

The Core 4 Conservation report card evaluates the U.S. agricultural community's progress toward the Core 4 Conservation goals of better soil, cleaner water, greater profits and brighter future. Core 4 Conservation is a Conservation Technology Information Center-coordinated initiative that helps producers increase profits while protecting natural resources. Following the principles of Core 4 Conservation, producers implement an integrated management system of land treatment practices that will better manage inputs, reduce polluted runoff, improve soil quality and enhance water quality. The practices, such as conservation tillage, crop nutrient management, pest management, conservation buffers and other site-specific practices, are combined appropriately to match local conditions, individual farm size and management capabilities and financial conditions of the producer.

Scientists estimate that using the Core 4 Conservation approach can reduce pollutants in runoff from cropland by as much as 80 percent. Based on government reports, research and expert consultation, the Core 4 Conservation annual progress report comments on agricultural community – public and private – efforts undertaken to manage agricultural production for better soil, cleaner water, greater profits and a brighter future.

Better Soil

C+

Strengths

The 1997 Natural Resources Inventory (NRI), released in December by the USDA Natural Resources Conservation Service, reports soil erosion rates have remained steady since 1995 at nearly 1.9 billion tons a year, an average of more than 5 tons per acre on cropland. In many regions of the country, reduction in soil loss can be attributed to adoption of conservation tillage practices and the establishment of permanent cover (grass and/or trees) on cropland. For the past five years, approximately 37 percent of the 293 million acres of cropland planted every year in the U.S.

used conservation tillage. CTIC's goal is to increase adoption of conservation tillage practices to 60 percent of planted acres by 2005. Permanent cover has been established on more than 40 million acres by local, state and federal conservation programs. More than 32 million acres are enrolled in the USDA Conservation Reserve Program, including 742,000 miles of conservation buffers. In addition to reducing soil loss and improving soil quality, conservation tillage and permanent cover sequester carbon and reduce emissions of carbon dioxide into the atmosphere.

Weaknesses

The NRI reports an excessive erosion rate of nearly 12 tons an acre on 112 million acres of cropland (1.3 billion tons of soil lost a year). Eroding cropland sends sediment and attached pesticides or nutrients to water bodies, affecting water quality as well. Although 50 percent of cropland acres are suitable for some form of conservation tillage to mitigate soil loss, no-till is used on 16 percent and continuous no-till (more than five years) is used on only 7-10 percent of total cropland acres.

Suggested areas for improvement

Increase adoption of conservation tillage practices. Conservation tillage improves infiltration, increases soil organic matter and provides wildlife habitat. Continuous no-till can reduce erosion up to 90 percent over intensive tillage systems. In addition, no-till, cover crops and permanent cover can increase sequestration of carbon and reduce carbon dioxide emissions.

Establish more conservation buffers. Conservation buffers can capture 75 percent of sediment and help keep soil on cropland. Buffers also can capture 50 percent of nutrients and pesticides and 60 percent of pathogens in runoff. Other benefits include providing wildlife habitat and capturing carbon.

Cleaner Water

C

Strengths

Regulation of point source discharges of waste from factories and sewage treatment plants has reduced pollution inputs and improved water quality in many watersheds. Current local, state and federal soil and water conservation programs target the control and reduction of nonpoint source (NPS) pollution, the nation's leading cause of water quality problems. And, the 742,000 miles of conservation buffers installed since 1997 have helped slow and filter polluted runoff before it reaches waterways.

Weaknesses

A majority of states name agriculture as a leading source of NPS pollution and identify sediment, nutrients, pesticides, salts and pathogens as ag-related pollutants that affect water quality. Excessive erosion, documented by the NRI, occurs on more than 60 million acres of highly erodible cropland and nearly 52 million acres of non-highly erodible cropland.

Although NPS pollution programs exist, few at any level address all impaired water bodies and most lack adequate funds. The U.S. Environmental Protection Agency has reported that approximately one-third of monitored river miles, lake areas and other water bodies do not fully support their designated uses. Additional water quality monitoring data are needed to address specific local needs.

The increasing rate of urban sprawl complicates efforts to manage and reduce NPS pollution. The NRI reports the national rate of development from 1992 to 1997 more than doubled to 3 million acres a year. Expanding urbanization and development divides agricultural land and removes prime farmland from production.

Suggested areas for improvement

Better management of nutrients in crop and livestock operations. Nutrient management planning integrates all nutrient inputs so that production risks and environmental risks are minimized. The more nutrients a crop converts to grain or fiber, the fewer nutrients are likely to run off. Comprehensive nutrient management plans (including feed rations, manure storage and land application) soon will be required for certain confined livestock operations. Also, states are establishing EPA-mandated Total Maximum Daily Loads (TMDLs) for water bodies that haven't met water quality standards. (A TMDL is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.)

Control erosion and runoff to protect water quality. Best Management Practices (BMPs) for water quality are the same as or similar to BMPs that reduce erosion and sediment transport to lakes, rivers and streams. Conservation tillage systems used in areas with excessive erosion can help reduce soil loss, improve soil quality, sequester carbon and prevent sediment from reaching nearby waterways. In addition, microbes that live in carbon-rich soils degrade pesticides and utilize nutrients, preventing some pollutants from reaching groundwater.

