), Mexico (10,300

MT), and Guatemala (6,000 MT, switched from unknown destinations). Reductions were reported for unknown destinations (17,100 MT), Colombia (600 MT), and Jamaica (200 MT). For 2016/2017, net sales of 54,400 MT reported primarily for Thailand (17,000 MT), the Dominican Republic (16,100 MT), Mexico (7,400 MT), and Colombia (4,900 MT), were partially offset by reductions for Japan (1,600 MT). Exports of 104,300 MT were down 41 percent from the previous week and 20 percent from the prior 4-week average. The primary destinations were Venezuela (25,900 MT), Mexico (22,200 MT), Nicaragua (9,800 MT), Jamaica (9,800 MT), and Guatemala (9,100 MT).

*Optional Origin Sales:* For 2015/2016, the current optional origin outstanding sales balance is 36,000 MT, all unknown destinations.

**Soybean Oil:** Net sales of 3,500 MT for 2015/2016 were up noticeably from the previous week, but down 29 percent from the prior 4-week average. Increases were reported for Mexico (3,200 MT), and Canada (100 MT). For 2016/2017, net sales of 900 MT were reported for Mexico. Exports of 8,400 MT were down 33 percent from the previous week and 32 percent from the prior 4-week average. The primary destinations were Mexico (8,000 MT), Canada (100 MT), and Trinidad (100 MT).

USDA's complete export sales data can be found at this website: <http://apps.fas.usda.gov/export-sales/esrd1.html>

#### **COLUMN-China Imports Will Keep U.S. Soybean Market on Its Toes -Braun**

(Karen Braun is a Reuters market analyst. Views expressed are her own. Repeats for wider distribution.)

By Karen Braun

CHICAGO, Sept 9 (Reuters) - When it comes to assessing demand for U.S. soybeans, never underestimate the Chinese.

China's penchant for the oilseed has mushroomed in recent years, complementing growth in the country's livestock sector, particularly pork. As the world's largest soybean consumer, China will use over 40 percent more soybeans than the world will have in storage next year.

The United States just began its 2016-17 soybean marketing year, and China will have a big say in how much supply is left over at the close of next August.

The increasing likelihood of a record-large soybean crop in the United States, one of China's key suppliers, may have at least temporarily masked some of the risk to the domestic balance sheet.

Analysts expect U.S. soybean production to increase in Monday's U.S. Department of Agriculture supply and demand report, but they expect 2016-17 ending stocks to remain relatively unchanged near 330 million bushels.

Although this reflects that huge yields will be offset by increasing demand, there is the potential for demand to pull U.S. soybean inventory even lower throughout the next year if China's recent habits remain the same.

#### CHINA BY THE NUMBERS

In 1996-97, China imported just over 2 million tonnes of soybeans and a decade later this figure had climbed to 29 million tonnes.

The U.S. Department of Agriculture has projected China to import 87 million tonnes in the 2016-17 marketing year, which will begin on Oct. 1. This is the equivalent of 3.197 billion bushels, and for comparative purposes, the United States produced 3.929 billion bushels of soybeans last year.

To put China's massive soybean demand trend into perspective, the East Asian country now accounts for nearly two-thirds of the world's imports of the oilseed. When subtracting China from the mix, the global soybean import trend over the past 20 years is practically rendered flat.

As the world's two biggest soybean producers, the United States and Brazil are naturally China's primary suppliers. Over the last couple of years, the two countries have been responsible for 85 to 90 percent of China's total soybean imports.

Not surprisingly, China buys the majority of soybeans that Brazil and the United States export. In 2014-15, some 72 percent of Brazil's shipments were imported by China, and the corresponding figure for the United States was 59 percent.

The United States supplies the first half of China's marketing year while Brazil takes over the second half. Peak soybean shipments from the United States to China occur around December, and Brazil will peak between April and May (<http://reut.rs/2c93QmK>).

#### LITTLE INCREASES ARE HUGE

In May 2014, the U.S. Department of Agriculture placed Chinese soybean imports for the new 2014-15 marketing year at 72 million tonnes. At the conclusion of the season in late 2015, China had actually imported 78.35 million tonnes.

