

November 2010

AGRICULTURAL CHEMICALS

USDA Could Enhance Pesticide and Fertilizer Usage Data, Improve Outreach, and Better Leverage Resources



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Why GAO Did This Study

The use of pesticides and fertilizers contributes to U.S. agricultural productivity and helps ensure a generally stable, plentiful, and inexpensive food supply. However, these chemicals may also harm human health, water quality, and food safety. The U.S. Department of Agriculture's (USDA) National Agricultural Statistics Service (NASS) collects, analyzes, and disseminates Agricultural Chemical Usage (ACU) data to meet regulatory, business, and other informational needs. In fiscal years 2007 through 2009, NASS substantially scaled back the ACU program before restoring it in 2010. GAO was asked to examine (1) what factors NASS considered in reducing the ACU program; (2) how ACU data users were affected by the temporary cutback, and their views on the data's quality and usefulness; and (3) the extent to which agricultural pesticide and fertilizer usage data are available from sources other than NASS. GAO reviewed relevant NASS documents and interviewed NASS officials as well as 25 selected ACU data users.

What GAO Recommends

GAO recommends, among other things, that NASS establish a formal mechanism to identify and consult ACU data users on an ongoing basis and that NASS identify and evaluate other publicly available agricultural chemical usage data sources to better leverage resources and reduce potential overlap. USDA agreed with GAO's recommendations and noted specific actions it will take to implement them.

View [GAO-11-37](#) or key components. For more information, contact Lisa Shames at (202) 512-3841 or shamesl@gao.gov.

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What GAO Found

Operating under the constraints of a continuing resolution in fiscal year 2007, NASS considered a number of factors in reducing the ACU data program. These factors included NASS's assessment that there would be no impact on the agricultural commodities market and that chemical usage data were available from other sources. However, the agency did not consult ACU data users in its decision making or gauge the potential impact of the program's cutback on users' regulatory, business, and other needs for the data. Federal guidance directs agencies managing information to consult, and consider the effects of decisions on, data users, yet NASS officials told GAO they did not formally communicate with users until the 2007 budget was finalized. NASS officials also said that they had limited information on who used ACU data and why, which hampered the agency's ability to gauge the impact of the program's reduction. The ACU data users GAO interviewed said they generally disagreed with NASS's decision factors because they perceived the factors to be irrelevant or misapplied to the ACU program.

Most users told GAO they relied on older ACU data during the program's reduction, which hindered their ability to make informed decisions because agricultural chemical use can change from year to year due to the emergence of new pests, weather variations, changing market conditions, and other factors. All 25 users also said they regard ACU data to be high quality and generally useful for their purposes, but they identified some areas for enhancing the data. Specifically, nearly all users said the ACU data would be even more useful if the data were disseminated more frequently, in greater geographic detail, or with additional data elements. Toward that end, NASS has entered into cooperative agreements with some states to provide additional ACU data, but the agency's ability to enter into such agreements may not be widely known by state agency officials due to limited outreach by NASS. In addition, ACU reports, data tools, and related resources on NASS's Web site are difficult to locate, and the online data tools are incomplete, which hampers users' ability to access and use ACU data. While NASS has several mechanisms to gather input from its data users, such as general comment forms on NASS's Web site, most users indicated these mechanisms are not effective in ensuring ACU data continue to meet their needs.

Agricultural pesticide and fertilizer usage data are also available through several state, private, and other sources. These data sources vary in their cost, geographic and crop coverage, level of detail, and other attributes. While many ACU data users reported that they rely on other sources to supplement NASS's data, nearly all emphasized that other sources do not replace ACU data. These users said, and GAO found, that NASS is the only source of publicly available data reflecting the actual application of pesticides and fertilizers on a wide array of crops on a national scale. However, NASS has not systematically identified and evaluated other publicly available data sources. As a result, the agency does not have assurance that it is fully leveraging limited government resources, maximizing efficiencies, and minimizing potential overlap in its ACU data collection.

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Abbreviations

AAPCO	Association of American Pesticide Control Officials
AAPFCO	Association of American Plant Food Control Officials
ACU	Agricultural Chemical Usage
ADA	Arizona Department of Agriculture
APMC	Arizona Pest Management Center
CDMS	Crop Data Management Systems
CDPR	California Department of Pesticide Regulation
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FQPA	Food Quality Protection Act of 1996
FSA	Farm Service Agency
IDALS	Iowa Department of Agriculture and Land Stewardship
MDA	Minnesota Department of Agriculture
NASDA	National Association of State Departments of Agriculture
NASS	National Agricultural Statistics Service
NRCS	Natural Resources Conservation Service
OMB	Office of Management and Budget
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WSDA	Washington State Department of Agriculture

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United States Government Accountability Office
Washington, DC 20548

November 4, 2010

The Honorable Brad Miller
Chairman
Subcommittee on Investigations and Oversight
Committee on Science and Technology
House of Representatives

The Honorable Lynn Woolsey
House of Representatives

The use of pesticides and fertilizers contributes to U.S. agricultural productivity and helps ensure a generally stable, plentiful, and inexpensive food supply. Over the last 40 years, according to an industry group, the use of such agricultural chemicals—an industry with more than \$24 billion in sales in 2007—has helped increase U.S. crop productivity by as much as 50 percent. However, the use of agricultural chemicals may also harm human health, water quality, animal and plant species, and food safety. For example, atrazine, one of the most widely used pesticides in the United States, has been found to be a common contaminant in drinking water and waterways and may harm aquatic plants and invertebrates. In addition, fertilizers contain nitrate, which can contaminate the groundwater that provides drinking water for over 100 million Americans and can harm infants and pregnant women. Consequently, federal agencies such as the U.S. Environmental Protection Agency (EPA), state agencies, chemical manufacturers, commodity groups, public interest organizations, academic researchers, and others monitor the extent, amount, or frequency of agricultural chemicals applied on U.S. crops. These entities use the U.S. Department of Agriculture’s (USDA) Agricultural Chemical Usage (ACU) data, which are collected, analyzed, and disseminated by USDA’s National Agricultural Statistics Service (NASS), to meet regulatory, business, and other informational needs.

NASS reports ACU data for selected states and crops, aggregated at the individual state level and at a combined “program states” level for all states covered by a given survey. ACU data elements include the number of planted acres, percentage of planted acres treated with a given chemical, amount of active ingredient applied per acre (application rate), number of applications, and total amount applied during a production year. NASS typically surveys farmers in the fall at the end of the production year and releases ACU data the following spring or summer. These data are available to the public for free and are disseminated on

NASS's Web site. From 1990 through the 2006 production year, NASS conducted in-person surveys of farmers to collect and disseminate data on the actual application on the land of agricultural pesticides and fertilizers on a wide array of major field, fruit, and vegetable crops, as well as pesticide use on livestock animals and facilities, nursery and floriculture crops, and postharvest crops in storage. NASS started collecting these data following public outcry in the late 1980s over a pesticide called Alar, a plant growth regulator formerly used on apples and other crops. Lacking information on farmers' actual application of Alar or the level of exposure risk, consumers panicked by avoiding apples and apple products, severely harming the U.S. apple industry. After EPA proposed banning the pesticide based on evidence that lifetime dietary exposure may result in an unacceptable cancer risk, the manufacturer removed Alar from the marketplace in June 1989.

According to NASS, the agency spent \$7.6 million on the ACU program in fiscal year 2006, but starting in fiscal year 2007, the ACU program was substantially scaled back because of budget constraints associated with operating under a continuing resolution.¹ As a result, NASS reported chemical usage only on apples, organic apples, cotton, and nursery and floriculture crops in fiscal year 2008, and no ACU data were reported in fiscal year 2009. After NASS made the decision to scale back the ACU program, NASS officials said the Secretary of Agriculture and other senior USDA officials received hundreds of letters, as well as many e-mails and telephone calls, from a wide range of ACU data users—including state pesticide control officials, commodity groups, chemical manufacturers and industry organizations, and public interest groups—urging the department to restore the program. Users also expressed their concern about the loss of ACU data to various congressional committees.

