

Corn Sustainability Assurance Protocol

February 13, 2023

Version 1.0



U.S. Grains Council
www.grains.org

INTRODUCTION AND OVERVIEW

The Corn Sustainability Assurance Protocol is a farmer-led initiative developed by the U.S. Grains Council (USGC), an organization that develops export markets for U.S. barley, corn, sorghum and related products including distiller's dried grains with solubles (DDGS) and ethanol. This member-driven organization supports free and fair trade worldwide through programs in more than 50 countries and the European Union.

The Council believes exports are vital to global economic development and to U.S. agriculture's profitability.¹ As the export market developer for U.S. corn producers, the USGC works very closely with the National Corn Growers Association (NCGA), representing the interests of the more than 300,000 corn producers across the U.S.²



U.S. corn production is based on a national system of sustainability and conservation laws and regulations, combined with careful implementation of best production practices by the nation's corn farms. In addition, most U.S. corn producers participate in USDA programs wherein eligibility hinges on following its Conservation Compliance provisions.

USGC and NCGA are both actively engaged in creating a continuous improvement process for all U.S. agriculture within the framework of Field to Market: The Alliance for Sustainable Agriculture™.³ Organized in 2006, Field to Market is the world's largest multi-stakeholder alliance for row crop agriculture sustainability, with more than 165 members representing grower organizations, agribusinesses, university and public sector partners, brands and retailers, and civil society organizations.

Within Field to Market, a set of sustainability indicators for agriculture focused on environmental outcomes were developed in 2009, and later complemented by process-based standards that define goal setting, benchmark development, and other steps for U.S. agriculture to meet those goals.⁴ The principles of continuous improvement in corn production are reflected in this work and were adopted as a framework, in alignment with Field to Market's programs and approach.

INSIGHTS INTO U.S. CORN SUSTAINABILITY TRENDS



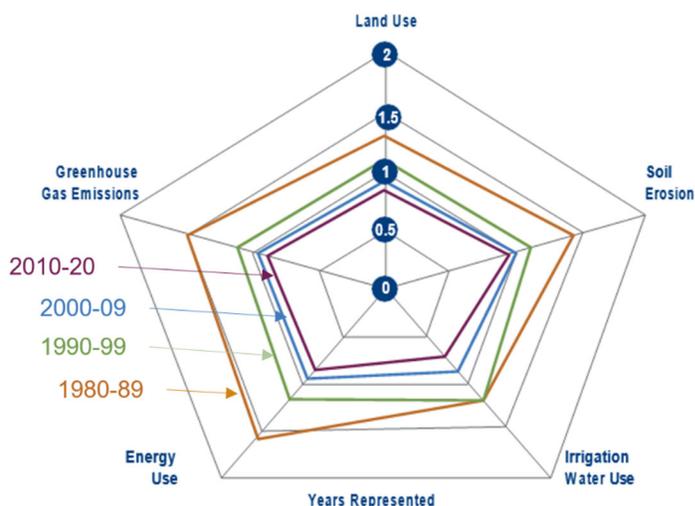
Corn producers are among farmers who most readily adopt new technologies, and the language in the CSAP reflects their willingness to embrace new production practices. Many U.S. corn producers are already engaged in continuous improvement through participation in: Natural Resource Conservation Service's (NRCS) programs, regional projects to address local concerns through Soil and Water Conservation

Districts, initiatives by state-level grower associations, Field to Market Continuous Improvement Accelerator projects, and other programs to advance knowledge and adoption of sustainability practices.

Field to Market’s most recent National Indicator Report (2021) provides a retrospective analysis of the improvements of corn producers across five Key Performance Indicators (KPIs) over a span of four decades. Results for each KPI are indexed to performance for the years 1998-2002 and reported as ten-year averages, which provide trends and important evidence of continuous improvement.⁵ More detailed information about performance across various impact categories can be found through Life Cycle Assessments (LCA), Conservation Compliance assessment inspections and other relevant industry sources.

- 1) reduced greenhouse gas (GHG) emissions
Indicator: pounds CO2 per bushel.....**-48%**
NCGA 2030 Goal: Reduce GHG Emissions by 13%
- 2) improved energy use efficiency
Indicator: BTU per bushel.....**-55%**
NCGA 2030 Goal: Increase energy use efficiency by 13%
- 3) improved irrigation efficiencies, leading to per bushel declines in irrigation water use
Indicator: acre inches per bushel.....**-56%**
NCGA 2030 Goal: increase irrigation water use efficiency by 15%
- 4) reduced soil loss per acre
Indicator: tons of soil loss per acre.....**-40%**
NCGA 2030 Goal: Reduce soil erosion by 13%
- 5) decreased the amount of land required to produce a bushel of corn
Indicator: planted acres per bushel.....**-44%**
NCGA 2030 Goal: Reduce land use impact by 12%

Source: ‘Field to Market National Indicators Report’, 2021



¹Note: FtM measured reductions are for 1980-2020 period. NCGA’s 2030 reduction goals are set using 2020 baseline.

THE CORN SUSTAINABILITY ASSURANCE PROTOCOL

The U.S. Corn Sustainability Assurance Protocol describes the regulations, processes and management practices that ensure sustainable corn production. This Sustainability Protocol is one part of the overall U.S. corn producer sustainability program, which is tracked by a national measurement system of environmental outcomes by producers through the National Indicators Report written by Field to Market: The Alliance for Sustainable Agriculture™.⁶

The U.S. Corn Sustainability Assurance Protocol (CSAP) offers international corn buyers and export markets insights into U.S. corn production sustainability practices and outlines U.S. state and federal laws that provide assurances that these practices are being implemented, where required, throughout the country.

The CSAP is organized into eleven impact categories that benchmark the sustainability standards used for other crops. These categories align with the eight critical environmental outcomes that Field to Market calculates as indicators of sustainable agriculture in the 2021 National Indicators Report: biodiversity, energy use, greenhouse gas emissions, irrigation water use, land use, soil carbon, soil conservation and water quality.⁷

The CSAP Impact categories are:

Table 1: Impact Categories for U.S. Corn Sustainability Assurance Protocol (CSAP)	
Greenhouse Gas Emissions & Air Quality	Agrochemical & Nutrient Management
Water Quality & Quantity	Waste & Pollution
Soil Health & Productivity	Working Conditions & Labor Relations
Land Use, Sensitive Habitats and Biodiversity	Worker & Public Safety
Crop Health & Agricultural Best Management Practices	Community Relations
Continuous Improvement	

CSAP: COMPLIANCE FRAMEWORK

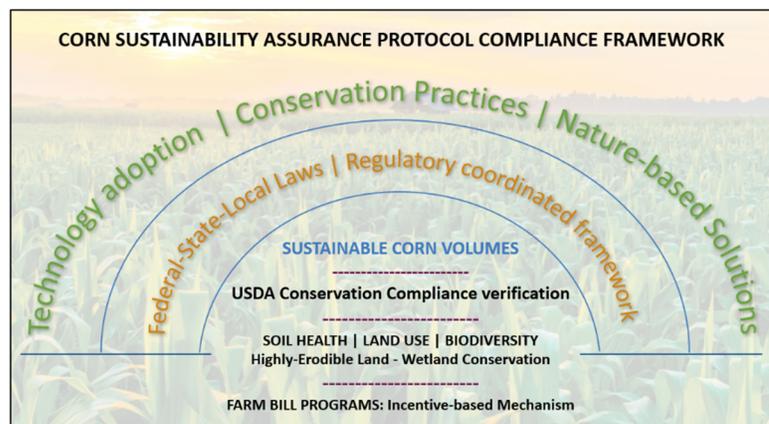
The U.S. Corn Sustainability Assurance Protocol (CSAP) has been developed to provide insights to consumers of U.S. corn and corn products of the commitment of growers to continue to adopt strategies and technologies to improve the sustainability of agriculture. The CSAP outlines the prevailing and recommended practices for U.S. corn production, as well as the laws and regulations that govern the various impact categories described.