In May 2015, the initial estimate for the nearly completed 2015-16 year was 77.5 million tonnes. As of last month, USDA expected that China will import 83 million tonnes of soybeans in the current marketing year.

The lesson? China's soybean appetite seems limitless, as its annual imports have been significantly underestimated in the past two years.

The difference in the initial and final Chinese soybean import figures from 2014-15 was 233 million bushels, very close to the 255 million bushels that the United States is estimated to have left over after its recently concluded 2015-16 marketing year.

China may not reach 83 million tonnes in 2015-16, though, as Shanghai-based analyst JC Intelligence Co Ltd (JCI) said on Thursday that September soybean imports may fall below 6 million tonnes.

This would be well below last September's 7.3 million tonnes.

Through August, China has imported 76 million tonnes of soybeans. But even an optimistic assumption of 6 million tonnes imported during September would land the final volume about 6 percent higher than the initial assumptions - a difference of 165 million bushels.

The brief slowdown in imports should be only temporary, according to JCI. Chinese demand for U.S. soybeans received a boost last week as a delegation of buyers signed agreements to purchase nearly 4 million tonnes at a signing ceremony in Indianapolis.

In the United States, about 41 percent of the expected soybean export volume for 2016-17 has been booked through Aug. 25. This rate is very comparable to previous years and implies that U.S. soybean shippers are about to get pretty busy in a couple of months, especially if sales continue on a strong course.

Maybe it is hard to imagine that China's potential 87 million-tonne haul could edge much higher over the next year or so, but then again, it was probably difficult to fathom a volume over 30 million tonnes just a decade ago.

Of course, Brazil's harvest early next year will be crucial in just how much of the oilseed China can acquire, as well as the timing and the source. But the United States will take the leading role in supplying China with soybeans for at least the next six months, and it is a good idea to pay attention because increasing Chinese demand could cut down U.S. supply in a jiffy.

#### [USDA Data Show Organics Average 67% of Yield of Non-Organics](#)

Terry Daynard's Blog |

Widely diverse information exists on the size of the yield penalty associated with organic crop production. Some authors/spokespersons – often connected with organic production/marketing – claim organic yields are typically 80-100% of non-organic. (I prefer the term “non-organic” over “conventional,” because so much of modern agriculture is anything but conventional.) Other sources say 50-70% is more common.

One might ask, “Why does this matter?” Just let farmers grow what they believe they can grow profitably, sorting out yield and price-premium relationships for their individual farms, crops and market environments. And if profit expectation is too low relative to risk and management needs, then organic buyers can raise the price to stimulate production – or import organic produce from afar – just as occurs with any other farm commodity.

But the question is often voiced in more fundamental terms. Many in organic production/marketing/advocacy portray organic as morally superior and more sustainable, notwithstanding some small reductions in yield. Others argue the reverse: that organic agriculture is bad ethically because of markedly lower yields and the attendant major increase in land needed to produce food.

There is more to sustainable agriculture than yield. Quality is important and so too are the long-term adequacy of input needs, energy usage and effects on environment. Organic may or may not be

environmentally superior; it depends on which analysis, commentary or assumptions you read or use. But yield is highly important too.

Thus it was with pleasure that I read a quality analysis published in August 2016, by Drs. Kniss and Jabbour at the University of Wyoming and Dr. Savage in San Diego. It's entitled, "Commercial Crop Yields Reveal Strengths and Weaknesses for Organic Agriculture in the United States." A popularized column based on the paper was published simultaneously by Kniss. The strength of the paper is that, unlike any before, it is based on many thousands of actual on-farm records. The paper involves data only from the United States but it's a major contribution and you must read it – ideally both the paper and column.

