The No-Till Revolution

A Storied Timeline (Through 2021)

With more than 75 new updates, this historical record identifies what built no-till into a profitable farming practice now embraced on 110 million U.S. acres.

A No-Till Farmer Staff Report

Success with no-tillage – a radical change in farming from conventional methods – was anything but assured when it got its commercial start 60 years ago. But success came, thanks to the vision, courage and dogged determination shared by many – and from every corner imaginable.

Many of no-till's proponents risked their reputations by attaching their names to no-tillage. (Our founder, Frank Lessiter, who has edited every issue of *No-Till Farmer* since its inception in 1972, was one of them.)

Plowman's Folly by Edward Faulkner (who picked a fight with the moldboard plow and those who used it) and Harry Young Jr.'s commercial no-till plot in Kentucky in 1962 often get the lion's share of the spotlight for no-till history. But credit for no-till's advancement can't be summarily distilled in a few pithy sentences or citations.

Ingenuity and an "against the grain" perseverance are omnipresent in the "no-till story." The growth of no-till was driven by many factors, from the testing and perfecting of new chemical formulations … To the researchers and extension agents who ignored their administrators and tirelessly studied and learned the practice … To the salesmen who quelled their doubts upon hearing one "no" after another … To those who assembled the groups and associations, workshops and field days.

But most important are the farmers in this movement. We salute them for their by-necessity farm-shop innovations, and for subjecting themselves to ridicule for their "ugly, lazy ways of farming."

It was farmers' willingness to share successes and failures that was so critical to transferring that know-how to the next curious farmer embarking on a no-till journey. We can't take for granted how unique this element has been in no-till's story – competition, ego and embarrassment were set aside for the greater good.

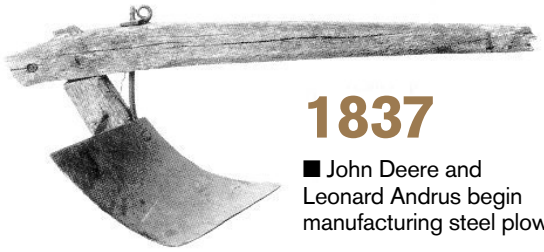
Hundreds – if not thousands – of victories had to continually compound upon another for no-till to claim 110 million acres in 60 years. The following pages serve to permanently record the key developments in no-till's timeline, gleaned from 5 decades of *NTF*.

Yet what's more exciting is what still lies ahead – and with the tools, technology and science now available. If farmers over the next 60 seasons can harness even a portion of the spirit of those of the first 60, no-till's future will be bright indeed.

This timeline will reside as a "living document" at www.No-TillFarmer.com/historytimeline. Should you see an important milestone that we've missed, use the comment field to let us know.

1830

■ 250-300 labor hours are required to produce 5 acres of wheat with a walking plow, harrow, hand broadcast of seed, sickle and flail.



1837

■ John Deere and Leonard Andrus begin manufacturing steel plows.

"Imagine how different things would've been for agriculture had John Deere been a chemist instead of a blacksmith? And instead of inventing a self-scouring steel plow, he'd invented Roundup …"

– Randall Reeder, Retired Extension Agricultural Engineer, Ohio State Univ.

1862-75

■ Change from hand work to horses characterizes the first American agricultural revolution.

1926

■ Irish mechanic Harry Ferguson patents the three-point linkage, or hitch, for farm tractors in Britain.

1930

■ 15% of U.S. farms have adopted the tractor.

1935

■ The "father of soil conservation," Dr. Hugh Hammond Bennett, delivers a highly publicized testimony on soil conservation. With a dust storm traveling from the bare fields of the Great Plains all the way to Washington, D.C., Bennett stalls his testimony until the dust clouds darken the sky over the U.S. Capitol. The Senate unanimously passes legislation to create the Soil Conservation Service, a permanent agency under USDA.