Operationally, under the CSAP the conservation compliance requirements set by USDA Farm Service Agency programs serve to define the CSAP’s minimum verification threshold. This requires producers to submit an annual internal audit of compliance with the Highly Erodible Land Conservation and Wetland Conservation provisions (Form AD1026) and makes them subject to on-farm verification/review. Under this framework, each marketing year a total allocation of U.S. sustainable corn volume is established to be used under a mass-balance sourcing approachⁱ, which is determined by using 1) the number of qualified corn acres participating in U.S. Farm Service Agency programs in a given marketing year, and 2) the average yield per acre recorded for these acres in that period.

The mass-balance sourcing approach used under CSAP means that only the aggregate mass of corn and corn products meeting the minimum verification threshold will be eligible for sustainability allocation under the CSAP program. This process creates a motivation to increase the number of acres eligible for sustainability allocation of U.S. corn and corn products.

Verification of the internal audits submitted by producers is conducted by the USDA-Natural Resource Conservation Service (NRCS), which each year selects at random a group of producers with highly erodible land or wetlands for review, that can range from 1% to 5% of producers participating in its programs. Additionally, U.S. corn producers can adopt complimentary sustainability disclosure tools such as Field to Market’s Fieldprint Calculator⁸.

Please see the ‘Corn Sustainability Verification’ section on page 21, for more details.



ⁱ “Mass balance is a sourcing method that allows for certified and non-certified ingredients to become mixed during the shipping and manufacturing processes”; Rainforest Alliance, ‘What is Mass Balance Sourcing’, <https://bit.ly/3AW2uH5>

IMPACT CATEGORIES & CONTINUOUS IMPROVEMENT GOALS

Although centered in the Midwest and Upper Midwestern States, corn can be grown in nearly every state and each year around 90 million acres (36 million hectares) of corn are planted in the U.S. Across this vast expanse, several factors come into play regarding how corn is grown, including types of soil, climate conditions, rainfall, topography, geology and even the type of equipment used for farming.

All these factors play into the day-to-day decisions that farmers make on their operations, which are different for each corn farm, and have different sustainability-related impacts. CSAP impact categories acknowledge this complexity and define general continuous improvement goals for corn producers to pursue.

The CSAP identifies key impact categories and develops continuous improvement goals that align with NCGA's sustainability commitments and Field to Market's measurement framework, where applicable, with the recognition that sustainable agricultural production is not the sole responsibility of the producer, but rather that corn producers are part of a system, and that they participate in multiple supply chains that reach end-consumers.

Furthermore, the CSAP acknowledges the global impact of agricultural production and the importance of common frameworks for understanding and discussing sustainability. The CSAP identifies the potential to link voluntary sustainability standards like the United Nations 17 Sustainability Development Goals (SDGs)⁹, which represent "a blueprint to achieve a better and more sustainable future for all by 2030".

The SDGs were developed as a call to action for all countries of the world to develop strategies to "improve health and education, reduce inequality, and spur economic growth" while addressing climate change and preserving oceans and forests. Appendix 1 shows that many of the CSAP Impact Categories and Compliance Criteria can be linked to key targets in the SDGs.

Corn Sustainability Assurance Protocol Impact Categories



I. Greenhouse Gas Emissions, Fossil Fuel Use & Air Quality

Continuous Improvement Goals

- ✓ Continued improvement in energy use efficiency
- ✓ Reduced emissions from U.S cropland per unit of output
- ✓ Sustained contribution to reducing the overall greenhouse gas emissions from the agricultural landscape

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers strive to adopt best management practices to reduce GHG Emissions by:**
 - a. Reducing energy usage through conservation tillage methods as appropriate.
 - b. Optimizing nitrogen (N) and phosphorus (P) fertilizer use and application.
 - c. Monitoring and reducing fossil fuel use for management records and to increase enterprise viability.
 - i. The NRCS maintains four energy tools to increase awareness and help farmers identify energy reduction potential in their operations. The estimators can be used to estimate potential energy savings for irrigation, nitrogen fertilizer use, grain drying and tillage systems.¹⁰ The NRCS also maintains energy conservation tools to help farmers estimate current energy usage and calculate energy and cost savings that could be achieved through the use of high efficiency equipment and energy conserving practices, and renewable energy tools to help farmers estimate energy production potential from solar panels, wind turbines and biogas.¹¹
 - d. Utilizing renewable energy resources, when possible, to reduce fossil fuel use.
 - e. Prioritizing transportation methods such as barge and rail, when possible, to reduce GHG emissions and fossil fuel use.
- 2. Producers are required to comply with the Clean Air Act and its amendments to protect and enhance air resources to promote public health and welfare.¹²**
- 3. Producers adopt Precision Farming Techniques as appropriate utilizing Global Positioning System (GPS) and other advanced technologies to optimize fossil fuel use and fertilizer application.**
- 4. Producers support the development of non-fossil fuel ethanol. Each year, roughly 30 percent of U.S. field corn goes into fuel ethanol.**
- 5. Producers support ethanol production, job creation and economic vitality across the U.S. In 2019, the U.S. ethanol industry helped support nearly 349,000 direct and indirect jobs.**



II. Water Quality & Quantity

Continuous Improvement Goals

- ✓ Continued improvement in irrigation water use efficiency and conservation on U.S. cropland
- ✓ Improved regional water quality through reduction in sediment, nutrient and pesticide loss from U.S. cropland

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are expected to protect the quality and supply of surface and ground water by utilizing best management practices, including development of nutrient management plans, and following local, state, and federal regulation to:**
 - a. Optimize irrigation and comply with all applicable water conservation efforts in their irrigation districts to ensure effective and equitable allocation of water resources.
 - b. Adopt appropriate conservation tillage methods to reduce water runoff and increase infiltration.
 - c. Implement best management practices to reduce phosphorus (P) and nitrogen (N) loss and transport.
 - i. Balance P and N inputs with outputs.
 - ii. Use proper application rates, methods and timing for P and N application, in line with the 4R Principles of nutrient management or other nutrient management methodologies.
 - iii. Use cover crops, terracing, strip cropping, contour farming, filter strips, conservation buffers and other management and structural conservation practices suited to the farm to minimize erosion runoff and P and N transport.
- 2. Producers are required to comply with Clean Water Act Law 40 parts 116–117 which regulate discharges of designated hazardous substances. Facilities must immediately notify the National Response Center and state agencies of any unauthorized discharge of reportable quantity of designated hazardous substance into navigable waters, the shorelines of navigable waters and contiguous zones. Discharge of harmful quantities of oil must also be reported immediately.¹³**
 - a. Watersheds with stream reaches with demonstrated water quality concerns are listed by each state government on the US EPA Clean Water Act 303(d) list.
 - b. State governments may require monitoring under Clean Water Act section 319 to ensure the implementation of best management practices and to determine how conservation measures affect water quality.
 - c. Producers comply with National Pollutant Discharge Elimination System (NPDES) requirements on discharges of biological pesticides, and chemical pesticides that leave a residue, into waters of the U.S.¹⁴
- 3. Producers are required to comply with Section 404 of the Clean Water Act regarding agricultural impacts on wetlands.¹⁵**
- 4. Producers are required to comply with Safe Drinking Water Act to protect public health by preventing contamination of surface and ground sources of drinking water.¹⁶**