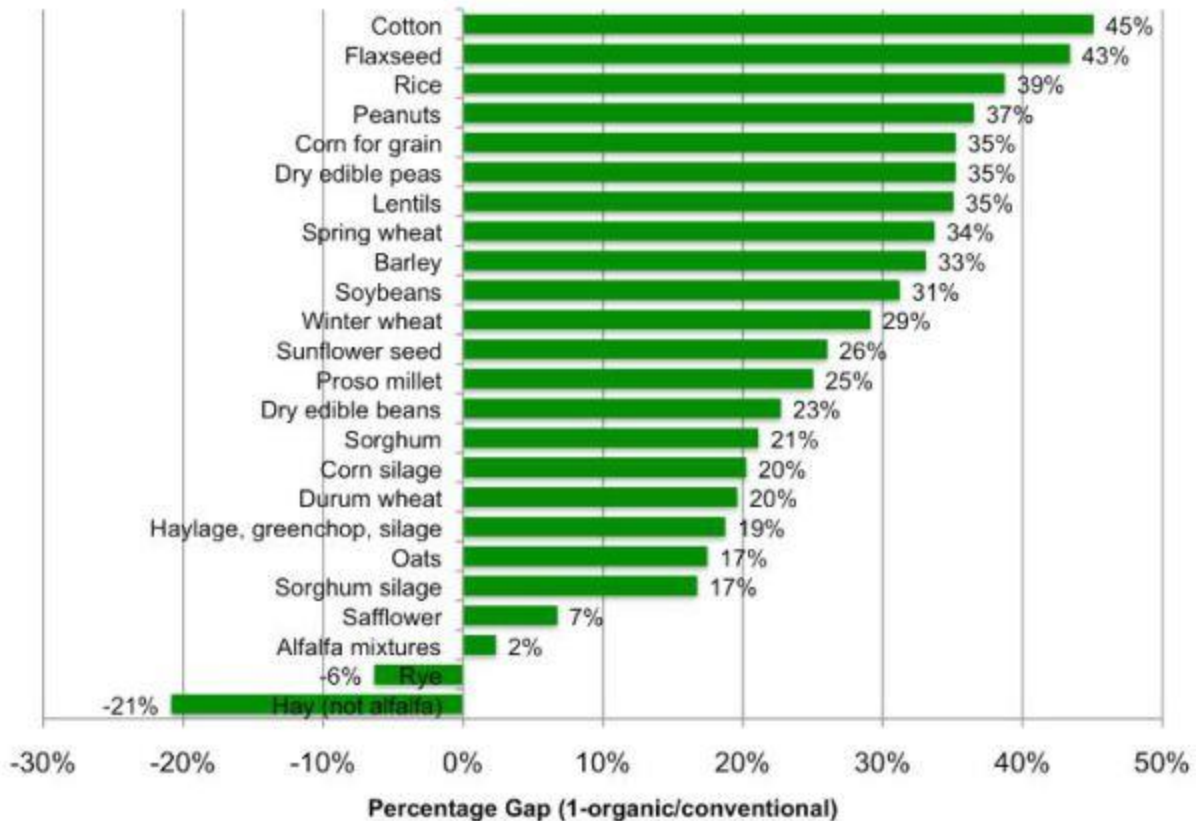
The following consists of a few comments on their analysis and will make more sense if you have some knowledge of what Kniss et al have written.

In briefest terms, the authors compared yield data provided for the year 2014 through a special USDA survey of more than 10,000 organic growers, with similar yield data collected for all US crop farmers through the 2014 USDA-NASS December Agricultural Survey. They found that organic crops normally yield less than non organic but with a huge range in yield ratios across crops and across states. Notable exceptions are hay and haylage crops where organic crops yield as much or more – and up to 60% higher for haylage. On average, Kniss et al concluded that organic crops average 80% of non-organic.

I had serious doubts about both the 60% and 80% numbers and contacted the authors asking questions and providing further calculations using their data. I am pleased that the errors have been corrected. The stats properly show that organic haylage yielded 76% as much as its non-organic counterpart, on average. The average yield ratio (organic/non-organic) for all 65 crops included in their analysis is now 67%. Worded otherwise, 1.5 acres of land in organic production is needed, on average, to produce as much food as 1 acre of non-organic land, according to the USDA survey.

With the corrections, the Kniss et al paper produces results equivalent to those published by co-author, Steve Savage, one year ago. Here's one graph from Savage's web site for row crops. (Savage reported the organic yield gap as percent lower yield, rather than as a percent of non-organic crop yield as preferred by Kniss et al.) The Savage web site contains similar graphs for a range of other crops.