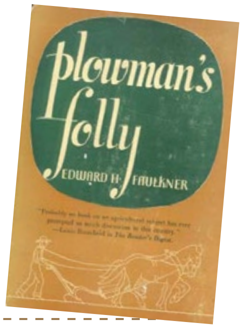
■ The National Soil Dynamics Lab is established at Auburn, Ala., as part of USDA's Agricultural Research Service. Conceived by Mark Nichols and John Randolph, the full-size laboratory studies the relationship between tillage tools, traction equipment and soil types.

■ In response to the extreme soil drifting in Western Canada, Alberta's Charles Noble develops a system to shear stubble and weeds below the ground and leave the residue on top of the soil to reduce evaporation and prevent erosion.

■ Agronomists Frank Duley and Jouette Russell at the Univ. of Nebraska, along with other scientists with the U.S. Soil Conservation Service, begin research into conservation tillage to control wind erosion and manage crop residue.

1943

■ *Plowman's Folly*, authored by Edward H. Faulkner (an agricultural agent in the Upper Ohio and Erie Basins), is released. "No one has ever advanced a scientific reason for plowing," the book asserts. "The hottest farming argument since the tractor first challenged the horse was started by Faulkner's attack on the moldboard plow," reports *Time Magazine*. The idea that seeds can be planted directly into residues from the previous crop motivates a soil conservation movement in the U.S. that would eventually take the form of no-till.



1944

■ Purdue Univ. conducts the first row-crop tillage-planting experiments for leaving crop residue on the surface of the soil to control erosion. Project is initiated by Ag Engineer R.R. Poyner and Agronomist Helmut Kohnke, both of Purdue, and USDA's R.B. Hickok.

■ Leonard Fleischer develops the first ridge-till equipment and establishes Fleischer Mfg. in Grand Island, Neb.

1951

■ K.C. Barrons and his team of researchers at the Dow Chemical Co. report on the successful application of no-tillage techniques.

1945

■ The amount of tractor power overtakes horsepower for the first time on U.S. farms.

■ At the end of World War II, Dow releases 2,4-D for use in the control of broadleaf weeds, presenting the first real possibility of cultivating crops without tillage on large-scale farms.

1953

■ Based on R.R. Poyner's patent, IH produces the first commercial no-till planter, the McCormick M-21 (2-rows on 40-inch spacing) at its Richmond, Ind., plant. The lack of weed control products at the time thwart its success, and IH ceases production after 2 years. Only 23 of 50 units produced were sold.

1947

■ Iowa farmer Ray Hagie invents the first self-propelled sprayer. This development would prove key to no-tillers who needed timely application on ever-increasing acreages.

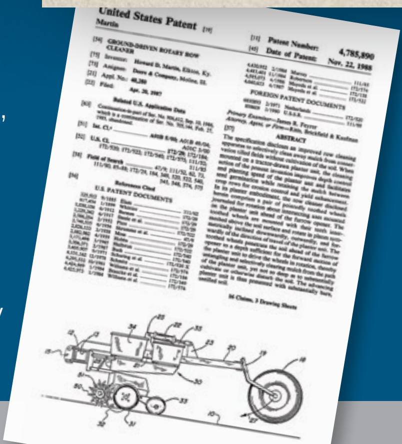
1955

■ The invention of the herbicide paraquat in the U.K. starts the modern no-tillage development in Europe and worldwide. This discovery leads the Imperial Chemical Company to initiate research into farming without tillage.

Martin-Till

1986

Howard Martin, Elkton, Ky., files a patent for the first ground-driven row cleaner for no-till planting, to push the residue aside so the soil would dry faster, be warmer and improve stands. He began manufacturing the row cleaners in 1991, which immediately extend the planting days available for no-tillers.


United States Patent [19]
Martin
[11] Patent Number: 4,785,890
[45] Date of Patent: Nov. 22, 1988
[54] GROUND-DRIVEN ROTARY ROW CLEANER

1991

Started manufacturing original pin adjust with 15-in. wheel in a 30 x 36-ft. farm shop.

1961

■ Univ. of Illinois agronomist George McKibben establishes plots in Dixon Springs, Ill., to begin no-till research.