III. Soil Health & Productivity

Continuous Improvement Goal

- ✓ Continued reduction in soil erosion on all U.S. croplands

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are expected to utilize best management practices appropriate to their soils, topography and climate conditions to maintain or improve soil quality and soil carbon and to avoid erosion.**
 - Producers should adopt conservation practices like crop rotation, cover crops and nutrient management to improve soil health.
 - Producers should adopt conservation and no till methods suited for their land in order to increase soil health and organic matter, increase infiltration and moisture retention and reduce soil compaction and soil erosion.
 - Producers should implement a wide variety of conservation practices such as terraces, riparian buffers, strip cropping, contour farming, filter strips, waterways and other strategies to minimize soil erosion.
- 2. Producers shall monitor and maintain or improve soil health.**
 - The NRCS recommends soil testing every 3-5 years and more frequently if manure is applied or if attempting to make large nutrient or pH changes in the soil. Soil sampling is provided by most county extension offices and state university cooperative extension services as a free or low-cost service. Soil sampling data is generally maintained by the producer.
 - Precision Farming techniques utilizing Global Positioning System (GPS) help producers implement grid soil sampling.
- 3. Producers are required to comply with the Highly Erodible Land Conservation and Wetland Conservation Provision.¹⁷**
 - Highly erodible land is defined as soils that have an erodibility index of eight or more. The USDA will keep record of highly erodible land. Producers may obtain aerial imagery of their farms and a printout of their farm and tract records from the local USDA office administering their farm.
 - Producers will maintain compliance with highly erodible land regulations by creating and implementing a required conservation system plan.
 - Producers file Form AD-1026¹⁸ with USDA Farm Service Agency certifying adherence to Highly Erodible Lands Conservation provisions.
 - Producers planning to make changes which could impact highly erodible land must notify USDA for appropriate technical determination.
- 4. Producers are required to comply with the USDA Sodsaver provisions¹⁹ which helps protect native sod in Minnesota, Iowa, North Dakota, South Dakota, Montana and Nebraska.**
- 5. Producers are required to follow all local regulations pertaining to burning crop residue and leaving crop residue in place to provide desirable agronomic advantages including water storage and soil fertility.**

IV. Land Use, Sensitive Habitats & Biodiversity

Continuous Improvement Goals

- ✓ Support of diverse species and ecosystems by conserving and enhancing habitats across U.S. agricultural landscapes
- ✓ Improved productivity on U.S. croplands

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are expected to adopt conservation practices such as enhancing pollinator habitats, early successional habitat development, planting cover crops, vegetated buffer strips, ponds and riparian buffers to improve wildlife habitat.**
- 2. Producers should maintain or enhance and protect on-farm biodiversity through the preservation of native vegetation, where possible.**
- 3. Producers are encouraged to participate in conservation programs that provide incentive for the preservation of native vegetation and to adjust management practices to benefit species biodiversity.**
- 4. Producers are required to comply with U.S. Endangered Species Act²⁰ to protect listed animal and plant species from extinction by preserving the ecosystems in which they survive.**
- 5. Producers are required to comply with Federal Migratory Bird Treaty for protection of shared migratory bird resources.**
- 6. Producers are required to comply with U.S. laws that prohibit altering the habitat of endangered or threatened species in such a way that disrupts essential behavioral patterns including but not limited to breeding, feeding and sheltering.**
- 7. Producers develop a Habitat Conservation Plan²¹ if required as part of an application for private entities undertaking projects that might result in the destruction of an endangered or threatened species.**
- 8. U.S. Corn is not produced on highly biodiverse grassland (native grasslands).**
 - a. The USDA Conservation Reserve Program (CRP) Grasslands provides rental payments and cost-share assistance to enrolled producers to maintain and protect grassland, including rangeland and pastureland, with an emphasis on plant and animal biodiversity.
- 9. U.S. Corn is not produced on wetlands or on peatland.**
 - a. Producers are in compliance with U.S. Wetlands Conservation provisions, including the prohibition of production of an agricultural commodity on wetlands or peatland converted after December 23, 1985.²²
 - i. Wetland is defined as an area that: has a predominance of hydric soils; is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of water tolerant vegetation typically adapted for life in saturated soil conditions.
 - ii. USDA NRCS makes and keeps records of wetland determinations, which remain in effect as long as the land is used for agricultural purposes. Producers are provided with copies of this information from the local USDA office.

- iii. Producers planning to make changes which could impact wetlands must notify USDA for a technical determination before proceeding.
 - iv. Producers file Form AD-1026²³ with USDA Farm Service Agency certifying adherence to Highly Erodible Lands Conservation and Wetland Conservation provisions.
- b. Producers are required to maintain compliance with wetland conservation regulations by not draining or converting wetlands.
 - c. Producers are required to follow applicable state laws that prohibit changing peatland without a regulated permit.
 - d. Producers are required to not plant on a converted wetland.
 - e. Producers do not convert a wetland to make possible production of agricultural commodity.
 - f. Producers are required to follow Section 404 of the Clean Water Act regarding agricultural impacts on wetlands.²⁴
 - g. The USDA Farmable Wetlands Program provides rental payments to producers for restoring and establishing plant cover on wetlands and wetland buffer zones that were previously farmed.²⁵
 - h. The NRCS Wetland Reserve Easement Program²⁶ enrolls cropland that was formerly wetlands and restores them to their natural wetland condition in either 30-year or permanent easements. To date, some 1.2 million hectares of cropland have been enrolled in the program and restored to wetlands.²⁷

10. Primary forest or continuously forested land will not be converted to land for future corn production.

- a. Producers are required to follow U.S. laws regarding conversion of primary forests to other uses. Use or occupancy of national forest system land is prohibited without special-use authorization.²⁸
- b. Producers are required to follow U.S. laws prohibiting the use, occupancy or conversion of public lands in National Forests and Grasslands.
- c. The NRCS Healthy Forests Reserve Program provides owners with 10-year restoration agreements and 30-year or permanent easements for conservation actions intended to improve biological diversity, increase carbon sequestration or help threatened or endangered species.²⁹ Forestland that is part of a working farm or ranch can also be protected by permanent easements in the NRCS Agricultural Easement Program.³⁰
- d. For more than 100 years, the amount of forested land in the United States has stayed relatively constant and is currently at 309 million hectares.³¹

11. U.S. Corn is not produced on designated protected areas.

- a. Producers follow U.S. laws that prohibit the production of corn on land under federal protected status, land designated wilderness or research natural areas, protected land in national forests and grasslands, and land in the national landscape conservation system.
- b. Producers follow U.S. laws that prohibit production of corn on land protected by national park service.