## Organic Yield Gaps For US Row Crops 2014



The yield depression for organic corn and soybeans is similar to that reported by crop insurance officials for those crops in Ontario. However, the yield depression is greater with organic winter wheat in Ontario (an average of 42% lower over eight years) than shown in the USDA data.

The authors highlight a conclusion in the USDA organic report that 40% of organic farmers reported using no-till or minimum tillage practices. Observing organic practices in Canada, I simply don't believe this statistic and think it is a result of a USDA survey process which involved self-reporting. Vast numbers of farmers in North America likely believe that they practice "minimum tillage" – with "minimum" generally meaning less than what they did in times past or less than what they might have done. I am aware that organic researchers and some farmers are experimenting with no-till seeding using crimped cover crops to control weeds (with mixed success). But this still represents a minute percentage of total organic acreage.

Kniss et al cast doubt on claims that high-yield agriculture allows land to be diverted out of arable crop agriculture into conservation or other purposes. They cite a 2014 US report showing a decline in number of acres in the US land conservation reserve in years after 2007. In my view, any meaningful analysis of the effects of yield enhancement on land usage has to include a much longer time frame.

The acreage numbers show effects of poor crop prices in the mid 1980s, good prices around the year 1996 and after 2007, as well as anomalies such as the US "PIK" land set-aside program of 1983.

However, the overall trend in principal crop acreage is down. For those statistically inclined, the slope of the linear regression line is -490 thousand acres/year with  $R^2 = 0.24$  and  $P < 0.01$ . Some that diverted land went into urban development for sure, but I expect much was land conversion into non-cropped rural landscape. Principal crop acreage declined even as usage for both food and non-food uses (biofuels and biomaterials) grew.

A final comment: It's a common practice for some organic farmers to plow under a soil-building crop (for example, perennial legume or buckwheat), without harvesting, in year one to provide better growth for the crop in year two. When that's the case, the harvested crop is actually the product of two years of growth and the reported yield per acre should be halved to calculate yield/acre/year. This adjustment is not included in the USDA data and I expect no one knows how large the adjustment should be. That factor does mean that the 67% is a slight over-estimate. (The same practice can occur in non-organic agriculture, though I believe to a smaller extent.)

With that noted, I do compliment the authors on an excellent and highly useful paper containing farm-level stats on the performance of specific crops.

And from a practical standpoint, it is likely more important for farmers to know that they might expect hay yields (though not haylage) comparable to non-organic with organic production, but corn, soybean and wheat yields which are 30-35% lower, and organic grape yields 50% lower – than it is to know what the US average is for all crops is 67% or whatever. Yield data for all 65 crops are contained in supplementary tables in the Kniss et al paper.

#### [Farmers: August Rains May Hurt Harvest](#)

Chicago Tribune, 07-Sep-2016

Larry Christiansen's soybeans are suffering from "wet feet."

Christiansen, who farms in the far south and southwest suburbs, sees that his beans are turning yellow prematurely, a symptom of too much rain over too short of a period, making the plants more susceptible to mold and fungus.

"It's hurting the crop, no doubt about it," Christiansen said of the rain.

Generally, rain in August is a good omen for soybeans, but, as with any crop, too much and it becomes a problem.

Local agricultural experts said heavy rains that have left many fields flooded could cause some crop damage but that it is still too soon to tell how widespread that damage might be.

With farmers not expected to begin harvesting until later this month, a period of drier weather would be a welcome change.

If wet weather persists, "it is going to be a problem for some farmers to get equipment through their fields," Bill Johnson, an agriculture professor at Joliet Junior College, said. "If it doesn't rain a tremendous amount more, we will be OK."

To the north of where Christiansen farms, Mike Kestle, in New Lenox, showed soybean pods with four beans in them, more than the typical two or three beans per pod. He said he expects record yields this year.

While overall rainfall in the Chicago area during August was slightly above normal, some areas got double the typical amount, according to the National Weather Service. August rainfall totals between 5 and 8 inches were widespread across the far south and southwest region, according to the weather service.