■ John and Jake Kirschman build the original SpraCoupe sprayer in their North Dakota workshop, with features that outperform tractor-mounted spray booms in numerous ways. Rights and design are eventually purchased by Melroe, Clark Equipment, Ingersoll Rand and then AGCO.

1962

■ Harry Young is the first in the U.S. to use no-till on commercial farmland. He modifies a mule-drawn 2-row planter to no-till corn on 7/10s of an acre in Herndon, Ky.

■ Ohio State Univ. (OSU) establishes plots in Wooster to determine how much, if any, tillage is needed to obtain satisfactory crop yields. They are continuously operated and known today as The Triplett-Van Doren No-Tillage Experimental Plots.

■ With West Tennessee farmers losing 40 tons of soil per acre annually, the Univ. of Tennessee AgResearch and Education Center at Milan opens.

1963

■ Eugene Keeton demonstrates the finger pick-up seed meter for planters and then sells the design to John Deere.

1966

■ Allis-Chalmers introduces the first fluted-coulter no-till planter.

■ Chevron Chemical releases paraquat in the U.S. for use as a burndown herbicide and to eliminate weedy plants in wheat fields.

1967

■ No-till soybeans start to be double-cropped after wheat. Soybean acreage expands as farmers find soybeans as an alternative to other cash crops. Soybeans lend themselves easily to no-till planting, especially for beginners.

1969

■ OSU researchers Glover Triplett and David Van Doren find mulch-covered no-till soils reduce surface evaporation, maintain soil moisture and create a favorable environment for root development.

1970

■ No-till plots begin at the Univ. of Kentucky's Spindletop Research Farm in Lexington. The plots remain as only one of a few sites worldwide that have been continuously no-tilled for 50-plus years.

■ Stauffer Chemical sells glyphosate (first patented in 1961 as a descaling and metal chelating agent) to Monsanto, who had discovered its weed-killing properties. "A colossal management blunder by Stauffer," recalls Guy Swanson.

1972

■ Frank Lessiter edits and produces the first edition of *No-Till Farmer* (*NTF*) while at Reiman Publications.

■ Planting of U.S. no-till crops is estimated at 3.3 million acres, according to the first survey of its kind published by *NTF*.

1973

■ Kentucky no-till pioneers Harry Young Jr. and S.H. Phillips are honored at the first national no-till conference held in Hawaii. The pair are the first recipients of *NTF's* Repurposed Plowshare Awards that will recognize 25 outstanding farmers, educators and pioneers from 1973-1981.

■ OSU researcher Glover Triplett suggests a classification system for tillage after recognizing differences in crop response to no-till on different soils.

■ *NTF's* Frank Lessiter testifies before the U.S. House Agriculture Committee on the importance of no-till to agriculture.

■ *NTF* publishes *No-Tillage Farming*, a 224-page book by Shirley Phillips and Harry Young. Considered a milestone in no-tillage literature worldwide, the book is translated into Portuguese.

1993

Purchased first CNC machine tools and plasma table for farm shop to produce spike bevel wheel.

First spiked closing wheel used on planters.

Worked with No-Till Innovator Eugene Keeton (who stopped by with duct tape and steel cables) in developing his seed firmer. We taped the cables to seed tubes and ran the first seed firmer.

1995

First floating row cleaner (C125) produced; tested our prototype of parallel link row cleaner. *Farm Journal* reports a 12-bu. increase using floating vs. rigid pin or screw-adjust.

Started manufacturing the Kinze floating cleaner at the farm, allowing us to keep the same crew year around and providing much-needed revenue during off season.

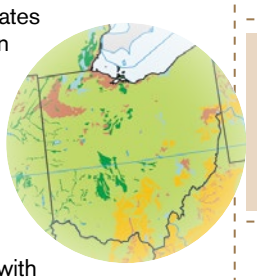
1974

■ Ben Overstreet no-tills his way to a yield of 204 bu. per acre to win the 1973 Georgia corn-growing contest.