V. Crop health & Agricultural Best Management Practices:

Continuous Improvement Goals

- ✓ Continued adoption and access to sustainability-enhancing agricultural practices, technologies, and innovations to increase plant and crop health.
- ✓ Increased implementation of new and existing best agricultural management practices

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are encouraged to use best management practices to protect and improve the quality of plant stocks and crops.**
- 2. USDA's National Seed Storage Laboratory maintains the genetic diversity of crop seed stock important to agricultural production and works to develop and maintain unique germplasm.**
- 3. The Germplasm Enhancement Maize (GEM) program works to increase the genetic diversity and reduce the genetic vulnerability of commercial hybrids.**
- 4. U.S. Corn seed commerce complies with the Federal Seed Act³² regarding fair trade and proper labeling.**
- 5. Producers are required to comply with Plant Protection Act³³ regulations regarding the import of plants and plant products.**
 - Producers support use of naturally occurring processes in developing plant/crop improvements for agricultural purposes within appropriate guidelines (e.g., enhanced ploidy, gene editing, RNA interference [RNAi], biologicals, etc.)
- 6. Producers' crops are grown under the federal government's coordinated framework for regulation of biotechnology, which is a coordinated, risk-based system to ensure that new biotechnology products are safe for the environment and human and animal health.³⁴**
 - The USDA's Animal and Plant Health Inspection Service (APHIS)³⁵ is responsible for protecting agriculture from pests and diseases including regulatory oversight over products of modern biotechnology that could pose such a risk.
 - The Environmental Protection Agency through a registration process regulates the sale, distribution and use of pesticides in order to protect health and the environment, regardless of how the pesticide was made or its mode of action. This includes regulation of those pesticides that are produced by an organism through techniques of modern biotechnology.
 - The Food and Drug Administration is responsible for ensuring the safety and proper labeling of all plant-derived food and feed, including those developed through genetic engineering.



VI. Agrochemical & Nutrient Management

Continuous Improvement Goal

- ✓ Continued reductions in sediment, phosphorus, nitrogen, and pesticide loads from agriculture in U.S. waterways

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are encouraged and incentivized to adopt a wide range of conservation practices such as conservation tillage, crop rotation, cover crops, buffers and nutrient management appropriate for their farms to reduce nutrient and pesticide/herbicide loss and runoff.**
- 2. Producers implement Precision Farming Techniques as appropriate utilizing Global Positioning System (GPS) and other advanced technologies like the following.**
 - a. Variable rate fertilizer and herbicide application
 - b. Field mapping for herbicide, pesticide, and fertilizer application
- 3. Producers are required to follow the U.S. Environmental Protection Agency (EPA) Worker Protection Standard for Agriculture Pesticides³⁶ meeting regulations for: pesticide safety training, notification of pesticide application, use of personal protective equipment, restricted-entry intervals after pesticide application, decontamination supplies and emergency medical assistance.**
- 4. Producers are required to follow Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)³⁷ maintaining compliance with agricultural chemical handling, storage and application regulations.**
 - a. All pesticides are registered with EPA with proper labels and used in accordance with specifications including how and under what conditions chemicals can be applied.
 - b. Certification and training are required for pesticide applicators using restricted use pesticides.
 - c. Producers adhere to EPA regulations concerning rotation of chemical active ingredients.
 - d. Pesticides are classified for general or restricted use. Restricted category pesticides may be used only under the direct supervision of certified applicators, or under such other regulatory restrictions as the EPA administrator may require.
 - e. U.S. regulations provide penalties for violations of FIFRA regulations and violation of these instructions is equivalent to violating the law; consequences can include criminal prosecution, civil remedies for damages and loss of license.
 - f. FIFRA provides states the authority to regulate the sale or use of any federally registered pesticides in that state.
 - g. Producers adhere to all federal regulations and guidelines on farm chemical application, including not applying WHO Class Ia, Ib, and II pesticides within 500 meters of populated areas or water bodies.
- 5. The U.S. is signatory to Rotterdam Convention of the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticide in International Trade enforcing a banned list of chemicals for producer use.**

6. Producers are required to comply with the Toxic Substances Control Act³⁸ to regulate chemicals that pose an unreasonable risk to health or to the environment and to regulate these chemicals' distribution and use.
7. Producers are required to follow the Resource Conservation and Recovery Act which controls hazardous waste, non-hazardous solid waste and underground storage tanks.³⁹
8. Producers are required to follow Safe Drinking Water Act regulations to protect public health by preventing contamination of surface and ground sources of drinking water.⁴⁰

Adequate agrochemical and nutrient management are very important for U.S. Corn producers.

Proper application rates, methods and timing for nutrient and protection products should be in line with the 4R Principles of nutrient management or other nutrient management methodologies.



nutrient stewardship



RIGHT SOURCE

Matches fertilizer type to crop needs.



RIGHT RATE

Matches amount of fertilizer type crop needs.



RIGHT TIME

Makes nutrients available when crops needs them.



RIGHT PLACE

Keep nutrients where crops can use them.

Source: 4R Nutrient Stewardship, <https://nutrientstewardship.org/>

VII. Waste & Pollution

Continuous Improvement Goals

- ✓ Continued efforts to minimize waste throughout the production, processing and consumption process
- ✓ Continued use of agricultural technologies to expand the uses for corn and make the use of corn products even more efficient

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

1. Producers take measures to reduce and recycle waste and meet local regulations as related to waste recycling.
2. Producers are required to follow local regulations pertaining to burning crop residue.
3. Producers are required to comply with Clean Water Act Law 40 parts 116-117 which regulate discharges of designated hazardous substances. Facilities must immediately notify the National Response Center and state agencies of any unauthorized discharge of reportable quantity of designated hazardous substance into navigable waters, the shorelines of navigable waters and contiguous zones.
4. Discharge of harmful quantities of oil must also be reported immediately.⁴¹
 - a. Watersheds with stream reaches with demonstrated water quality concerns are listed by each state government on the U.S. EPA Clean Water Act 303(d) list.
 - b. State governments may require monitoring under Clean Water Act section 319 to ensure the implementation of best management practices and to determine how conservation measures affect water quality.
 - c. Producers comply with National Pollutant Discharge Elimination System (NPDES) requirements on discharges of biological pesticides and chemical pesticides that leave a residue in waters of the U.S.⁴²



Image: Bioreactor used to decrease nitrate-nitrogen being deposited in waterways

VIII. Working Conditions & Labor Relations

Continuous Improvement Goals

- ✓ Improved worker economic and hiring protections, and improved labor productivity
- ✓ Continued compliance with prevailing laws and regulations