Corn standing in flooded fields can suffer from stalk rot, with the plants at risk of simply toppling over if a storm rolls through, said Johnson, who teaches courses such as agricultural economics and farm management. The stretch of warm and humid weather during much of the month can also worsen conditions for various types of diseases that can damage or kill beans, he said.

Just a small percentage of corn, and none of the soybean crop, was deemed ready for harvest this week in the most recent government survey, Johnson said, so it might not be until late this month before farmers begin cultivating, giving fields more time to dry.

Weeds are a greater concern for Jeff Haas in Homer Glen. He said the excessive rains are "generating a lot of weed seed for next year."

"These guys are getting tough to control," said Haas, who grows soybeans and corn.

For hay farmers, like Janet McCabe in unincorporated Palos Township, the rain has delayed the second cutting. A typical hay season has three cuttings, and so far the McCabes have cut only once. The process requires three days of sunny, dry weather in order to cut, dry out and then bale. If the humidity is too high, hay will mold.

McCabe said the crop has not gotten to the point where the quality has been affected.

"Compared to last year, it was very, very delayed, and we only got two cuttings," she said.

All the farmers said they will not know to what extent rain has hurt their crops until the harvest is done and yields are measured.



Mark Schneidewind, manager of the Will County Farm Bureau, said the bureau has gotten some reports of crop damage due to standing water in fields, but it's unclear at this point what the extent of damage might be.

He said it will "take a good seven to 10 days" of dry conditions in order for farmers to get equipment into their fields, but that no harvesting is likely to start until the middle of this month at the earliest.

Statewide, reports suggest a record year for soybeans and possibly matching the best crop ever for corn, Johnson said.

The most recent crop progress report showed that just 7 percent of corn statewide was at maturity, compared with a five-year average of 16 percent at this point in the growing season, he said. That same report showed no beans were yet ready for harvest.

Johnson said it might not be until the end of the month that sufficient corn will be ready for harvest. Also, farmers, whether they sell the corn or store it, will need to dry it, and the excess moisture could mean leaving it in the field a bit longer to dry rather than incurring the extra cost of drying the crop after it's harvested, he said.

### [Argentina Biodiesel Exports Surge Despite EU Anti-Dumping Duties](#)

07-Sep-2016

Argentina's biodiesel exports could increase by up to 80% in 2016 from a year earlier, to 1.4 million tonnes, thanks to growing sales to the United States, industry representatives said.

Argentina is a leading exporter of the biofuel but shipments have lagged in recent years because of anti-dumping duties imposed by the European Union.

Exports to the United States helped compensate for lost exports to the EU this year after the United States altered rules for importing biofuel from Argentina.

"The increase in the Argentine biofuel exports have been notable. If they continue at this rate (global) exports could reach some 1.4 million tonnes," said Claudio Molina, executive director of the Argentine biofuel's association.

Last year Argentina exported just 800,000 tonnes. In just the first half of 2016, exports reached 590,000 tonnes.

According to the Argentine chamber of biofuels, which counts global companies like Cargill and Bunge as members, exports will likely reach 1 million tonnes in 2016, with between 75 and 80 percent going to the United States.

"The companies had to adjust their certification systems and were more prepared after the first quarter," said Victor Castro, executive director of the chamber, known as Cambio.

Biodiesel exports from Argentina nearly tripled in the second quarter of 2016 from a year earlier, official data released last week showed.

The US Agriculture Department expects exports to the United States to total 1.3 billion litres in 2016. A year earlier, before the certification change, it had forecast 750 million litres.

Still, the industry faces challenges.

Peru, the second market for Argentine biodiesel after the United States, is evaluating whether to follow the European Union in applying anti-dumping duties, Argentine industry sources said.

Biodiesel exports have a 5% export tariff in Argentina while exports of soy, the material used in most biodiesel, are charged 30%. The EU and Peru believe the difference is unfair.

"Peru is an important destination for Argentina, if duties are applied it would be a new blow to the industry," said Carbio President Luis Zubizarreta.

He said exports to the European Union could restart next year, after the World Trade Organisation ruled in favour of several claims by Argentina over the EU in March, although the EU appealed the decision.