Subsequently, the Senate Appropriations Committee directed USDA to carry out the ACU program in fiscal year 2009 and notify the committee in advance of any termination of other ongoing NASS activities. In addition, an explanatory statement accompanying the Omnibus Appropriations Act, 2009, directed \$2.45 million to the ACU program in fiscal year 2009, and the 2010 Agriculture Appropriations conference report directed another

¹Congress enacts continuing resolutions to allow federal agencies to continue operating when their regular appropriations bills have not been enacted prior to the start of the fiscal year. Under continuing resolutions, federal agencies generally allocate funds through funding formulas frequently referenced to the previous year's appropriations act or a bill that has passed either the House or Senate—instead of a specific amount.

\$5.75 million to the program, from the agency's general appropriation. In May 2009, NASS announced its plans to conduct the fruit chemical usage survey, which was conducted that fall, and in fiscal year 2010, NASS fully restored the ACU program by resuming the field crop, nursery and floriculture, and postharvest surveys as well. Agency officials plan to continue the program in full in future years, including vegetables and potentially livestock, assuming funding remains stable.

In this context, and in response to your request, our objectives were to determine (1) the factors NASS considered in reducing the ACU program in fiscal years 2007 through 2009; (2) how ACU data users were affected by the temporary cutback, and their views on the quality and usefulness of the data; and (3) the extent to which agricultural pesticide and fertilizer usage data are available from sources other than NASS.

In conducting our work, we reviewed NASS documents, Office of Management and Budget (OMB) guidance to federal agencies managing information resources, and other relevant federal agency documents. We also interviewed NASS officials and a nongeneralizable sample of 25 ACU data users, including officials from EPA and other federal and state agencies; representatives from chemical manufacturers, commodity groups, and public interest organizations; and academic researchers. We identified the selected ACU data users through interviews with NASS officials and other users, letters written by users urging USDA to restore the ACU program, and other methods. We also reviewed NASS's controls for the information system that stores the ACU data. To determine the factors that NASS considered in reducing the program, we reviewed documents from NASS and interviewed NASS officials and the 25 selected ACU data users. To determine how the selected ACU data users were affected by the temporary cutback, and their views on the quality and usefulness of the data, we interviewed them and reviewed documents they provided. To determine the extent to which agricultural pesticide and fertilizer usage data are available from sources other than NASS, we first identified as many sources as we could through our interviews, document review, and other methods. We then distributed a questionnaire to these sources to collect information on the attributes of their data. We analyzed interviews, documents, and questionnaire responses to identify main themes and develop summary findings. For the purpose of characterizing the 25 selected ACU data users' views throughout this report, we identified specific meanings for the modifiers we used to quantify users' views, as follows: "nearly all" users represents 21 to 24 users, "most" users represents 16 to 20 users, "many" users represents 11 to 15 users, "several" users represents 6 to 10 users, and "some" users represents 3 to 5 users.

Appendix I contains a more detailed discussion of our scope and methodology, including a complete list of ACU data users we interviewed.

We conducted this performance audit from October 2009 to November 2010, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

In 1990, NASS began surveying farmers to determine the types and quantities of pesticides and fertilizers being used on selected field crops, fruits, and vegetables. NASS launched this ACU data collection to provide reliable data to improve government decisions on food safety and water quality, assist in the analysis of pesticide policies, and inform the public of the safety of the nation's food supply. Key objectives of this effort were to (1) collect comprehensive, statistically valid, and scientifically based pesticide usage data and (2) provide EPA with data that it could use in making decisions to approve (register) pesticide products. Figure 1 shows a tractor applying pesticides to a crop. Because fertilizer runoff affects water quality, agricultural fertilizer usage has also been part of the ACU program since its inception. Under the Clean Water Act, states prepare management programs to control pollution from nonpoint sources, which include agricultural runoff.

Figure 1: A Tractor Applying Pesticides to Lettuce in California



Source: USDA.

The ACU program covers selected field crops, fruits and vegetables, postharvest chemical usage, nursery and floriculture, and livestock animals and facilities, as follows:

- Field crops are surveyed annually with varying crop coverage: corn, cotton, and potatoes are surveyed in odd-numbered years; soybeans and wheat are surveyed in even-numbered years; and other field crops, including sugar beets, sugar cane, oats, peanuts, rice, and barley, are surveyed less frequently, often in conjunction with USDA's Economic Research Service.
- Fruits and vegetables are each surveyed every 2 years on an alternating schedule, and these surveys have covered a total of 25 fruits and 29 vegetables in recent years.
- The postharvest survey is done annually on selected field crops, fruits, or vegetables surveyed the prior year.

-
- The nursery and floriculture survey is conducted every 3 years and has included 19 crops in recent years.
 - The livestock survey—which has covered beef and dairy cattle, swine, and sheep in the past—is done in conjunction with USDA’s Animal and Plant Health Inspection Service, and there is no established frequency of these surveys.

All ACU surveys cover pesticide use and pest management practices, while the field crop, fruit, and vegetable surveys also cover fertilizer use. The ACU fertilizer data includes information on the four primary nutrients found in fertilizers: nitrogen, phosphate, potash, and sulfur. In addition, NASS compiles and disseminates supplemental reports on topics such as restricted-use pesticides,² which excerpt and summarize information contained in the standard ACU data disseminated in a given year.

NASS operates through a network of 46 field offices, which serve all 50 U.S. states and Puerto Rico. These field offices are generally funded and staffed with both federal and state resources, which, according to NASS, is more efficient than operating separate federal and state agencies. For each ACU survey, NASS relies on data collectors—also called enumerators—to conduct in-person interviews with farmers and to review documentation of their on-farm use of pesticides and fertilizers. Farmers provide this information voluntarily on a confidential basis. The NASS field offices oversee the data collection and analysis to produce state statistics before headquarters officials further analyze and disseminate the data. ACU data do not represent the total use of any agricultural chemical at the national or state level. Instead, NASS collects ACU data in states which collectively represent at least 75 percent, and as much as 100 percent, of the planted acres nationwide for each crop surveyed. Farms in these states that produce the crops of interest are eligible to be included in the sample surveyed and are selected on a probability basis proportional to their acreage.

ACU data users include federal agencies, state agencies, chemical manufacturers, commodity groups, public interest organizations, and academic researchers. For example, EPA’s Office of Pesticide Programs uses ACU data for its reregistration reviews, as well as to evaluate the

²A restricted-use pesticide is a pesticide that is available for purchase and use only by certified pesticide applicators or persons under their direct supervision, and only for the uses covered by the applicator’s certification.

registration of new uses for previously registered products. The Federal Insecticide, Fungicide, and Rodenticide Act gives EPA responsibility for regulating the sale and use of pesticides in the United States through evaluating and registering pesticide products; restricting the use of pesticides as necessary to protect human health and the environment; and periodically reviewing whether older pesticides continue to meet the standard for registration. In addition, the Food Quality Protection Act of 1996 (FQPA) required EPA to reassess all existing tolerances (maximum residues legally allowed) and to prioritize the review by focusing on pesticides posing the greatest risks first. FQPA also specifies that the Secretary of Agriculture should make aggregate data available to EPA that are “of statewide or regional significance on the use of pesticides to control pests and diseases of major crops and crops of dietary significance, including fruits and vegetables.” According to EPA officials, the agency completed its reregistration reassessments in 2008 and its tolerance reassessments in 2007 and is currently reviewing older pesticide registrations on an ongoing basis as part of its registration review program. Meanwhile, the sale and use of fertilizers are generally regulated at the state level. However, because EPA considers agriculture to be one of the largest sources of water pollution in the United States, and because fertilizer is a primary water quality concern, EPA’s Office of Water uses ACU data to model environmental trends at a national level and to assist states in their oversight of water quality in support of the Clean Water Act.

The Department of the Interior’s U.S. Geological Survey (USGS) also uses ACU data to analyze and model water quality data and to discern geographic patterns of agricultural pesticide usage over time. For example, USGS uses ACU data in its National Water-Quality Assessment Program, which assesses the condition of the nation’s streams, rivers, and groundwater; measures how these conditions change over time; and explores how human activities affect these conditions. As part of this program, USGS uses ACU data to measure the success of integrated pest management implementation efforts.³ Agencies within USDA, including the Economic Research Service, Office of Pest Management Policy, Farm Service Agency, Agricultural Marketing Service, and Natural Resources Conservation Service (NRCS) also use ACU data. For instance, NRCS uses the data to quantify the environmental benefits and effects of conservation

³Integrated pest management is an agricultural strategy that combines the use of chemical pesticides with a wide range of nonchemical pest management practices, such as planting pest-resistant crop varieties and protecting beneficial organisms, thereby potentially reducing reliance on pesticides.

practices used by conservation program participants to control the runoff of agricultural chemicals.