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are required to follow the Fair Labor Standards Act⁴³ which prescribes standards for basic minimum wage and prohibits the employment of children under age 16 during school hours and in certain jobs deemed dangerous.**
- 2. Producers are required to comply with the Federal Equal Employment Opportunity Law⁴⁴ which provides the following protections:**
 - a. Prohibits employment discrimination based on race, color, religion, sex or national origin.
 - b. Protects men and women who perform substantially equal work in the same establishment from sex-based wage discrimination.
 - c. Protects individuals who are 40 years of age or older.
 - d. Prohibits employment discrimination against qualified individuals with disabilities.
 - e. Prohibits employment discrimination based on genetic information.
 - f. Prohibits employment discrimination based on sexual orientation and gender expression.
 - g. Provides guidelines on employee selection procedures.
- 3. Producers are required to comply with the Migrant and Seasonal Agricultural Worker Protection Act⁴⁵ which provides safeguards to migrant and seasonal agricultural workers.**
- 4. Producers are required to comply with the Abolition of Forced Labor Act⁴⁶ in that they do not make use of any type of forced or compulsory labor including:**
 - a. As a means of political coercion or education or as a punishment for holding or expressing political view or views opposed to the established political, social or economic system
 - b. As a method of mobilizing and using labor for purposes of economic development
 - c. As a means of labor discipline
 - d. As a punishment for having participated in strikes
 - e. As a means of racial, social, national or religious discrimination
- 5. Producers are required to comply with Victims of Trafficking and Violence Protection Act⁴⁷ providing protection and assistance for victims of trafficking regardless of immigration status.**
- 6. Producers recognize the Right of Association for workers, including the right to unionize or engage in collective bargaining in accordance with applicable federal and state laws.⁴⁸**
- 7. Producers are expected to actively support ongoing efforts to seek, recruit and promote women in leadership positions throughout state and national organizations.**

IX. Worker & Public Safety

Continuous Improvement Goals

- ✓ Improved worker, public safety and well-being
- ✓ Continued compliance with prevailing laws and regulations

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

1. **Producers are required to comply with the U.S. Environmental Protection Agency (EPA) Worker Protection Standard for Agriculture Pesticides⁴⁹ meeting regulations for: pesticide safety training, notification of pesticide application, use of personal protective equipment, restricted-entry intervals after pesticide application, decontamination supplies and emergency medical assistance.**
 - a. An application exclusion zone of 100 feet horizontally from application equipment is required whether the pesticide is applied by air blast application, as a spray or fumigant, mist or fog. Applicators must suspend application if they are aware of any person in the application exclusion zone per regulation in Worker Protection Standard by EPA.
2. **Producers are required to comply with Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)⁵⁰ maintaining compliance with agricultural chemical handling, storage and application regulations.**
3. **Producers are required to comply with Occupational Health and Safety Act (OSHA)⁵¹ to ensure safe and healthful working conditions including workplace violence guidelines. OSHA provides the following protections:**
 - a. Employees may request an OSHA inspection of the workplace.
 - b. Employees may use their rights under law without retaliation and discrimination.
 - c. Employees receive training, in a language they understand, about hazards, methods to prevent harm and the OSHA standards that apply to their workplace.
4. **Employees can be terminated for noncompliance with OSHA safety regulations.**
 - a. Producers are required to follow federal and state regulations prohibiting assault and battery.
 - b. Producers are required to comply with the Clean Air Act and its amendments to protect and enhance air resources to promote public health and welfare.⁵²
 - c. Producers are required to comply with the Resource Conservation and Recovery Act which controls hazardous waste, non-hazardous solid waste and underground storage tanks.⁵³
 - d. Producers are required to comply with the Safe Drinking Water Act to protect public health by preventing contamination of surface and ground sources of drinking water.⁵⁴

X. Community Relations

Continuous Improvement Goal

- ✓ Promoting and maintaining good relationships between corn producers and the communities

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are encouraged to have documentation of land ownership, leases or other legal agreements to utilize land for purpose of corn production.**
 - a. The Federal Land Policy Management Act protects public lands from exploitation without authorization or rental agreement.⁵⁵
 - b. Land use contracts are governed by state statutory and U.S. common law. The U.S. court system is the mechanism for mediating land use disputes.
- 2. Producers have access to information about farmland protection and stewardship through the USDA Natural Resources Conservation Service (NRCS) and American Farmland Trust's Farmland Information Center,⁵⁶ which provides statistics, laws, organization links, literature and technical tools as well as state-specific resources.**
- 3. Additionally, the USDA NRCS provides funds to help purchase development rights to keep productive farmland in agricultural uses through the Agricultural Land Easement Program (ACEP),⁵⁷ and the American Farmland Trust⁵⁸ establishes programs and policy for protecting agricultural land through conservation easement programs, planned growth with agriculture in mind, as well as stewardship and conservation practices.**
 - a. The Emergency Planning and Community Right-to Know Act supports community awareness and response to hazardous substances used in society.⁵⁹
 - b. USDA cooperative extension system office is a nationwide educational network that provides research-based information regarding standard agricultural practices.
 - c. The Environmental Protection Agency Water Data Tool How's My Waterway⁶⁰ provides information about potential watershed contamination.
 - d. Producers support the publishing and maintenance of publicly available information on the regulatory status of products developed with plant breeding innovations by all federal agencies charged with oversight responsibilities.
 - e. Producers support the development of local resource planning groups composed of agricultural landowners and producers, such as Soil and Water Conservation Districts to address local conservation and environmental issues.
 - f. Producers engage with local communities to ensure that communications of concerns, complaints or other grievances between community members and producers are understood and addressed in a collaborative manner.
- 4. Producers support via tax dollars, free public education for all children grades K-12.**
- 5. Producers support agricultural related education programs through the USDA cooperative extension system, a nationwide educational network that provides research-based information regarding agricultural practices.**
- 6. At the local level, producers support the 4-H youth education program⁶¹ whose mission is to give ALL youth equal access to opportunity. 4-H provides young people with community, mentors and learning opportunities to develop the skills they need to create positive change in their lives and communities, including a focus on STEM programs**

(Science, Technology, Engineering and Math), Healthy Living and Civic Engagement. 4-H membership now exceeds 6 million with some 50,000 volunteers.

7. Producers support the Future Farmers of America (FFA).⁶² The FFA is the premier youth organization preparing members for leadership and careers in the science, business and technology of agriculture. Currently, there are 760,000 members in 8,739 local chapters in all 50 states and Puerto Rico.
8. The USDA Foreign Agriculture Service (FAS)⁶³ administers programs that help developing countries advance their agricultural systems and trade capacity. In partnership with the U.S. Agency for International Development, FAS administers U.S. food aid programs and education programs designed to reduce hunger and improve literacy, especially for girls. Programs include the Food for Progress Program, Local and Regional Food Aid Procurement Program, McGovern-Dole Food for Education Program and the Bill Emerson Humanitarian Trust.
9. The USDA Food and Nutrition Service administers federal nutrition assistance programs to reduce hunger in the U.S. by providing food and healthful diet and nutrition education to children and low-income people. Programs include WIC, Supplemental Nutrition Assistance Program, school meals and summer food service.
10. Producers generally support continued U.S. membership in the World Trade Organization (WTO) and support the authority of the WTO to arbitrate trade disputes and implement enforcement actions.