■ John Deere introduces the MaxEmerge plateless planter with finger-pickup seed metering, Tru-Vee openers and angled closing wheels.

■ 5.4 million acres of no-till crops are planted in the U.S.

■ A study indicates over 10.5 million acres of Ohio land is suitable for no-till corn production.



■ Farmers and researchers evaluate a new John Deere rig with power-driven circular blades as a possible no-till corn or soybean planter.

■ Monsanto's Roundup herbicide (glyphosate) is made available, dramatically improving no-till's ability to combat weeds. Attendees of *NTF's* Hawaii farm tour get first view of corn plots controlled by the herbicide.

■ Washington's Mort and Guy Swanson build a 29,000-pound no-till drill known as "Old Yeller." A patent would be filed in 1975. Later, the Swansons team up with Mike Johnson and Pete Thomason to build the Comfort King, the first successful no-till drill for the deep Palouse soils of Idaho and Washington.

1975

■ 3rd annual *NTF* tillage survey shows an 18% increase in no-till acres.

■ USDA estimates 95% of U.S. farmland will include reduced tillage by 2010.

■ Introduction of Basagran herbicide (BASF) expands no-till soybean potential.

■ Ohio no-tiller David Brandt imports a Moore seeder from Ireland, the first known no-till drill in the U.S.

1976

■ EPA approves Roundup for use in no-till and conventional-tillage systems.

■ Roy Applequist starts Great Plains Mfg. The company's first product, a 30-foot folding grain drill, receives its first field test under dryland Kansas conditions.

■ Melroe's no-till drill features a triple-disc system that makes direct seeding possible.

1977

■ No-till U.S. wheat production jumps to 614,255 acres, compared to 222,833 acres in 1973.

■ The Soil and Water Resources Conservation Act of 1977 directs USDA to formulate periodic departmental plans for conservation.

1978

■ John Deere introduces its first commercially successful no-till planter, the 7000 series.

Photo Credit: From the collection of The Henry Ford

1979

■ *NTF* publishes an 8-year tillage comparison showing no-till acres increased from 3.3 million acres in 1972 to 7.1 million acres in 1978.

■ Raven's sprayer controller developments bring precision to costly pesticide application.

1980

■ U.S. no-till acres are estimated at 16 million.

■ IH unveils the Early Riser 800 series planter. Key among the no-till features are the staggered double disk openers to more easily cut through residue, the equalizing gauge wheels to reduce row-unit bounce, and reduced inner diameter (RID) gauge wheels to prevent side-wall compaction and more easily close the seed trench. The unit is marketed as an as-is planter that can be used for minimum- or no-till, without requiring special attachments like fluted coulters.

■ Monosem introduces vacuum planters, a new method to accurately place seed at higher, more uniform plant populations.

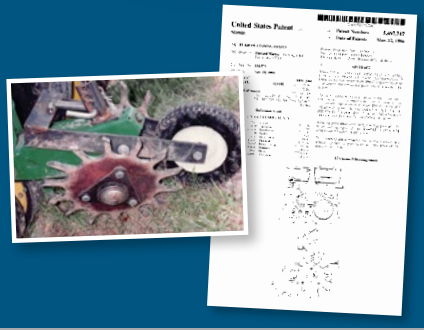
■ Sales of North American farm equipment fall 50% from 1979 because of the economic downturn.

1980-85

■ Many selective and non-selective herbicides compatible with no-till are produced.

1996

Patent issued on 2-stage closing system with spike wheels and rear rubber finishing wheel.



1999

Built new 24,000-sq.-ft. facility with help from Kentucky economic development office.

2001

Doubled plant size (48,000 sq. ft.) with 1,500-sq.-ft. office with help from Kentucky economic development office.

2005

Released compact 1360 floating row cleaner, allowing the use of no-till coulters on planters where it was not possible previously due to length.

1981

■ South American no-till acres reach the same level in 3 years that it takes the U.S. 30 years to reach.

■ Frank and Pam Lessiter acquire *NTF* and launch a new publishing company in their name.