In addition, state government agencies use ACU data for a variety of purposes, including assessing pesticides' impacts on water quality and evaluating the need for special pesticide registrations and emergency exemptions.⁴ Chemical manufacturers and commodity groups use ACU data to identify industry trends and for marketing, research and development, and other business purposes. Commodity groups also use ACU data to help access foreign agricultural markets because ACU data enable them to demonstrate the types and amounts of chemicals typically used in the United States on crops grown for export. Public interest organizations use ACU data for a number of purposes, including measuring the impact of genetically engineered crops on pesticide use. Academic researchers use ACU data for a multitude of purposes, including measuring agricultural pesticide and fertilizer use to assess the environmental impact of biofuels made with agricultural products, assessing the impact of integrated pest management, and monitoring the transition to organic and sustainable agriculture. ACU data are also used to assess agriculture's contribution to climate change since, according to EPA, the nitrogen in fertilizer can form nitrous oxide, a potent greenhouse gas.

NASS Considered Five Factors but Did Not Consult Users before Reducing ACU Data Program

NASS considered five factors in significantly reducing the ACU data program in fiscal year 2007. However, the agency did not consult users in its decision making or gauge the potential impact of the program's cutback. Users subsequently told us they generally disagreed with NASS's decision factors because they perceived the factors to be irrelevant or misapplied to the ACU program.

⁴Emergency exemptions are granted to federal or state agencies by EPA and allow use of a pesticide in circumstances such as a disease outbreak that cannot be controlled by registered products, while special pesticide registrations are granted to state agencies by EPA and permit states to allow additional uses of a federally registered pesticide product to meet special local needs.

NASS Considered Five Factors in Significantly Reducing the ACU Data Program in Fiscal Year 2007

NASS considered five factors in significantly reducing the ACU data program in fiscal year 2007. Operating under the constraints of a continuing resolution and faced with \$7.25 million in increased costs related to conducting the statutorily required 2007 Census of Agriculture, a NASS senior executive team reviewed the agency's entire portfolio of programs in December 2006 and cut more than \$12 million worth of planned expenditures to balance its budget. NASS initially considered several cost-cutting measures across its portfolio—such as reducing sample sizes, the number of states covered, and the frequency of data reports—but rejected these measures because they would have reduced data quality and consistency. Instead, NASS officials said they decided to eliminate or substantially scale back certain programs that would not compromise the agency's commitment to provide high-quality data. The ACU program absorbed most of the shortfall, while other cutbacks included a freeze on NASS's hiring, travel, equipment, and training. Five other data programs were also eliminated or reduced, including quarterly farm labor surveys used by the U.S. Department of Labor and nursery and floriculture production surveys. NASS officials said that, based on an internal program review team that ranked the relative importance of the agency's data programs in 2001, the senior executive team looked at nearly 40 programs that had been identified as lower priority, including ACU and the other programs it cut.

NASS officials said that five factors determined the senior executive team's decision in fiscal year 2007 to cut ACU and the other data programs. Of those five factors, four were applied broadly, as follows:

- the data are not principal economic indicator data, as designated by OMB,⁵
- the data do not directly impact the agricultural commodities market,
- the data are not necessary to implement USDA programs that provide payments to farmers and are used to administer the farm safety net, and
- there are other data sources available.

⁵OMB Statistical Policy Directive Number 3, "Compilation, Release, and Evaluation of Principal Federal Economic Indicators," governs the release of principal economic indicators, which are statistical series that provide timely measures of economic activity and that are compiled and released by federal agencies. 50 *Fed. Reg.* 38,932 (Sept. 25, 1985).

In addition, in its decision to cut the ACU program specifically, NASS officials stated another factor weighed heavily:

- a 2006 NASS advisory subcommittee had stated “not only is expansion of NASS pesticide use data unfeasible, but support for the program in its current state is quite soft.”⁶

In February 2007, when NASS received an additional \$7 million in the final budget, the agency restored some of the data program cuts, including \$800,000 for the ACU nursery and floriculture survey conducted that year. However, NASS did not reinstate the ACU field crop, fruit, vegetable, and postharvest surveys that originally had been planned for the 2007 and 2008 production years. In NASS’s view at that time, the agency would have needed an additional \$7.6 million to fully restore the ACU program to its 2006 level and, in the absence of such funding, NASS planned to survey in future years a limited number of crops’ chemical usage every 5 or 6 years, and other crops even less frequently.

NASS Did Not Consult ACU Data Users to Gauge the Potential Impact of the Program’s Cutback

OMB guidance directs federal agencies managing information to consult with, and consider the effects of decisions and actions on, the public and state and local governments.⁷ However, all 25 ACU data users we interviewed indicated, and NASS officials confirmed, that users were not consulted before or after NASS’s decision to cut the ACU program, and therefore the agency did not assess how users would be affected by the lack of data. For example, officials from the National Association of State Departments of Agriculture (NASDA)—which represents state agencies who use the data and, under contract with NASS, hires the enumerators to conduct the ACU surveys—said NASS did not consult them. If they had been consulted, the NASDA officials stated, they would have argued that states need the data to make regulatory and other decisions pertaining to pesticides and pest management. Similarly, officials from EPA and the Association of American Pesticide Control Officials (AAPCO)—which

⁶The 2006 subcommittee’s objectives were to consider whether there was (1) interest in creating an integrated national system for pesticide use data collection and distribution combining public and private sources of data; (2) a compelling problem with pesticide use data availability or coverage that is currently unaddressed by available pesticide use data sources; and (3) a groundswell of support for a major increase in public funding for federal pesticide use data collection.

⁷Office of Management and Budget, Executive Office of the President, OMB Cir. No. A-130, Transmittal Memorandum #4, Management of Federal Information (Nov. 28, 2000).

represents state officials who regulate pesticide use in their respective states—indicated they were not consulted by NASS and were taken by surprise. Nearly all data users learned of the decision after the fact through informal communication with NASS officials or from other data users in 2007 and 2008. Several users said they also learned of the decision through official notices in the *Federal Register* that NASS published in May 2007 and March 2008. By then, however, the 2007 budget—and therefore the decision to cut the ACU program—was final.

NASS officials told us that, as is common practice for federal agencies operating under a continuing resolution, they did not formally communicate the agency’s decision to users until the 2007 budget was finalized. We have previously reported that operating under continuing resolutions has created management challenges for federal agencies, including limiting their decision making options and making trade-offs more difficult.⁸ In addition, NASS officials said that due to the publicly available nature of their data, they had limited information on who used ACU data and why. As a result, the agency’s ability to gauge the potential impact of the program’s reduction on users’ regulatory, business, and other needs for the data was hindered. While NASS had been aware, prior to the cut, that ACU data were used by other USDA agencies, EPA, and commodity groups, there was an outpouring of support for the program that ensued from a wide range of users, including organizations representing state agencies, chemical manufacturers, and public interest groups.