XI. Continuous Improvement

Continuous Improvement Goal

- ✓ Improved sustainability by continuing to adopt current best management practices and by adopting and supporting the development of new methods and technologies

BEST PRACTICES, REGULATIONS AND COMPLIANCE CRITERIA

- 1. Producers are encouraged and incentivized to utilize best management practices as appropriate for their soils, topography, climate and equipment to optimize yield, water use, agrochemical use, soil health and water quality and improve wildlife habitat.**
 - a. NRCS assesses conservation practice outcomes and administers several programs to incentivize improvements in soil erosion, soil health, carbon sequestration, wildlife habitat, wetland restoration, nutrient efficiency, water quality, irrigation efficiency, groundwater protection and reforestation.⁶⁴
- 2. Producers are expected to continue to adopt and support the development of innovations that improve crop production.**
 - a. Genetics and Biotechnology: Advances have allowed producers to reduce tillage, pesticide usage, fuel consumption and GHG emissions per bushel while maintaining or improving yields.
 - b. Equipment: Innovations like improved no-till drills, air seeders and Y Drops for applying fertilizer in-season have improved efficiency by increasing the speed and accuracy of planting and harvesting.
 - c. Technology and Data: Precision agriculture technology, Global Positioning System (GPS), yield monitors and other technological improvements have improved management data and helped producers optimize costs and yields.
 - d. Weather Forecasting: More accurate weather forecasting and improved technology that provides access to forecast data in the field or remotely enables producers to improve decision making, reduce risk and more accurately provide what their crops need.
- 3. Producers are encouraged to continue to adopt and support the development of innovations that improve crop management, such as:**
 - a. The Cloud allows increased data storage, management and remote access to improve crop management decisions.
 - b. Scalable sustainability software allows producers to model and compare different management options for their fields.
 - c. Blockchain technology enables precise tracking of where and how crops were managed.
 - d. Robotics systems can assist with labor management, post-harvest processing, supply chain logistics and equipment operation.
 - e. Satellite imagery allows producers to remotely monitor crops and make management decisions.
 - f. Improvements in Hyperspectral Imaging Spectroscopy (HIS) and the development of a Global Hyperspectral Imaging Spectral- library of Agricultural-Crops (GHISA)⁶⁵ will improve modeling, mapping and monitoring of agricultural crops globally.

- g. Smart drainage systems, infield sensors, subsurface irrigation and on-farm irrigation storage and re-use allow for improved water management and irrigation.
- 4. Producers are expected to continue to adopt and support the development of innovations that improve the sustainable production of corn.**
- a. Clean energy technologies, energy storage, energy efficiency and carbon dioxide capture measures are adopted as possible to reduce energy use and GHG emissions.
- 5. Continuous improvement is supported by a variety of regulated conservation programs and technology transfer systems, including:**
- a. The Conservation Reserve Program to protect the most sensitive areas by providing financial assistance to set aside on a long- term basis for cropland vulnerable to soil erosion or critical to wildlife habitat (8.4 million hectares enrolled as of 2019).⁶⁶
 - b. The Conservation Stewardship Program to reward producers for overall conservation performance across entire operations (18.2 million hectares enrolled as of 2021).⁶⁷
 - c. The Environmental Quality Incentive Program to provide financial and technical assistance to increase environmental quality of farmland still in production (21 million hectares enrolled in 2017, 2018 and 2019).⁶⁸
 - d. The Regional Conservation Partnership Program provides financial and technical assistance for locally identified projects funded by both federal and partnering entities (10 million hectares benefited through 375 local projects with over 3,000 partners at the end of 2019).⁶⁹
 - e. The Conservation Effects Assessment Project quantifies the environmental effects of conservation practices and programs on the environment and develop the science base for managing the agricultural landscape for environmental quality.⁷⁰
 - f. Landscape initiatives are used to accelerate the benefits of voluntary conservation programs, such as cleaner water and air, healthier soil and enhanced wildlife habitat. In 2022, NRCS operated 11 Landscape Initiatives across the U.S. for wildlife, water, ecosystems, pollinators and forestry.⁷¹
 - g. Producers engage in education, technology transfer and practice adoption through numerous informational mechanisms such as interactions with certified crop advisors, tours of discovery farms, university experimental field and research field days, farmer-to-farmer programs, tactical agriculture programs and participation in USDA, state and local conservation programs.
 - h. Field Office Technical Guides customized for local soil and conditions are available to enable better production and conservation measures by producers.⁷²

CORN SUSTAINABILITY VERIFICATION

Sustainable Corn Exports LLC

With the purpose of responding to the interest expressed by corn buyers and export markets of better understanding the sustainability practices of U.S. corn production, the U.S. Grains Council constituted a standalone legal entity to operate a web platform associated to the Corn Sustainability Assurance Protocol (CSAP): Sustainable Corn Exports LLC.

This organization is responsible for:

- Annually determining the total amount of U.S. corn in compliance with the CSAP, based on the minimum verification threshold established for U.S. sustainable corn eligibility (i.e., participation in USDA Farm Service Agency programs, and the submission of the annual internal audit of compliance with the Highly Erodible Land Conservation and Wetland Conservation provisions- Form AD1026).
- Determining the total amount of U.S. corn eligible for allocation under CSAP by using the total number of qualified corn acres meeting the minimum sustainability verification threshold, and the national average yield per acre.
- Establishing and maintaining the website for interested and eligible corn buyers to register online and request a shipment-specific **record of sustainability (ROS)**, which validates product eligibility under the CSAP for each shipment of corn.
- Maintaining a recordkeeping system via an internet-accessible database (the Database), which will be used to verify that U.S. corn exported under the CSAP is compliant and recorded.

Issuance of Record of Sustainability

- Shippers using the Database will establish and maintain a firm-specific record that will provide the necessary information for a uniquely identified record of sustainability (ROS) to accompany individual U.S. corn exports.
- For a shipper or exporter desiring to transport corn covered by a ROS, it must:
 - Register as a user of the Corn Sustainability Assurance Protocol.
 - Establish a Shipper-specific and secure record on the Database.
 - Document shipment-specific information on the Shipper-specific secure record.
 - The record created and maintained by the Shipper will include, at a minimum, the volume and date of shipment of corn from the U.S.; with the option for the Shipper to include additional information.
 - Agree to allow Sustainable Corn Exports LLC access to the volume and date of shipment of corn from the U.S.
- Each shipment of U.S. corn covered by this Protocol will be accompanied by a uniquely identified (numbered) shipment-specific document containing selected information from the shippers' record, and a Sustainable Corn Exports LLC validation of the mass balance accounting method chain of custody from a volume of protocol-compliant corn meeting the minimum sustainability verification threshold.
- Under the logic of a mass balance approach for the CSAP, the total volume of records of sustainability issued each year will never exceed the annual volume of Protocol-complaint corn entered into the Database.
- Sustainable Corn Exports LLC will use the volume and date of shipment of corn from the U.S.

to manage and provide necessary reporting on the Protocol. Sustainable Corn Exports will also maintain the website and an alternative/back-up system for document issuance and recordkeeping if the web-based system is not available.

- There is no cost to any of the parties for the use of the Sustainable Corn Exports web-platform or for the issuance and use of the respective Records of Sustainability.

SUSTAINABILITY GOALS FOR U.S. CORN INDUSTRY: CONTINUOUS IMPROVEMENT

Corn farmers in the U.S. are the largest single sector of agriculture, with over 90 million acres planted annually. Small farm-scale improvements have major national impacts across environmental, social, and economic indicators of sustainability. The National Corn Growers Association (NCGA) is the largest grower representative group for these farmers. They are a grower-led organization that represents over 330,000 growers through state-affiliated organizations.