"By the end of the year we hope to have started negotiations to open the market in the first months of 2017," he said.

[Column: When Industrial-Scale Farming is the Sustainable Path](#)

Miriam Horn

[PBS NewsHour](#) |

**Editor's Note:** In her new book "[Rancher, Farmer, Fisherman: Conservation Heroes of the American Heartland](#)," published Sept. 6, Miriam Horn follows five people whose forward-looking practices sometimes defy widely held beliefs about sustainability and farming. Below, Horn pulls from the story of Justin Knopf, a farmer in central Kansas, to show that industrial-scale farming — and yes, even the pesticides that come with it — can be sustainable.

Justin Knopf farms 4,500 acres in central Kansas, producing wheat, soy, sorghum and alfalfa for national and global markets, using synthetic pesticides, fertilizer and GMOs. In some quarters, those facts would suffice to condemn him as a villain of “Big Ag.” But Justin is a conservation hero, showing the way to restore soils and biodiversity, protect clean water and the atmosphere and feed a growing global population without giving over still more of the planet to agriculture — which already covers half of Earth’s ice-free land, uses 70 percent of all fresh water and has greater impacts on biodiversity than any other human enterprise.

Working with his dad and brother on land homesteaded by his maternal great-grandparents just after the Civil War, Justin grew up hearing how his grandmothers put wet tea towels in windows to try to keep out the black blizzards of the Dust Bowl. Given responsibility for several fields while still in high school, he’d watched his own soils blowing and washing away, weeds running out of control and paltry yields. But it wasn’t until he went off to Kansas State University that he understood a prime cause of that damage: generations of plowing.

Though few landscapes appear more beautiful, fertile and orderly than the straight, black, fragrant furrows of a newly tilled field, plowing is unnatural and, in many climates and soils, one of the most destructive things a farmer can do. Plowing strips soil bare, exposing it to erosion by rain and wind. It collapses soil structure — closing off the water channels left by deep roots and worms — and harms life in the soil, which though it may appear dead is in fact Earth’s most biodiverse ecosystem, containing a third of all organisms. Those thousands of microbial species are critical to human survival. They sustain photosynthesis, which all food and oxygen come from, by ferrying nutrients to plants and protecting them from pathogens. They decompose wastes, turning corpses of plants and animals back into new life. They’re also directly vital to human health, the source of 90 percent of antibiotics and 60 percent of anticancer drugs.

But plowing scrambles soil communities, separating and disordering symbiotic partners. Turning crop residues under disorders them further: crowding out valuable fungi by overstimulating bacterial growth. Those bacteria eat the soil carbon and breathe it into the atmosphere, turning it from essential nutrient to destructive greenhouse gas.

So Justin gave up tilling and persuaded his dad and brother to “no-till” too. For 20 years, mimicking the surrounding prairie, they’ve left their soils undisturbed and littered with a protective mat of stalks, husks and leaves. They’ve also applied the innovations of “precision agriculture” to minimize added nitrogen and introduced ever more diversity: planting mixed “cover crops” (which they never harvest, but leave to shelter and nourish the soil), intensifying their rotations and beginning to add buffers at field edges of flowers and milkweed for pollinators. Undisturbed soil stores carbon rather than releasing it into the atmosphere. Careful nitrogen use prevents release into the atmosphere of nitrous oxide, another powerful greenhouse gas, and harmful run-off into rivers, lakes and coastal waters. And diverse plantings support diversity both above ground — of grassland birds, beneficial insects and prairie mammals — and below, where a complex web of microbes depend on one another not only for survival, but also to provide together functions like immunity to crops that none can provide alone.

Plowing is unnatural and, in many climates and soils, one of the most destructive things a farmer can do.

And here's where the simple verities about good versus bad farming turn out to be neither simple nor always true. Justin uses his residues, cover crops and rotations as his first line of defense against pests: preventing weeds from gaining a foothold and confusing insects. But he still needs to "burn down" those cover crops to enable planting and to beat back tenacious weeds. For both, he turns to Roundup, an infamous synthetic herbicide.