Users Generally Perceived NASS’s Decision Factors to Be Irrelevant or Misapplied

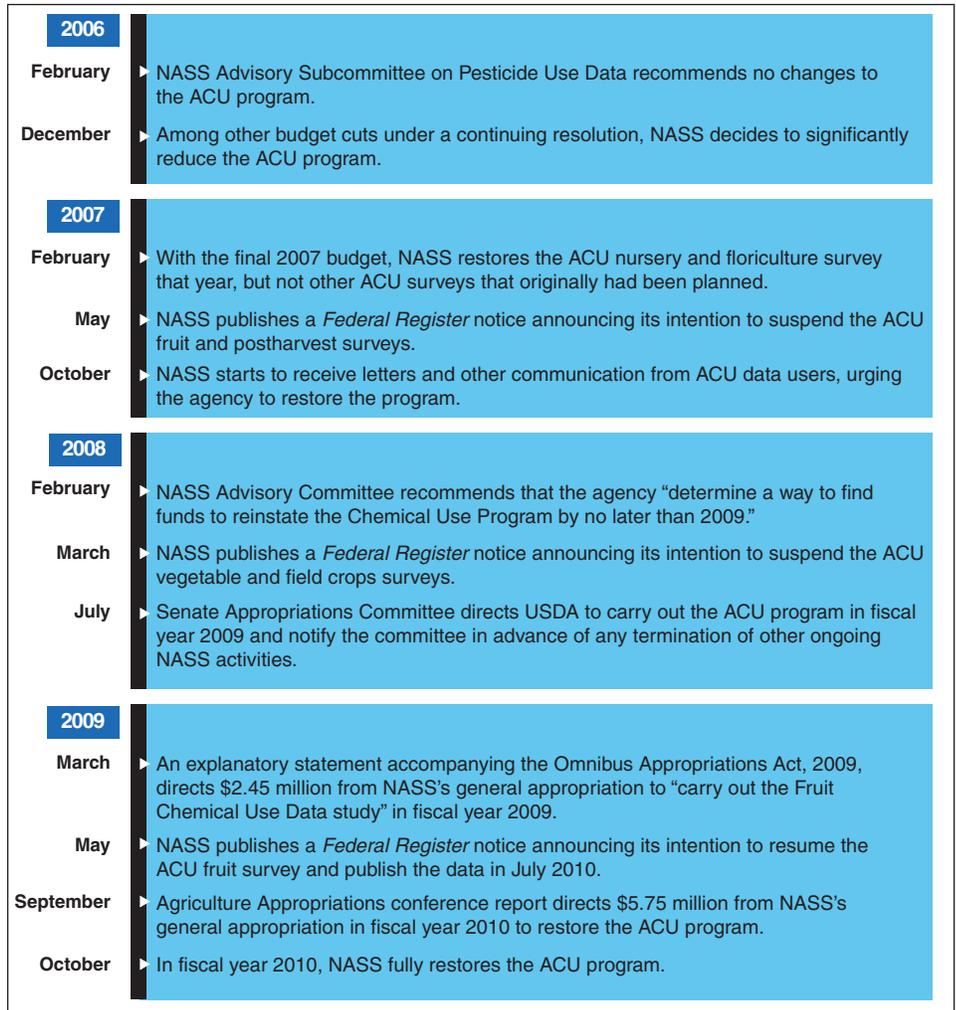
Most ACU data users we interviewed told us that they perceived three or more of NASS’s decision factors to be irrelevant or misapplied to the ACU program, and all 25 users disagreed with at least one factor. Specifically, many users said two factors—that ACU data are not designated principal economic indicator data, and that USDA does not need the data for its farm payment or safety net programs—may be meaningful to NASS or USDA, but they were not relevant to the users. For instance, NASS officials pointed out that these factors did not reflect the reasons the ACU program was created, which was to provide important information to EPA and the public. Furthermore, officials from NRCS and USDA’s Farm Service Agency (FSA) told us that they have historically used ACU data to

⁸GAO, *Continuing Resolutions: Uncertainty Limited Management Options and Increased Workload in Selected Agencies*, [GAO-09-879](#) (Washington, D.C.: Sept. 24, 2009).

inform environmental models which, in turn, these agencies rely on to make payments to farmers for conservation programs. For example, an FSA senior economist stated that the ACU data are used not only to help target areas where agricultural runoff may be impairing water quality but also to help assess the results of its Conservation Reserve Program by evaluating fertilizer usage trends. In addition, several users argued that, contrary to NASS's assessment, the lack of ACU data could negatively impact the commodities market. For example, in the absence of ACU data, EPA and the public might cautiously, but perhaps erroneously, assume a chemical of concern was used on a widespread basis—similar to the Alar-on-apples scare in the late 1980s that led to the ACU program's creation. Moreover, while there are other data sources available, all 25 users said that they rely on ACU data to meet their informational needs, largely because other sources are not publicly available on a national scale. (For the purposes of this report, the term “publicly available” refers to data that are free of charge, easily accessible to the public, and do not have proprietary restrictions on their use or dissemination.)

Finally, most users said they disagreed with the statement made by the 2006 NASS Advisory Subcommittee on Pesticide Use Data that support for the ACU program was “soft” or said that NASS had taken the statement out of context. For example, the subcommittee co-chair and two members we interviewed pointed out that while the subcommittee concluded there was not a groundswell of interest to increase NASS's budget to expand the ACU program, the subcommittee also recommended that “no changes to the current NASS program are advised at this time.” We also confirmed these statements through the subcommittee's report in February 2006 to the full NASS Advisory Committee on Agriculture Statistics. After NASS cut the program, the subcommittee co-chair spoke publicly to the full advisory committee in February 2008 to clarify the subcommittee statement that NASS had cited in its decision to cut the program. The co-chair asserted that NASS had misinterpreted the statement and that without ACU data, “there would be no more transparency for regulation and no chance for the agricultural community to review [EPA's risk] assessments for accuracy.” At that same meeting, the full advisory committee—consisting of members from commodity groups, agricultural companies and producers, a chemical manufacturer, academia, government, and other entities—then recommended that NASS restore the ACU program by no later than 2009. Figure 2 shows the time line of events related to NASS's decision to reduce and restore the ACU program.

Figure 2: Time Line of Key Events Related to NASS’s Decision to Reduce and Restore the ACU Program



Sources: GAO analysis of relevant documents.

Users Relied on Older ACU Data During Program Reduction and Said the Data Are High Quality but Could Be Enhanced

Most users told us they relied on older ACU data during the program's reduction and said that a longer data gap would have further hindered their ability to make decisions. All users said they regard ACU data to be of high quality and generally useful for their purposes, but nearly all users stated that the data could be even more useful with more frequent reporting, greater geographic detail, and additional data elements. However, NASS officials said that implementing users' suggestions could significantly increase costs. NASS has entered into cooperative agreements with some states, on a reimbursable basis, to provide additional ACU data that may have broader public benefits, but its ability to do so may not be widely known due to limited outreach by the agency. In addition, NASS's online ACU resources are difficult to locate and incomplete, which limits ACU data users' ability to access and use the data. NASS has several mechanisms to gather input from data users, such as general feedback comment forms on NASS's Web site, but most ACU users indicated these mechanisms are not effective in ensuring ACU data continue to meet their needs.

Users Relied on Older ACU Data During Program Reduction and Said a Longer Data Gap Would Further Hinder Decision Making

In the absence of new ACU data in recent years, most users said they had to rely on older data, which hindered their ability to make informed decisions because agricultural chemical use can change from year to year due to the emergence of new pests, weather variations, changing market conditions, and other factors. For instance, users reported the following:

- Michigan Department of Agriculture officials said that during the ACU program reduction, some pesticide products became obsolete while other, newly registered products had come into use that were not captured in the older data. They noted that, over time, older data become less valid for decision making purposes. These officials also said that while fertilizer products have not changed substantially in recent years like pesticide products have, fertilizer use rates and types have changed—such as decreases in phosphorous use, and liquid instead of dry formulations. If current data had been available, they could have factored fertilizer usage changes into the state's outreach and education efforts to commodity groups. For example, Michigan is currently working with local communities and the fertilizer industry to develop standards and regulations for phosphorous use on turf grass to eliminate concerns of surface water contamination.
- AAPCO officials said that, during the ACU program reduction, the Nebraska Department of Agriculture had recently looked at ACU data on corn and soybeans because of concerns about two particular herbicides—

atrazine and metolachlor—in waterways. Because the most recent ACU data covered the 2005 and 2006 production years, Nebraska officials were limited in their ability to make informed decisions and had to assume, rightly or wrongly, that farmers had not changed their herbicide use in more recent years. These decisions pertained to regulatory decisions on pesticide use restrictions, estimating where pesticides of highest risk are used, setting priorities for compliance monitoring, and allocating resources. In addition, the AAPCO officials noted that the ACU data gap would create a visible break in the charts and tables that state agencies disseminate to the public to illustrate long-term trends in pesticide use.