Commitments to sustainability from NCGA include founding membership in Field to Market: The Alliance for Sustainable Agriculture™, and support of sustainability initiatives in beef, poultry, pork and dairy sectors. Building on the work of Field to Market, and in collaboration with other cropping systems such as soybeans and cotton, in June 2021 NCGA released its first Corn Sustainability Report,⁷³ in which U.S. corn producers evaluated environmental performance over 5 sustainability impact categories and developed a set of performance goals for 2030 (below). These goals represent the potential for improvement in corn production with current rates of increase in the adoption of current technology.

Through the CSAP, USGC gives visibility to NCGA’s five environmental national efficiency goals to further enhance sustainable corn production, as well as to the Field to Market National Indicators Report, which is updated over a five-year cycle, peer-reviewed and serves as benchmark and assessment of performance.

U.S. Corn Farmers Sustainability Statement

U.S. Corn farmers are committed to continuous improvement in the production of corn, a versatile crop providing abundant high-quality food, feed, renewable energy, biobased products, and ecosystem services. As stewards of the land, we understand the responsibility we have for creating a more environmentally and economically sustainable world for future generations with transparency and through continued advances and efficiencies in land, water and energy use.

NCGA'S GOALS

BY 2030

<p>INCREASE LAND USE EFFICIENCY BY</p> <h1 style="color: #00a6c9;">12%</h1>	<p>REDUCE SOIL EROSION BY</p> <h1 style="color: #00a6c9;">13%</h1>	<p>INCREASE IRRIGATION WATER USE EFFICIENCY BY</p> <h1 style="color: #00a6c9;">15%</h1>
<p>INCREASE ENERGY USE EFFICIENCY BY</p> <h1 style="color: #00a6c9;">13%</h1>	<p>REDUCE GHG EMISSIONS BY</p> <h1 style="color: #00a6c9;">13%</h1>	



Field to Market
The Alliance for Sustainable Agriculture



Benchmarking
Corn farmer adoption of technology and improvements to resource management are measured through established sustainability metrics.



Catalyzing
Farmers voluntarily join in initiatives within the supply chain to garner more information and meet specific sustainability needs of their customers.



Enabling Claims
Through the field-print calculator, farmers submit individual information that is then aggregated into regional data for supply chain partners to use when measuring their sustainability imprint.

Source: National Corn Growers Association Sustainability Commitment and Goals, NCGA 2021 Sustainability Report, <https://bit.ly/3KxATAm>. Reduction commitments are set using a 2020 baseline.

END NOTES

- ¹ <https://grains.org/about/about-the-council/mission-and-values/>
- ² <https://www.ncga.com/about-ncga/who-we-are/mission-and-vision>
- ³ <https://fieldtomarket.org/>
- ⁴ Matlock, M.D., 2016. A Continuous Improvement Framework for Sustainable Agricultural Production. ANSI/ASABE 629 Standards of Practice, ASA- BE, St. Joseph, MI
- ⁵ National Corn Growers Association, Corn Sustainability Report 2021, <https://dt176nijwh14e.cloudfront.net/file/392>
- ⁶ Field to Market: The Alliance for Sustainable Agriculture, 2021. Environmental Outcomes from On-Farm Agricultural Production In the United States (Fourth Edition). ISBN: 978-0-578-33372-4.
- ⁷ Field to Market: The Alliance for Sustainable Agriculture, 2021. Environmental Outcomes from On-Farm Agricultural Production In the United States (Fourth Edition). ISBN: 978-0-578-33372-4.
- ⁸ <https://calculator.fieldtomarket.org/>
- ⁹ United Nations, Department of economic and Social affairs: Sustainable Development, The 17 Goals, <https://sdgs.un.org/goals>
- ¹⁰ USDA NRCS. Energy Tools. Webpage, version: 2.2.0.623. <https://energytools.sc.egov.usda.gov/>
- ¹¹ USDA NRCS. Energy Self Assessment. Webpage. <http://www.ruralenergy.wisc.edu/>
- ¹² USEPA. Summary of the Clean Air Act. [Laws and Regulations Summary]. <https://www.epa.gov/laws-regulations/summary-clean-air-act>
- ¹³ USEPA. Summary of the Clean Water Act. [Laws and Regulations Summary]. <https://www.epa.gov/laws-regulations/summary-clean-water-act>
- ¹⁴ USEPA. National Pollutant Discharge Elimination System (NPDES). [Permit Program Information Portal]. <https://www.epa.gov/npdes>
- ¹⁵ USEPA and US Department of the Army. Memorandum: Clean Water Act Section 404 Regulatory Program and Agricultural Activities. [Memorandum]. <https://www.epa.gov/cwa-404/cwa-section-404q-memorandum-agreement-between-epa-and-department-army-text>
- ¹⁶ USEPA. Safe Drinking Water Act (SDWA). [Laws and Regulations Overview] <https://www.epa.gov/sdwa/overview-safe-drinking-water-act>
- ¹⁷ USDA NRCS. Conservation Compliance for Highly Erodible Lands. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/farm-bill/?cid=nrcseprd1542214>
- ¹⁸ U.S. Department of Agriculture, Farm Service Agency, Highly Erodible Land Conservation (HELIC) and Wetland Conservation (WC) Certification, Form AD-1026 [Form]. <https://www.farmers.gov/sites/default/files/documents/Form-AD1026-Highly-Erodible-Land.pdf>
- ¹⁹ USDA. Native Sod Provisions. July 2019. [FAQ]. <https://www.rma.usda.gov/en/Fact-Sheets/National-Fact-Sheets/Native-Sod-Guidelines-for-Federal-Crop-Insurance>
- ²⁰ U.S. Fish and Wildlife Service. Endangered Species Act of 1973 <https://www.fws.gov/law/endangered-species-act>
- ²¹ U.S. Fish and Wildlife Service.. Habitat Conservation Plans. <https://fws.gov/service/habitat-conservation-plans>
- ²² USEPA and US Department of the Army. Memorandum: Clean Water Act Section 404 Regulatory Program and Agricultural Activities. [Memorandum]. <https://www.epa.gov/cwa-404/cwa-section-404q-memorandum-agreement-between-epa-and-department-army-text>
- ²³ U.S. Department of Agriculture, Farm Service Agency, Highly Erodible Land Conservation (HELIC) and Wetland Conservation (WC) Certification, Form AD-1026 [Form]. <https://www.farmers.gov/sites/default/files/documents/Form-AD1026-Highly-Erodible-Land.pdf>
- ²⁴ USDA NRCS. Wetlands Conservation Provisions. (Swampbuster). [Conservation Programs]. <https://www.epa.gov/cwa-404/permit-program-under-cwa-section-404>
- ²⁵ USDA FSA. Farmable Wetlands Program. [Conservation Programs]. <https://www.fsa.usda.gov/programs-and-services/conservation-programs/farmable-wetlands/index>
- ²⁶ USDA NRCS. Wetland Reserve Easements. [Conservation Programs]. <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcseprd416653>
- ²⁷ USDA NRCS. Agricultural Conservation Easement Program (ACEP). [Conservation Programs]. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/>
- ²⁸ United States. Parks, Forests, and Public Property, Land Uses, 36 C.F.R. Part 251.53