■ The first Milan (Tenn.) No-Till Field Day at the Univ. of Tennessee AgResearch and Education Center attracts 500 farmers. Attendance will soon top 10,000 as farmers from all over the world converge on West Tennessee to learn about no-till.

1982

■ For the first time, U.S. farmers use reduced-tillage practices on more than 100 million acres of land, compared to only 29.6 million acres in 1972.

1983

■ Kinze Mfg. introduces its "push type" planter row unit. No-tillers quickly take to its Interplant systems, which provides an alternative to grain drills and allows the planting of both corn and soybeans at different row widths with one unit.

1984

■ U.K.'s adoption of no-till use increases to 605,000 acres, making it second only to the U.S. in no-till acres.

1985

■ The 1985 U.S. Farm Bill includes a conservation title for the first time. Subsidies for soil conservation motivate farmers to try no-till, and adoption explodes across the plains.

■ Burndown herbicide options experience market expansion.

■ Conservation tillage is the method of choice for a vast majority of grain farmers.

1986

■ 20 years of research shows well-drained soils are the key to producing competitive no-till yields.

■ No-till acres increase 6.9% over 1985 totals, while minimum-tillage acres drop by 1.4%.

■ USDA ag engineers in Temple, Texas, find using no-till in high-clay soils is both possible and profitable.

■ Howard Martin of Elkton, Ky., files a patent for the first ground-driven row cleaner. His invention pushes residue aside so soils dry and warm faster for improved stands – and more planting days for no-tillers.

1987

■ *NTF's* "Tillage Practices Survey" shows 2.1 million acres are farmed with ridge-till in 1987 – a 4.2% nationwide increase over the previous year. Ridge-till is basically no-till planted on a ridge formed the previous year with 1-2 cultivations.

1988

■ John Deere's release of the 750 no-till drill helps producers switch to no-till and boosts soybean adoption. The innovation is said to have done more for no-till than any other no-till equipment development in history, and confirms that John Deere accepts that no-till is here to stay.

"Erosion-Wary Farmers are Spurring the Traditional Plow" headlines a 1982 New York Times article. "I tell farmers they can save soil, toil and oil," says Richard Foell of Chevron's Ortho Agricultural Chemical Div. "We're looking for a 15-25% annual growth rate in no-till acreage. It has an excellent hold in the Northeast, is growing fastest in the Southeast, and Ohio, Indiana, Illinois and Michigan are coming along. But in the farm belt west of there, I continue to argue that farmers are scraping, ripping, tearing and raping the bosom of Mother Earth."

1989

■ *NTF's* 18th Annual "Tillage Practices Survey" shows 17,694 acres of no-tilled cotton.

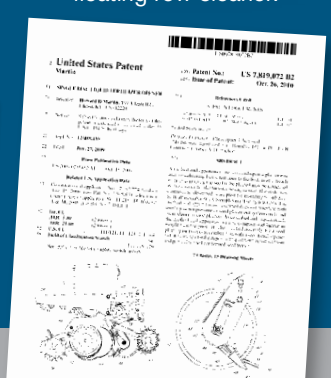
■ 1.9 million acres of no-till, double-cropped soybeans are planted – up from 1.8 million acres in 1988.

2006

Martin's Floating Row Cleaner receives "Reader's Choice" recognition from *No-Till Farmer* subscribers for best planter attachment, and it's also named No-Till's Overall Best Product in the inaugural program. Martin would receive 8 total awards in the 11-year program.

2008

Patented the unit-mounted fertilizer opener, combined with floating row cleaner.



2015

Started working on parallel link super compact row cleaner (ACCR) with integrated air cylinder. Released ACCR floating parallel link row cleaner (patent pending 2017).

2016

Started development of wireless bidirectional air control system (Smart Clean).

Released first 2 x 2 x 2 fertilizer opener (DUAL UMO), placing nutrients at seed depth.

1990

■ Better and less expensive herbicides begin to hit the market, and no-till equipment continues to improve. By the end of the decade, no-till grows from 6% of U.S. farmland to nearly 20%.