- The Fertilizer Institute—a national organization representing producers, importers, wholesalers, retailers, and others involved in the fertilizer industry—pointed out that the most recent ACU corn fertilizer data available are from the 2005 production year. While the institute’s analysis of these data shows that fertilizer use per bushel declined from 1990 to 2005, the institute cannot determine whether this trend has continued or changed in recent years, when corn production has surged due to increased demand for ethanol.
- An official from the Florida Department of Agriculture and Consumer Services—which is required by state law to compile usage information on restricted-use pesticides every 3 years—said his agency relies heavily on NASS for this information. Given the ACU data gap, this state agency will have substantially less information to report since resource constraints prevent the state from collecting its own pesticide usage data. In addition, since 2005, Florida—the nation’s second-largest fruit-producing state—has grappled with the rapid spread of a disease called citrus greening, which has caused farmers to be more aggressive in applying pesticides to protect their crops. The Florida official said that the older ACU data do not reflect these changes, thus limiting the state’s ability to evaluate the potential adverse impacts of pesticides on water resources.
- Researchers from the Center for Food Safety and The Organic Center—nonprofit organizations that advocate for safe food production and sustainable agriculture—said the ACU data gap hampered their efforts in recent years to quantify an increase in the use of herbicides, particularly glyphosate, triggered by the adoption of genetically modified crops. These researchers stated that the lack of new ACU data, particularly for corn, has made it difficult to track and project herbicide use at a time when weeds have become resistant to herbicides, and corn production has surged.

Nearly all users said a longer ACU data gap would further hinder their ability to make decisions. Examples are as follows:

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- EPA officials noted that before they knew the ACU program was being restored, they were discussing internally how to conduct risk assessments using only privately sourced pesticide use data. EPA officials stated that relying solely on private data sources would pose problems for the agency for three reasons: (1) EPA prefers to have multiple data sources as a quality check and has high confidence in NASS's statistical validity, (2) private data outputs cannot be disclosed to the public due to proprietary restrictions, and (3) ACU surveys include some crops that are not surveyed by private data sources. EPA prefers to make the data underlying its pesticide decisions as public as possible and, in doing so, EPA typically aggregates NASS's and private data outputs to comply with proprietary restrictions and avoid disclosing the private sources' specific data outputs. Furthermore, without sufficient chemical usage data, EPA officials said the agency might have to assume that 100 percent of crop acres were treated with a given pesticide. According to EPA, such an assumption would likely overstate usage, based on past ACU data showing that, in nearly all cases, less than 100 percent of crop acres were treated. In turn, this assumption could result in very conservative human health risk assessments showing risks above EPA's level of concern and lead to regulatory action, such as removing a pesticide product from the market, which would not occur if sufficient usage data were available.
 - A USGS official said that, in the long-term, a lack of current ACU fertilizer data would hinder federal, state, and local government efforts to control excess nutrients in large water bodies such as the Chesapeake Bay, Great Lakes, and Gulf of Mexico, as well as streams and aquifers. For example, the hypoxic zone in the northern Gulf of Mexico refers to an area along the Louisiana-Texas coast in which water near the bottom of the Gulf contains minimal oxygen (less than 2 parts per million of dissolved oxygen), causing a condition referred to as hypoxia. Hypoxia can cause fish to leave the area and can cause stress or death to bottom-dwelling organisms that cannot move out of the hypoxic zone. Hypoxia is believed to be caused primarily by excess nutrients delivered from the Mississippi River in combination with seasonal stratification of Gulf waters. The USGS official added that the cost of the ACU program is proportionately small compared with the environmental challenges faced by regulators to control runoff from agricultural pesticides and fertilizers, particularly nitrogen, in water.
 - A NASDA official said that state agencies can temporarily rely on older data for planning purposes—such as targeting food safety samples to look for illegal chemical residues—but, in the long-term, the data would start to lose credibility.

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- An academic researcher at the University of Idaho noted that his recent analysis of herbicide use on soybeans—which supported the finding that U.S. farmers minimized their production costs to remain competitive—would not have been possible without ACU data. He stressed that a long-term data gap may lead to incorrect conclusions because older data may not reflect current practices.
 - The Director of the North Central Integrated Pest Management Center located at the University of Illinois commented that, without ACU data, it is difficult to evaluate whether targeted pest management practices—such as scouting to detect pests, weather monitoring, and analysis of soil and plant tissue—are reducing or altering pesticide use.

Users Said ACU Data Are High Quality but Could Be Enhanced with Additional Information and Detail, Which NASS Said Would Be Costly

According to NASS's strategic plan, the agency's mission is to provide accurate, timely, and useful statistics in service of U.S. agriculture.⁹ As part of this mission, NASS strives to meet the agricultural data needs of those working in agriculture and others by objectively providing important, usable, and accurate statistical information needed to make informed decisions. All 25 users we interviewed said they consider ACU data to be of high quality—accurate, relevant, and reliable—and generally useful for their regulatory, business, research, and other purposes. For example, several users complimented NASS for its rigor in collecting and analyzing what they regard to be a statistically valid sample of farmers, and some users complimented the agency for protecting the identity of individual respondents. While some users pointed out that data accuracy can only be as good as what farmer respondents tell NASS enumerators, none of the users raised any concerns about NASS's data collection, analysis, or storage. While we did not perform electronic testing of ACU data elements or trace a sample of data to source documents, we did review NASS's controls for the information system that stores the data. We found that NASS takes several measures to ensure the data's quality. For example, agency officials said that the enumerators are trained to catch and correct errors in farmers' responses, and NASS field offices and headquarters provide additional checks before and after the data are entered into NASS's information system. Many users also expressed satisfaction with NASS's transparency in disclosing the methodology used for ACU data collection, such as the number of respondents, acres, and states covered in the various ACU data reports. Several users said the

⁹U.S. Department of Agriculture, National Agricultural Statistics Service, *Strategic Plan for 2006-2011* (Washington, D.C.: April 2007).

timing of the data release—generally in spring or summer, after the surveys are conducted in the fall—is reasonable and meets their needs, although some users, such as EPA and chemical manufacturers, would prefer receiving the data sooner.

Nonetheless, nearly all users said the data would be even more useful if they were disseminated more frequently, in greater geographic detail, or with additional data elements.¹⁰ First, most users said more frequent ACU surveys of fruits, vegetables, and other minor crops, as well as the major field crops—corn, soybeans, cotton, and wheat—would allow users to more accurately track trends. For example, the Natural Resources Defense Council, a nonprofit environmental organization, has used ACU data to research what alternatives to methyl bromide exist for various fruits and vegetables.¹¹ However, because crop conditions, including weather, change every year and impact chemical use, this organization said that annual data would better establish trends. Chemical manufacturer members we interviewed from the American Phytopathological Society—an organization of plant disease researchers—also noted that, because NASS does not survey every crop every year, users have to estimate the values for the years between data points, which may or may not be accurate, especially if there are unexpected pest outbreaks. Similarly, the American Nursery & Landscape Association and the Society of American Florists said that more frequent surveys of their crops—which are currently surveyed every 3 years—would provide a more accurate depiction of chemical use. According to The Fertilizer Institute, about 70 percent of fertilizer use pertains to corn, soybeans, cotton, and wheat, with corn alone accounting for about 50 percent of all fertilizer applied in the United States, by volume. Furthermore, corn, soybeans, and wheat comprise a significant portion of acres planted in the United States. Given the economic importance of these crops and the need to calculate nutrient use per unit produced, the institute believes that having annual data on these crops, particularly corn, is warranted. The National Corn Growers

¹⁰Although these were the most frequent suggestions made by users we interviewed, other suggestions to enhance the data's usefulness included adding more crops to ACU surveys, such as kale, garlic, and canola; adding data elements on acres planted with genetically modified versus conventional crops; and adding data elements on whether farmers use conventional or organic practices.

¹¹Methyl bromide is a fumigant used to control pests across a wide range of agricultural sectors. According to EPA, the amount of methyl bromide produced and imported in the United States was reduced incrementally until it was phased out in 2005 because it was found to deplete the stratospheric ozone layer.

Association added that changes due to weather conditions and other factors can lead to an “outlier” year in pesticide and fertilizer use. Since ACU corn data are collected every other year, officials from this organization said that one outlier year can significantly skew trend analyses, whereas annual data would provide a more accurate picture.