Establish more conservation buffers. Buffer strips strategically placed in the agricultural landscape can mitigate the movement of sediment, nutrients and pesticides within farm fields and at edge of field to prevent pollutants from reaching lakes, rivers and streams. Buffers also can improve air quality, reduce noise, disperse odors and enhance wildlife habitat and diversity.

Implement integrated pest management (IPM) systems. Integrated Pest Management systems efficiently use effective formulations of pesticides only when and where they are needed. Rotating the use of alternative pest management methods, including biological controls and

beneficial organisms, can prevent or delay pest resistance. By using pesticides and cultivation only when necessary, producers help reduce agriculturally polluted runoff and protect their watershed. Although current IPM system usage is not documented, CTIC aims to increase adoption of IPM practices to 75 percent of cropland acres.

across the field for planting and fewer hours on a tractor. On 500 acres, for example, a producer could save as much as 225 hours a year or nearly four 60-hour weeks. Fewer trips save an estimated \$5 an acre on machinery wear and maintenance costs—a \$2,500 savings on a 500-acre farm. Conservation tillage also saves an average of 3.5 gallons an acre or 1,750 gallons on a 500-acre farm.

Greater Profits **C**

Strengths

The 1996 Farm Bill provided “Freedom to Farm,” which allowed producers to plant crops based on marketplace opportunities instead of government programs. In 1999, some producers took advantage of advance marketing opportunities and government programs and realized “good” profits. Producers willing to adopt precision farming techniques have better managed inputs, saved money, improved efficiency and identified appropriate agricultural management practices.

Weaknesses

Current low commodity prices have generated low profits for some producers. Commodity supports, which could be phased out by 2002, continue in record quantities to support some producers. Many medium-sized farms, however, have been forced to close, in most cases as a result of farm consolidation. Although alternative management options exist, many producers resist changing their operation because of perceived risks.

In global markets, the world food supply surplus and the Asian economic decline reduced exports and lowered prices.

Suggested areas for improvement

Increase adoption of agricultural management systems. Agricultural management systems can increase producers profitability by reducing inputs and identifying unproductive areas. Conservation tillage requires as little as one trip

By using a management plan to analyze the crop nutrient management portion of a production system, risks can be reduced and profits maximized.

Pest management can help schedule required pest controls at the right place and time to maximize the benefits of the practice. Fewer pesticide applications, at reduced rates, with the safest and most effective formulations are used. Scouting, also a part of a pest management system, helps avoid unexpected pest outbreaks, which can cause heavy losses if not caught and treated at the right time.

Establish stewardship incentive programs. Stewardship incentive programs, or green payments, are another potentially significant alternative income source for producers. Conservation buffers provide income from local, state and federal programs in the form of rental payments and tax incentives. Buffers reduce crop losses from flooding and protect soil from erosion in vulnerable areas. Additional and improved enhancement programs are needed to promote the establishment of buffers, including wetlands and other permanent vegetation.

Brighter Future **B**

Strengths

Agriculture is changing rapidly, and with change comes opportunity. American’s agriculture is moving toward sustainable food production and a healthy environment.

The world population, currently at 6 billion people, is

expected to increase by 1.3 billion people in the next 25 years. This increasing population will require a greater food and fiber supply, but land available for production actually is decreasing. Technological improvements and precision farming advancements are expanding management capabilities and enabling producers to do more with less.

Instead of raising a generic commodity, producers may be raising specialized crops for specific traits and selling them at a premium. Government programs may shift to a stewardship incentive or green ticket approach, which rewards farmers and ranchers for implementing conservation practices.

Weaknesses

The number of producers will continue to decrease and the size of farms will continue to increase, but those who can manage the change will have tremendous opportunities.

Suggested areas for improvement

New technological advances occur daily, particularly in the area of information exchange between and among agricultural interests. Many producers utilize the wide variety of high-tech support mechanisms, such as precision farming and internet-oriented purchasing and marketing. These new information tools help producers decrease their input costs and generate greater returns.

Agriculture as a whole can benefit from increased involvement in conservation and stewardship activities that benefit not only themselves and their immediate properties, but also their neighbors and communities, now and in the future. For example, pending legislation proposes USDA payments to producers based on the amount of stewardship practices on their land. If this bill were enacted, farmers would benefit financially for their environmental stewardship.

The nation's agricultural community has made moderate progress toward better soil, cleaner water, greater profits and a brighter future. Much more work needs to be done to ensure that America's producers can improve their livelihood, be a steward of the land for the next generation and protect the resources upon which we all depend. Working within the Core 4 Conservation approach is the first step.

More information about the information contained in this report and about Core 4 Conservation is available at www.core4.org. CTIC is a national nonprofit alliance dedicated to the transfer of information and technology about agricultural conservation. CTIC's mission is to develop public/private partnerships that promote soil and water quality and equip agriculture with realistic, affordable and integrated management solutions. CTIC's web page is www.ctic.purdue.edu.

Resources

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