-
- ²⁹ USDA NRCS. Healthy Forest Reserve Program. [Conservation Programs]. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/>
- ³⁰ USDA NRCS. Agricultural Conservation Easement Program (ACEP). [Conservation Programs]. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/>
- ³¹ Oswalt, Sonja N.; Miles, Patrick D.; Pugh, Scott A.; Smith, W. Brad. 2018. Forest Resources of the United States, 2017: a technical document supporting the Forest Service 2020 update of the RPA Assessment. Gen. Tech. Rep. WO-xxx. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office., Table 1a, page 5, https://www.fia.fs.fed.us/program-features/rpa/docs/2017RPAFIATABLESFINAL_050918.pdf
- ³² United States. Federal Seed Act. 7 C.F.R. Part 201. <https://www.ams.usda.gov/sites/default/files/media/Federal%20Seed%20Act.pdf>
- ³³ United States. Plant Protection Act. 7 C.F.R. Part 104.
- ³⁴ USDA, FDA, EPA. The Unified Website for Biotechnology Regulation. [Framework Overview]. <https://usbiotechnologyregulation.mrp.usda.gov/biotechnologygov/home/>
- ³⁵ USDA. Animal and Plant Health Inspection Service. [Website]. <https://www.aphis.usda.gov/aphis/home/>
- ³⁶ USEPA. Occupational Pesticide Safety and Health. [Website]. <https://www.epa.gov/pesticide-worker-safety>
- ³⁷ USEPA. Summary of the Federal Insecticide, Fungicide, and Rodenticide Act. [Laws and Regulations summary]. <https://www.epa.gov/laws-regulations/summary-federal-insecticide-fungicide-and-rodenticide-act>
- ³⁸ USEPA. Summary of the Toxic Substances Control Act. [Laws and Regulations Summary]. <https://www.epa.gov/laws-regulations/summary-federal-insecticide-fungicide-and-rodenticide-act>
- ³⁹ USEPA. Summary of the Resource Conservation and Recovery Act. [Laws and Regulations Summary]. <https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview>
- ⁴⁰ USEPA. Safe Drinking Water Act (SDWA). [Laws and Regulations Overview]. <https://www.epa.gov/sdwa>
- ⁴¹ USEPA. Summary of the Clean Water Act. [Laws and Regulations Summary]. <https://www.epa.gov/laws-regulations/summary-clean-water-act>
- ⁴² USEPA. National Pollutant Discharge Elimination System (NPDES). [Permit Program Information Portal]. <https://www.epa.gov/npdes>
- ⁴³ Office of Department of Labor. Fair Labor Standards Act (FLSA). [Regulation overview]. <https://www.dol.gov/agencies/whd/flsa>
- ⁴⁴ U.S. Equal Employment Opportunity Commission. [Laws and Guidance]. <https://www.eeoc.gov/laws-guidance>
- ⁴⁵ U.S. Department of Labor, Wage and Hour Division. Migrant and Seasonal Agricultural Worker Protection Act (MSPA). [Regulation overview]. <https://www.dol.gov/agencies/whd/agriculture/mspa>
- ⁴⁶ International Labour Organisation. International Labour Office. Elimination of All Forms of Forced or Compulsory Labor. June 1957. https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C105
- ⁴⁷ U.S. Department of Homeland Security. Human Trafficking Laws and Regulations. September 2019. [Laws and Regulations List]. <https://www.dhs.gov/human-trafficking-laws-regulations>
- ⁴⁸ U.S. Department of Labor. Bureau of International Labor Affairs. What Are Workers' Rights? [Regulation Summary]. <https://www.dol.gov/agencies/whd/workers>
- ⁴⁹ USEPA. Occupational Pesticide Safety and Health. [Website]. <https://www.epa.gov/pesticide-worker-safety>
- ⁵⁰ USEPA. Summary of the Federal Insecticide, Fungicide, and Rodenticide Act. [Laws and Regulations summary]. <https://www.epa.gov/laws-regulations/summary-federal-insecticide-fungicide-and-rodenticide-act>
- ⁵¹ United States Department of Labor. Occupational Safety and Health Administration. [Webpage]. <https://www.osha.gov/>
- ⁵² USEPA. Summary of the Clean Air Act. [Laws and Regulations Summary]. <https://www.epa.gov/laws-regulations/summary-clean-air-act>
- ⁵³ USEPA. Summary of the Resource Conservation and Recovery Act. [Laws and Regulations Summary]. <https://www.epa.gov/rcra/resource-conservation-and-recovery-act-rcra-overview>
- ⁵⁴ USEPA. Safe Drinking Water Act (SDWA). [Laws and Regulations Overview]. <https://www.epa.gov/sdwa>
- ⁵⁵ U.S. Department of the Interior, Bureau of Land Management (editor), 2016. The Federal Land Policy and Management Act of 1976, as amended. U.S. Department of the Interior, Bureau of Land Management, Office of Public Affairs, Washington, DC. 106 pp.
- ⁵⁶ USDA, NRCS, American Farmland Trust, Farmland Information Center <https://www.nal.usda.gov/afsic/farmland-preservation-and-farm-transition-> Farmland Information Center (FIC), webpage. <https://farmlandinfo.org/>

-
- ⁵⁷ USDA, NRCS, Agricultural Conservation Easement Program webpage <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/>
- ⁵⁸ American Farmland Trust, webpage. <https://farmland.org/>
- ⁵⁹ USEPA. Emergency Planning and Community Right-to-Know Act (EPCRA). [Regulation Information Website]. <https://www.epa.gov/epcra>
- ⁶⁰ USEPA. How's My Waterway, <https://www.epa.gov/waterdata/how-s-my-waterway>
- ⁶¹ <https://4-h.org/>
- ⁶² <https://www.ffa.org/>
- ⁶³ USDA, Foreign Agricultural Service, Programs. website. <https://www.fas.usda.gov/programs>
- ⁶⁴ USDA NRCS. Alphabetical Listing and Archive of NRCS Programs and Activities. [List]. https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/?&cid=nrcs143_008525
- ⁶⁵ USGS, Western Geographic Science Center, Ongoing research in Global Hyperspectral Imaging Spectral-library of Agricultural-Crops (GHISA), webpage. https://www.usgs.gov/centers/western-geographic-science-center/science/global-hyperspectral-imaging-spectroscopy?qt-science_center_objects=0#qt-science_center_objects
- ⁶⁶ USDA, FSA. Conservation Reserve Program. <https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index>
- ⁶⁷ NRCS Program Staff email on current CSP acreage enrollment, June 3, 2021
- ⁶⁸ U.S. Department of Agriculture. Financial Management Modernization Initiative (FMMI) 2012-2019 Data October 2019. Foundation Financial Information System (FFIS) 2009-2011 Data. ProTracts Program Contracts System October 2019. National Planning and Agreements Database (NPAD) October 2019. Natural Resources Conservation Service, Washington, DC. 31 March 2020 <https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>
- ⁶⁹ USDA NRCS. 2020.
- ⁷⁰ USDA NRCS. Conservation Effects Assessment Project (CEAP). [Program Overview]. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/>
- ⁷¹ USDA NRCS. Landscape Conservation Initiatives: Conservation Beyond Boundaries. [Initiatives Portal]. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/initiatives/>
- ⁷² USDA NRCS. Field Office Technical Guide (FOTG). [Technical Resource]. <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>
- ⁷³ National Corn Growers Association, Corn Sustainability Report 2021, <https://dt176nijwh14e.cloudfront.net/file/392>