Second, many users stated that a greater level of geographic detail—such as at an intrastate regional, county, zip code, or watershed level—would greatly enhance users’ ability to focus on areas where chemical usage is changing and therefore assess potential environmental impacts. For example, officials from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service said they would use ACU data more if the data included more geographic details, which would assist the agencies in narrowing the relevant geographic range for Endangered Species Act (ESA) consultations and actions. Currently, they said that because the data are aggregated at the state level, federal agencies cannot necessarily determine whether a chemical of concern is being used in areas where a threatened or endangered species has habitat. Similarly, AAPCO officials said that more geographic specificity would allow state pest control officials to target education and response efforts to help prevent or remediate pests and to monitor water quality impairments, such as atrazine contamination in small watersheds, where the source of contamination is unknown. For instance, an official from the Florida Department of Agriculture and Consumer Services—which relies on ACU data to refine risk assessments for pesticides based on how and where they are currently being used—pointed out that pest management practices for a crop grown in the southern part of the state may differ from practices used for the same crop grown in the northern part of state. The official said that if ACU data provided intrastate regional or county-level detail, it would help the agency better assess potential exposure scenarios for nontarget organisms, such as endangered species.

Third, many users said that additional data elements, particularly the timing and method of application, would further enhance their ability to gauge trends and impacts. For instance, Washington State Department of Agriculture officials said the timing of application is important for ESA assessments because a species may be more adversely affected by a pesticide at certain times of its life, such as when salmon are hatching and spawning, and knowing the application method is useful because aerial application has a greater risk of impacting waterways than does ground application. Similarly, AAPCO officials said that, for monitoring purposes, the timing of an application matters because pesticides can have greater environmental impacts under certain conditions, such as heavy runoff

during rainfall or irrigation. EPA officials noted that one private data source provides many more data elements than NASS—including the pests that a chemical targets and the method of application—which EPA finds useful for its regulatory purposes. For example, if EPA determines that there are risks above the agency’s level of concern for a particular application method of a given pesticide, it is important to know what application methods are commonly used to assess the impacts of restricting the method of concern. Regarding fertilizers, The Fertilizer Institute has suggested to NASS, among other things, that the agency should collect and report data on the timing and placement of fertilizers, as well as the use of specific fertilizers designed to enhance efficient use of nutrients for crops such as corn, wheat, and cotton. According to the institute, these additional data elements would enable ACU data users to evaluate farmers’ adoption of best management practices that promote conservation and would assist in environmental modeling of greenhouse gas emissions. In addition, the institute said that ACU data on manure and biosolids would provide a more comprehensive picture of nutrient use.

OMB guidance directs federal agencies, among other things, to establish and maintain communication with data users to ensure data meet their informational needs. OMB also directs agencies to (1) periodically review information systems to determine how mission requirements might have changed and whether the information continues to fulfill ongoing and anticipated mission requirements and (2) ensure the information delivers intended benefits to the agency and customers. In addition, OMB asserts that one of the basic assumptions of federal information resources is that the expected public and private benefits derived from government information should exceed its public and private costs, recognizing that the benefits may not always be quantifiable.¹² In this regard, we note that it is important for investments in federal programs, including program enhancements, to produce more than marginal increased benefits when significant costs are involved, due to limited federal resources.

NASS officials said that implementing users’ suggestions could significantly increase costs. In particular, they noted that disseminating the data at a more detailed geographic level would require NASS to collect and analyze data from additional respondents to make the data statistically reliable at that level. In addition to the associated cost, NASS officials stated that there may not be enough farmers within a smaller geographic

¹²OMB Cir. No. A-130.

area to produce reliable estimates and to protect respondent confidentiality. NASS officials also said that, while fruits and vegetables have been surveyed every other year since the beginning of the ACU program, NASS changed the frequency of the field crops surveyed several times from 1998 to 2004 due to budget limitations and escalating survey costs. Officials said the agency consulted commodity groups and other users about these crop survey frequencies in face-to-face meetings over the years. More recently, NASS started reporting a new data element on chemical rate distribution in 2005, in response to a request from EPA's Office of Pesticide Programs, so that EPA could better understand the typical range of chemical usage in addition to the average usage rates that NASS has historically provided. However, NASS officials said they have not engaged users in any formal, large-scale process to consider the effects of potential program changes on users, or to weigh the costs and benefits of implementing users' suggestions.

NASS Has Entered into Agreements with Some States to Provide Additional ACU Data, but Its Ability to Do So May Not Be Widely Known

As part of NASS's mission to provide accurate, timely, and useful agricultural statistics, NASS performs reimbursable survey work for other federal agencies, states, and private organizations to meet their informational needs. Toward that end, NASS has entered into cooperative agreements with some state agencies over the years to address a variety of state informational needs regarding pesticide or fertilizer usage and management practices. Under these agreements, the states reimbursed NASS for the extra costs incurred to collect, analyze, and provide additional data or geographic details than are contained in the standard ACU data disseminated to the public—or, if the state would have otherwise not been surveyed, to collect, analyze, and disseminate the standard ACU data. Although these agreements result in additional ACU data to meet individual states' needs, these agreements may also have broader public benefits. For instance, the additional ACU data generated from North Dakota's fiscal year 2009 cooperative agreement with NASS was used in a paper on pesticide use and pest management practices in that state, which is available to the public on North Dakota State University's Web site.

From fiscal year 2006 through 2010, these agreements have totaled more than \$405,000 in constant 2010 dollars.¹³ Examples are as follows:

¹³Unless otherwise noted, all cooperative agreement amounts are in constant 2010 dollars.

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- The Washington State Department of Agriculture entered into agreements totaling nearly \$53,000 for NASS to collect and analyze data on the timing of pesticide applications for fruits and vegetables in fiscal years 2006 and 2007. Once the ACU program was restored in 2010, Washington again entered into an agreement with NASS to collect and analyze additional fruit pesticide usage data elements, this time for nearly \$36,000. NASS also provided these data to Washington at the agricultural statistics district level, which is a grouping of counties within a state based on geography, climate, and cropping practices.
 - The Minnesota Department of Agriculture—which is required under state law to monitor rural and urban pesticide use—entered into cooperative agreements with NASS from 2006 through 2010 totaling more than \$235,000 to provide detailed herbicide management practices for corn in certain years and detailed pesticide usage data for corn, soybeans, wheat, and hay in other years. Minnesota entered into these agreements with NASS regardless of whether those crops were being surveyed as part of NASS’s standard ACU data collection. A Minnesota official told us that, among other benefits, these cooperative agreements result in ACU data being collected from a significantly larger number of farmers and are reported in greater geographic detail, which helps inform the state’s environmental programs and education and outreach efforts.
 - The Wisconsin Department of Agriculture also entered into a cooperative agreement with NASS in 2006 for nearly \$24,000 to be included in the ACU field crops survey because the state would not have otherwise been surveyed due to insufficient acreage of the crops surveyed that year.

Table 1 shows the cooperative agreements that NASS entered into with four states to provide additional ACU data for fiscal years 2006 through 2010, as identified by the agency.

Table 1: NASS Cooperative Agreements with States to Provide Additional ACU Data, Fiscal Years 2006 through 2010

Fiscal year	State	Brief description	Amount ^a
2006	Minnesota	Phone survey for pesticide usage data from 7,600 corn, soybean, wheat, and hay farmers	\$43,011
	Washington	Pesticide usage practices data for fruit crops	26,882
	Wisconsin	Pesticide usage data for field crops	23,941
2007	Minnesota	Phone survey for herbicide management practices data from 7,000 corn farmers	33,056
	Washington	Pesticide usage practices data for vegetable crops	26,095
2008	Minnesota	Phone survey for pesticide usage data from 7,700 corn, soybean, wheat, and hay farmers	49,317
2009	Minnesota	Phone survey for herbicide management practices data from 7,000 corn farmers	31,891
	North Dakota ^b	Phone survey for pesticide usage and pest management practices data from 7,000 farmers of multiple crops	57,399
2010	Minnesota	Phone survey for pesticide usage data from 7,600 corn, soybean, wheat, and hay farmers	48,350
	Minnesota	Phone survey for fertilizer usage and management practices data from 7,000 corn farmers	30,000
	Washington	Pesticide usage practices data for fruit crops	35,825
Total			\$405,767

Source: GAO analysis of NASS-state cooperative agreements.

^aAll amounts are in constant 2010 dollars.

^bThis agreement was with North Dakota State University but was funded by the state's department of agriculture.