■ UK-based Shelbourne-Reynolds sells its first stripper header in Kentucky, a significant development for farmers valuing standing residue. Within 5 years, adoption surges as Western wheat belt growers see the benefits of stripped straw in their no-till systems.

1991

■ No-till acreage grows 24% to 17.6 million acres over 2 years.

■ CrustBuster's 3800 no-till drill lets farmers control seed depth independently of rig's coulters.

■ USDA concerns about residue lead to discussion of possible erosion laws and regulations.

1992

■ No-till reaches 22.5 million acres.

■ 2,4-D is approved for no-till soybeans after a 30-year wait.

■ Trimble introduces real-time kinematic (RTK) technology in 1992, advancing prospects of precision ag.

1993

■ *NTF* hosts its first-ever National No-Tillage Conference in Indianapolis with 814 attendees and 45 speakers slated over 3 days.

■ Illinois farmer Roger Denhart announces plans to no-till 50,000 acres of soybeans near Odessa in southern Ukraine. Farm managers nixed the idea, however, because no-till would've put too many residents on these collective farms out of work.

■ 32 million acres of no-till cropland is reported, a 60% increase from 1991.

1994

■ Russia reports success in using no-till to bring back 11 million acres of farmland destroyed by Chernobyl nuclear power-plant explosion.

■ Eugene Keeton files a patent for his Seed Firmer, a product that was instrumental in helping no-tillers maintain seed-to-soil contact.

■ Precision ag era begins as farmers start using Global Positioning System receivers to determine which areas need specific quantities of water, fertilizer and pesticides. Farmers synthesize this data with yield information, weather forecasts and soil analysis in spreadsheets.

1995

■ Purdue Univ. researchers say adoption of precision technology is the next big step toward efficient no-till farming.

■ Pennsylvania no-tiller Steve Groff is the first N.A. farmer to build a cover crop roller, emulating techniques he learned from Brazilian no-tillers.

1996

■ U.S. no-till acres reach 42.5 million.

■ Monsanto introduces Roundup Ready soybeans, spurring greater interest in reduced tillage.

■ Monosem introduces twin-row planters, another development toward narrower rows.

1997

■ Monsanto introduces biotech corn, cotton and canola.

■ Studies dealing with the impact of row spacing on cereals and pulse crops over 30 years demonstrate benefits for no-till in western Canada.

■ USDA reports that soil erosion on U.S. cropland has fallen by 40% since 1982.

1998

■ Southern Illinois Univ. agronomist George Kapusta says Roundup Ready is the "new kid on the block" for no-till soybeans.

■ Research indicates ammonium sulfate can be an effective source of nitrogen, particularly with no-till corn.

1999

■ No-tillers gear up to sell carbon credits after studies show tillage releases up to 8,000 pounds of CO_2 per acre into the atmosphere each year.

2000

■ U.S. no-till acres are estimated at 50 million.

■ Four Washington no-tillers form an LLC to share a no-till single drill and alleviate the financial burden of each buying bigger equipment.

■ The U.S. EPA places new restrictions on raising *Bt* corn, requiring a 20% refuge area with non-*Bt* hybrids.

2017

NO-TILL Legend

Howard Martin was named a No-Till Farmer Living Legend in 2017. Howard Martin started no-tilling to earn a decent living from poor-quality land and developed specialized no-till equipment, such as planter row cleaners, in his farm shop. Martin's success led to the formation of Martin Industries, among today's leaders in producing no-till planter and drill accessories.

2018

ISO 9001:2015 certification in design and manufacturing; started working with OEMs in new product development.

Developed adjustable angle V-style closing update for Case IH 2000 series; developed cupped Razor closing disc for cover crops.

PRI Performance Review Institute Registrar
Achieving Excellence Together
ISO 9001:2015
Certified Company

2002

■ Jeff Moyer of the Rodale Institute builds first cover crop roller-crimper (later patented) in the U.S. with the help of SARE.

2005

■ The 13th National No-Tillage Conference showcases interest in annual ryegrass as a no-till cover crop.