The concerns about Roundup — and the crops engineered to resist it — are well-founded: the combination has been wildly overused, enabling vast monocultures and breeding resistant weeds. Most organic farmers make the opposite choice: avoiding chemical herbicides by tilling. But most soil microbiologists believe that causes *greater* ecological harm. "If you till to avoid herbicides, you do massive damage to soil microbiology," says Justin's mentor, Kansas State soil microbiologist Charles Rice. If herbicide, used judiciously, "allows you to leave the soil intact, it is a net environmental positive. We have fields that have been in continuous no-till for 22 years, using herbicides, with ever more microbial diversity and life."

That flowering is evident in Justin's soils. His fields are increasingly (like the prairie) self-contained: holding soil, water and nutrients in place and building organic matter, fertility and biodiversity where it counts the most: underground. Among those who regularly track his progress is Dr. Ray Ward, a legendary soil scientist who runs a private testing lab in Nebraska. Ward has charted a steady microbial renaissance in Justin's soils: in total mass, diversity and vigor. Justin's soil carbon, depleted to near zero by generations of plowing, is now more than halfway to the 4 percent carbon levels in native prairie soils. With another decade or two of no-till, says Rice, Justin will close that gap.

Agriculture can't be formulaic or dogmatic because, as Justin says, "diverse ecosystems require diverse practices."

Justin is also, crucially, maximizing the nutrition produced per every acre, drop of water and pound of greenhouse gas emitted, as anyone who displaces native species has an obligation to do. No matter how ecologically sensitive a farm might be, growing crops where there was once prairie or hardwood forest unavoidably comes at the cost of species that once lived there and of the "services" those ecosystems performed, like cleaning water and air.

High-yield farms, like cities, concentrate that human footprint. Low-yield farms, like suburbs, exact a far-flung, profligate price. Many small and organic farmers do maximize productivity, especially those that layer crops and integrate animals. But every farmer and even backyard gardener needs to ensure that whatever bit of forest or meadow they've sacrificed is well repaid in nutritious food. And for crops like wheat, it will almost certainly make sense to concentrate production in regions like the American Midwest, where the grain's close kinship to indigenous prairie grasses means that it can live in harmony with (rather than disrupt) the native ecology. It is because Justin grows grasses in a grassland that he can — *through* that intensive production — rebuild his soils and nurture several thousand species of co-inhabitants.

There are, in short, no simple, perfect, universal answers. Agriculture can't be formulaic or dogmatic because, as Justin says, "diverse ecosystems require diverse practices." He sees, for instance, "crops and geographies and family circumstances where no-till is not the right solution," including in very cool and poorly drained soils where under thick residues the soil can never dry or warm enough to germinate seeds.

Big, heartland, mainstream production is where meaningful change will have to happen if sustainability is to become business as usual.

Instead, there are only the best (and provisional) imperfect ways, which can be arrived at only by facing the trade-offs head-on. Consumers also need more meaningful measures like: how does the biodiversity and carbon content in this farmer's soil measure up against the native landscape? Whole Foods is trying to move toward such measures; by 2018, they will classify produce as good, better or best based on soil health, water conservation, biodiversity and greenhouse gas emissions. Wal-Mart, too, the nation's largest grocer, has asked its suppliers to source grains from farmers using practices like Justin's to reduce their greenhouse gas emissions. Applying such measures will undoubtedly spur still more diversity — of farm size, practices and markets, including farm to table.

But big, heartland, mainstream production is where meaningful change will have to happen if sustainability is to become business as usual, transforming not only niche markets, but the entire food supply chain as well. And it's where meaningful change *is* happening. Justin is not an outlier, but part of a large and growing movement across the heartland states: not just to minimize the damage done by large-scale food production, but to use big, intensified agriculture as itself a path to restoring soil life and a stable climate.

Miriam Horn is the author of "Rancher, Farmer, Fisherman: Conservation Heroes of the American Heartland." She works at the Environmental Defense Fund and previously worked for the U.S. Forest Service. Horn has spent 15 years writing for numerous newspapers and magazines, including the New York Times, U.S. News and World Report, Smithsonian and Vanity Fair.