NASS can enter into these agreements through its general authority to use cooperative agreements with state departments of agriculture, federal agencies, colleges, universities, other research organizations, and other parties. According to its strategic plan, NASS has partnerships with state departments of agriculture and land-grant universities through its 46 field offices to serve the agricultural data needs at both state and federal levels, eliminate duplication of effort, provide for state input, maintain national consistency, and minimize overall costs to federal and state governments. In addition, these partnerships are designed to maximize the benefits of NASS's service while minimizing the burden on survey respondents. For example, Washington State Department of Agriculture officials told us they had considered starting up a statistically robust, statewide pesticide use data collection but determined they would face many challenges—including regulatory, disclosure, and technical problems—and would not likely get the response rate that NASS does. In addition, these state officials estimated it would cost them about \$2 million to collect pesticide

use data for the 300 minor crops grown in Washington alone—an amount that exceeded their budget. Furthermore, Washington state officials told us that legislative proposals to require the state to collect its own pesticide usage data on this scale have been defeated because of the overlap with NASS's data.

However, we found that NASS's ability to enter into reimbursable cooperative agreements may not be widely known by state agency officials due to limited outreach by NASS. For instance, AAPCO, Florida, and Iowa pesticide control officials told us they were not aware of these agreements and that, if they were better publicized, more states might enter into such agreements to make ACU data even more useful for their purposes. AAPCO, Florida, and NASDA officials added that, while most state agencies may not be able to afford collecting their own pesticide use data on a large scale, they might be able to provide the necessary funding to reimburse NASS for the marginal costs associated with the additional ACU data collection and analysis. While NASS officials said their field offices make the agency's ability to enter into reimbursable cooperative agreements known to heads of state departments of agriculture—not just for the ACU program but for a variety of data programs—they acknowledged that this ability may not be widely known within various departments of state government, and that the agency could improve its outreach.

NASS's Online ACU Resources Are Difficult to Locate and Incomplete, Which Limits Users' Ability to Access and Use the Data

OMB guidance directs federal agencies to make electronic information easily accessible and useful to the public.¹⁴ In addition, we have previously reported on the importance of federal programs allowing users to easily access and use information on Web sites by providing workable navigation features and links and by refining Web-based tools, among other things.¹⁵ However, we found, and several ACU data users stated, that ACU reports, data tools, and related resources are difficult to locate on NASS's Web site and that the online data tools are not complete or user-friendly, limiting users' ability to access and use the data. Specific examples are as follows:

- While there are a number of links from NASS's home page that eventually lead to ACU data, some of those links lead only to the most recently

¹⁴OMB Cir. No. A-130.

¹⁵GAO, *Medicare: Communications to Beneficiaries on the Prescription Drug Benefit Could be Improved*, GAO-06-654 (Washington, D.C.: May 3, 2006).

released data—but not the breadth of ACU data reports over the life of the program. NASS’s home page also provides a search function for its site, which allows users to locate specific ACU data reports by searching terms such as “chemical use,” “pesticides,” or “fertilizers.” However, this search function does not lead directly to NASS’s dedicated Web page for the ACU data, which is labeled “Environmental,”¹⁶ where all historical ACU summary reports and two data tools are located. We found, and some data users we interviewed commented, that “Environmental” is not necessarily an intuitive subject heading for the ACU program and, therefore, the ACU data could be overlooked by other potential users.

- Related ACU resources such as user guides—which provide an overview of the content, methods, and frequency of the various ACU reports—and the survey instruments used by the enumerators are not easily found on NASS’s Web site, including on the “Environmental” page. Furthermore, the schedule for upcoming ACU data releases is not contained on, or linked from, the “Environmental” page.
- Two data tools are available on NASS’s Web site, but these online tools do not include all years or commodities covered by the ACU program. These tools, called Quick Stats and the Agricultural Chemical Use Database (ACU Database),¹⁷ allow users to search and download ACU data across multiple years and sort and analyze the data to fulfill their individual needs. Specifically, Quick Stats gives users the ability to query by commodity, state, and year, and to download the results into a database or spreadsheet, while the ACU Database offers interactive access to ACU statistics by commodity, state, year, and active ingredient and provides search results in downloadable spreadsheets, U.S. maps, and graphs. However, as of October 2010, Quick Stats was missing historic ACU vegetable, postharvest, nursery and floriculture, and livestock data. Meanwhile, the ACU Database had not been updated in nearly 3 years, and therefore it was missing the nursery and floriculture data released in 2007 and the apples, organic apples, and cotton data released in 2008, as well as the wheat and fruit data released in 2010. Incomplete data tools may prevent users from accessing all available information relevant to their purposes. NASS officials said they plan to update a newer version of Quick

¹⁶As of October 2010, NASS’s “Environmental” page was located at http://www.nass.usda.gov/Statistics_by_Subject/Environmental/index.asp.

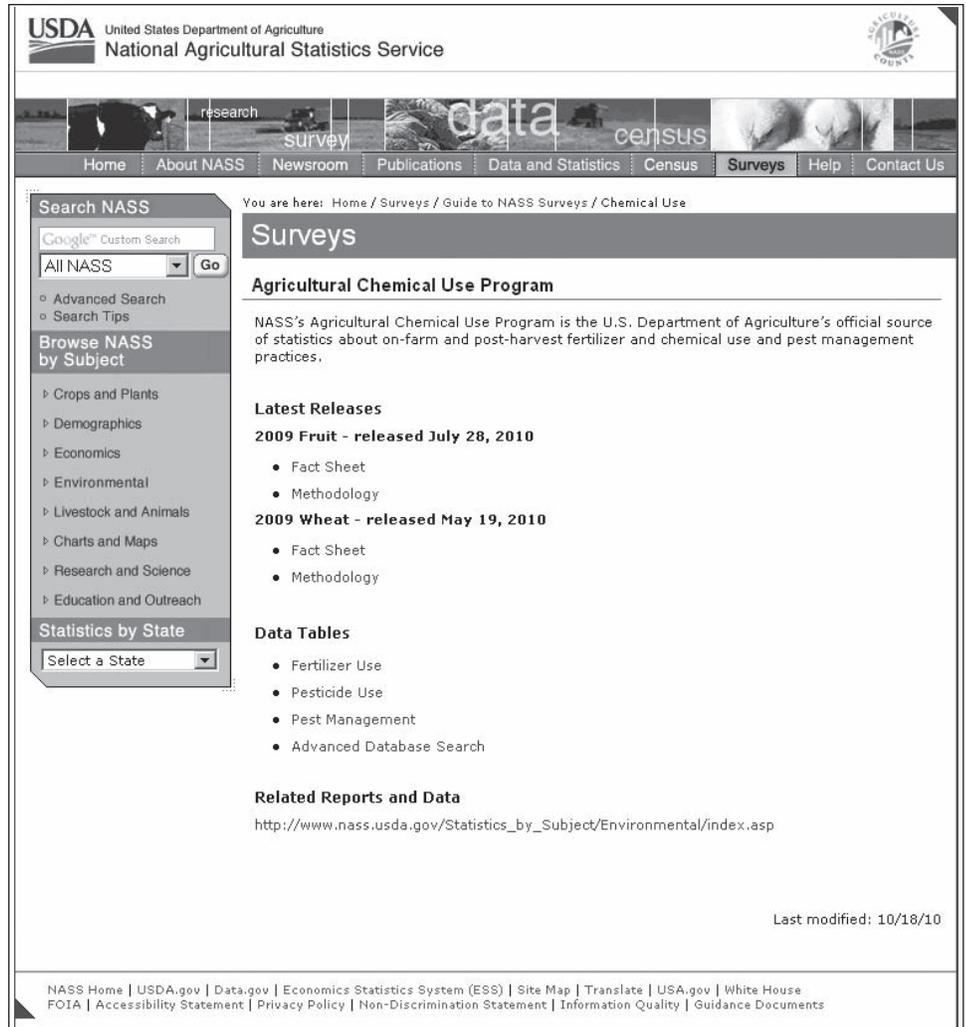
¹⁷As of October 2010, the original version of Quick Stats, Quick Stats 1.0, could be found at http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats_1.0/index.asp, and a new version, Quick Stats 2.0, was located at <http://quickstats.nass.usda.gov>. Meanwhile, the ACU Database could be found at <http://www.pestmanagement.info/nass>.