■ Environmental and consumer groups question safety of Roundup Ready crops, saying they create "super weeds," among other problems.

■ USDA reports that farmers who move from conventional- to no-tillage will save 3.5 gallons of diesel fuel per acre. At 2005 diesel prices, a 1,000-acre farm saves $7,700 in fuel alone.

2006

■ Research results from the U.S. Dept. of Energy's Oak Ridge National Laboratory describe the great potential for biomass – specifically gathered from no-till farms – to fuel cars and trucks in the U.S.

■ OSU soil scientist Warren Dick says gypsum applications on no-till fields can decrease surface crusting and improve aeration and water infiltration, aiding crop emergence.

■ David Trevilyan of Australia speaks at the National No-Tillage Conference about his 120-foot Multiplanter no-till seeder that earned him a world record of seeding 2,337 acres in 24 hours. Four years later, his company built a 212-foot frame for another grower.

2007

■ Glyphosate-resistant horseweed, or marestail, is found in 16 states.

■ 3.6 million acres of corn is strip-tilled, or 19% of no-till corn acres. It's basically no-till on 6-8-inch-tall berms built the previous fall or in the spring.

2008

■ Acres containing either Roundup Ready or LibertyLink corn grow from 30% in 2005 to 60% in 2007.

■ Oilseed radishes hold great promise as a cover crop.

2009

■ Rolf Derpsch, a no-till expert from Paraguay, determines that there are 232.8 million acres of no-till worldwide, including 88.2 million acres in North America.

2010

■ USDA says 35% of U.S. cropland (88 million acres) was no-tilled in 2009. This includes barley, corn, cotton, oats, rice, sorghum, soybeans and wheat acres.

■ USDA says no-till could play a role in U.S. efforts to reduce and control greenhouse gas emissions.

■ The President's Cancer Panel expresses concern over use of atrazine, nitrogen and phosphate due to possible health impacts.

■ David Hula, Charles City, Va., wins National Corn Growers Assn.'s national yield contest at 368.4 bushels per acre in the no-till irrigated category.

2011

■ The Chicago Climate Exchange, which ran the only national carbon-trading market in the U.S., scales back its operations.

■ No-tillers find that planting winter wheat with oilseed radishes boosts no-till wheat yields by as much as 18 bushels per acre.

2012

■ 96 million acres no-tilled – 35% of U.S. total crop acres.

■ *NTF* publishes an in-depth story on using drones for variety of farming tasks to improve the efficiency and effectiveness of scouting programs.

2013

■ No-tillage and cover crops receive major play in U.S. newspapers and magazines. Headlines like "No-till farming is on the rise. That's actually a big deal," appear in the Washington Post.

2014

■ *NTF* launches *Dryland No-Tiller* e-newsletter specifically for Great Plains, Pacific Northwest and Western Canada no-tillers.

■ The Buffett Foundation and USDA hold a national cover crops workshop. Major influencers discuss how to push the acreage seeded to cover crops to 20 million acres by 2020.

2019

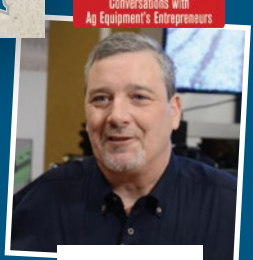
Released planter-frame weight distribution system.

Started testing crusher style closing wheel. (released Fall 2021)

Martin-Till

FARM EQUIPMENT PODCAST
How We Did It: Conversations with Ag Equipment's Entrepreneurs

Steve Martin podcast
Use the QR code at right to listen to this Ag Entrepreneurs podcast where Steve Martin explains the origins of the company.
Farm-Equipment.com/Steve-Martin



Howard Martin Videos
Use the QR code at left to watch this series of quick-hit videos, including an on-location video in Howard's farm shop.
No-TillFarmer.com/Howard-Martin

2015

■ 73% of no-tillers seed cover crops.

■ The National No-Tillage Conference in Indianapolis draws a still-standing record of 1,171 attendees.

■ The Samuel Roberts Noble Foundation and Farm Foundation launch the Soil Health Institute.

2016

■ 9% of total U.S. crop acres seeded to cover crops, up from 4% in 2005 and 1% in 2006.

■ Growers surveyed for 8th annual *NTF* Benchmark Study average 1,146 acres.

2017

■ The 25th Annual National No-Tillage Conference is held in Indianapolis.

■ Illegal off-label use of dicamba herbicide damages 3.6 million acres of soybeans.

■ David Hula of Charles City, Va., achieves a record 542 bushels/acre in irrigated no-till corn in the annual National Corn Growers Assn. competition.

■ USDA reports that cover crop acres increase 50% from 2012-2017.

2018

■ No-tillers Dave Brandt and Gabe Brown, soil health expert Ray Archuleta and grazing consultant Allen Williams form Soil Health Academy and Understanding Ag.

■ Germany's Bayer closes on its $63 billion acquisition of Monsanto.

■ The 2018 U.S. Farm Bill authorizes the production of hemp.

2019

■ Packaged food giant General Mills states it will apply regenerative agriculture to 1 million acres by 2030, an amount equal to 25% of the land from which it sources ingredients in North America. Danone, Kellogg, Nestlé and Land O' Lakes are among others taking similar positions.

■ Lessiter Media's Ag Div. launches *Cover Crop Strategies* website, e-newsletter and virtual events. Its first-ever National Cover Crop Summit draws 3,000-plus attendees.

■ No-tilled acres in the U.S. top 104 million acres in 2017, up 8% over the 2012 figure. The number of farms reporting no-till was flat at just +0.4% in 5 years.

■ Acres seeded in cover crops in the U.S. reach 15.3 million acres in 2017; an increase of 49% over the 2012. Average on-farm cover crop acres increased 30% from 77 acres in 2012 to 100 acres in 2017.

■ Germany announces it will begin phasing out the use of glyphosate in 2020 and completely ban it by 2023 as part of measures rolled out by the country's environment ministry to protect insects.

2020

■ Planting corn in wider 60-inch rows opens room for grazing livestock with cover crops.

■ Indigo Ag and Nori become two of the leading carbon market programs for farmers. Bayer also launches its Carbon Initiative, the latest in a string of recent environmentally focused initiatives by agriculture companies.

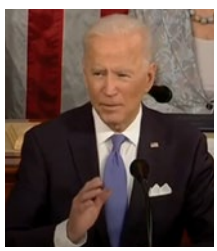
■ The EPA proposes new measures to reduce risks associated with paraquat and better protect human health and the environment.

■ Food company Kellogg commits to phase out the use of glyphosate as a pre-harvest drying agent in its wheat and oat supply chains by 2025.

■ OSU soil scientist Rattan Lal is announced as the 2020 World Food Prize Laureate for his soil-centric approach to increasing food production that conserves natural resources and mitigates climate change.

■ The Assn. of American Pesticide Control Officials (AAPCO) asks the EPA to ban the post-emergent use of four dicamba herbicides – XtendiMax, Engenia, FeXapan and Tavium – by the end of 2020.

2021



■ "When I think about climate change, I think jobs … Farmers planting cover crops so they can reduce carbon dioxide in the air and get paid for doing it."

– President Biden in his April 28, 2021, address to a Joint Session of Congress.

■ Soil Health Academy poll of graduates reveals the majority are experiencing improvements in their operations' resources and net per-acre profits within 2 years or less.

■ After 5 years, the National Corn Growers Assn. shuts down the Soil Health Partnership (SHP) due to lack of funding. SHP had teamed with farmers to collect data on soil conservation practices such as cover crops and reduced tillage.

■ Herbicide requirements continue to fall. While 10 pounds of herbicide were needed per acre in the early 1960s to make no-till work, farmers are using only ounces per acre today.

■ *NTF* starts its 50th year in November 2021.

NO-TILL FARMER 50 YEARS — The No-Till Authority Since 1972