Stats with historic ACU data as resources allow, but they did not have specific time frames for doing so. In addition, NASS officials said that the agency's priority is to populate the Quick Stats tool before it turns its attention to updating the ACU Database because Quick Stats is used for all NASS data programs.

During our review, as part of a broader effort to redesign its Web site and improve its delivery of electronic information, NASS created a new Web page for its May 2010 release of the 2009 ACU wheat crops data. This Web page is titled "Agricultural Chemical Use Program," which is intended to improve users' ability to access and use the data.¹⁸ In an effort to reduce costs, NASS also discontinued the annual ACU summary reports and instead released the 2009 ACU wheat and fruit data only in its Quick Stats online data tool. At the same time, NASS released fact sheets and documents describing the methodology used for each of those ACU data releases. NASS officials said the new ACU Web page will be expanded to contain similar information for future releases of ACU field crop, fruit, vegetable, nursery and floriculture, postharvest, and livestock data. However, NASS officials acknowledged they did not consult ACU data users before redesigning the Web site, discontinuing the summary reports, or releasing the data only in the Quick Stats data tool, to determine if these changes would serve users' needs. For example, the Minor Crop Farmer Alliance—a national organization representing farmers, processors, and others involved in the production of various food, fiber, nursery, and horticultural products—said their members were "surprised and disappointed" about the discontinuation of the ACU summary reports, which had provided a useful overview of chemical use. This organization stated that while the Quick Stats data tool allows users to find information on specific pesticides, the lack of an easily accessible ACU summary will reduce individual farmers' ability to compare their chemical use with other farmers and could lead to lower farmer participation in future ACU surveys. Figure 3 shows how NASS's new "Agricultural Chemical Use Program" Web page appeared as of October 2010.

¹⁸As of October 2010, the "Agricultural Chemical Use Program" Web page was located at http://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Chemical_Use.

Figure 3: NASS's New "Agricultural Chemical Use Program" Web Page, as of October 2010



Source: NASS's Web site.

NASS Has Several Mechanisms to Obtain Data Users' Input, but ACU Users Say These Mechanisms Are Not Effective

NASS has several mechanisms to gather input from its data users in general: (1) semiannual USDA data user meetings held in Chicago and Denver; (2) general feedback comment forms on NASS's Web site; (3) the NASS advisory committee; (4) NASS field offices, which interact frequently with state departments of agriculture; and (5) NASS headquarters officials, who communicate with users on an ad hoc basis at users' request. These mechanisms are available to users of any of NASS's

more than 500 data reports from across the spectrum of the agency's programs. In addition, NASS distributes annual evaluation forms to the field offices to gather suggestions on the procedures and survey instruments used for the agency's various data collection efforts.

However, most ACU data users we interviewed said they did not know about these mechanisms or that these mechanisms are not specifically focused on the ACU program and, therefore, are not effective in ensuring that ACU data continue to meet users' needs. NASS officials acknowledged that the agency currently lacks a formal, targeted mechanism to obtain input from ACU data users on a regular basis. For example, the semiannual USDA data user meetings in Chicago and Denver focus on one particular data program at each of these meetings, and NASS officials said they could not recall a time when ACU had been the focus.¹⁹ In addition, an official from the CropLife Foundation—a nonprofit research organization supported by pesticide manufacturers and others—commented that while federal advisory committees can be effective in gathering input and making recommendations to an agency for improvement, their role is generally to report back to the agency on high-priority issues, rather than collect feedback on an ongoing basis.

While several ACU data users have met with NASS officials on an ad hoc basis over the years, nearly all users said that a more regular, focused mechanism would allow them to better provide NASS with feedback on ways to enhance the ACU data's usefulness. These users said that such a mechanism—such as Web-based meetings or teleconferences with users interested in a specific ACU survey—would allow NASS to receive sufficient and timely information to ensure the ACU data continue to meet users' needs. Furthermore, the NASS Advisory Subcommittee on Pesticide Use Data recommended in 2006 that NASS should improve its relationship with ACU data users by soliciting regular feedback and hosting more frequent user group meetings—a recommendation that NASS officials said the agency has accepted and is considering how to implement. Representatives from other agricultural chemical usage data sources told us they employ several mechanisms to obtain feedback from their users on a regular or ad hoc basis or both, including through user group meetings,

¹⁹The USDA data user meetings cover data generated not only by NASS but also by USDA's World Agricultural Outlook Board, Economic Research Service, Agricultural Marketing Service, and Foreign Agricultural Service, as well as data generated by the U.S. Census Bureau.

Web-based comment boxes and pop-up surveys, conferences, agency committees, and meetings with individual data users.

As we stated earlier, OMB guidance directs federal agencies to establish and maintain communication with users to ensure data meet their needs and that the expected benefits exceed costs.²⁰ In addition, NASS's strategic plan states that data user meetings are a primary source of customer input that keeps its agricultural statistics programs on track with the needs of the user community. However, during our review, NASS officials stated that, due to the publicly available nature of their data, the agency is not aware of who all its data users are—which limits their ability to know and understand all of the purposes for which ACU data are used by various entities. While NASS is able to identify some of its users through e-mail subscriptions, relationships with federal agencies, and cooperative agreements, it is a challenge for the agency to identify a wider array of users without creating barriers to users' access to data, such as by requiring log-in registration, or incurring additional cost. Officials said the challenge in identifying users applies not only to the ACU data program, but to the agency's data programs in general. Nonetheless, NASS officials said that, as of September 2010, they were evaluating ways to improve communication with users. An internal Program Planning Council recommended in spring 2010 that NASS continue exploring opportunities to more strategically engage, and solicit input from, stakeholder organizations and other data users representing various sectors of agriculture in different regions of the country. Specifically, NASS officials said they are considering holding expanded data user meetings in conjunction with trade shows or other events where producers and data users from several agricultural sectors would be in attendance.²¹ In addition, agency officials are exploring advances in technology, such as Web-based conferences, to allow greater attendance. However, NASS officials did not provide specific time frames for implementing these efforts, and they said that an ACU-specific data user meeting was not scheduled as of September 2010.

²⁰OMB Cir. No. A-130.

²¹According to NASS officials, the Program Planning Council is an ongoing team comprising NASS's 10 senior executives, 2 rotating branch chiefs, and 4 rotating field office directors, and usually meets once each spring and fall.

Other Sources Provide Agricultural Chemical Usage Data, and NASS May Not Be Fully Leveraging Resources or Minimizing Overlap with These Sources

Agricultural pesticide and fertilizer usage data are available through several state, private, and other sources. These data vary in their cost, geographic and crop coverage, level of detail, and other attributes. However, NASS may not be fully leveraging resources or minimizing potential overlap with its ACU data collection due to its limited knowledge of other publicly available data sources.

Other Data Sources Vary in Their Cost, Geographic and Crop Coverage, Detail, and Other Attributes

During our review, we identified and collected information from several state, private, and other sources of agricultural chemical usage data that cover the application or sales of pesticides, fertilizers, or both.²² Specifically, seven states collect and disseminate publicly available data covering their own states. For example, Arizona collects and disseminates data on pesticide application, while Iowa collects and disseminates data on pesticide sales. Data from these state sources also vary in their crop coverage. For instance, New Jersey covers 32 crops, while California covers more than 200 crops. All seven states aggregate the data at the state level, five states also aggregate data at the county level, and five states provide other levels of geographic detail such as watershed, zip code, and field. Four of these states collect data via mandatory reports from pesticide manufacturers, dealers, or users. Other data collection methods include questionnaires, site inspections, and document review. Six of these state sources disseminate these data to users via their Web sites. Other data dissemination methods used by the states include mail, e-mail, and presentations. In addition, these sources variously include data elements such as the names of active ingredients applied or sold and the total amount of chemical applied or sold.

We also identified three private sources of agricultural pesticide usage data in the United States: Crop Data Management Systems (CDMS), GfK Kynetec (formerly Doane Market Research), and Mike Buckley and

²²We developed and distributed a questionnaire to collect information from these data sources, the results of which are used to describe their data. Unless otherwise stated, we did not independently verify the questionnaire results.

Associates. These private sources all charge fees for their data and place proprietary restrictions on their use, such as requirements that the data not be shared with outside entities or released to the public. Additionally, all of these private data sources collect and disseminate data on both pesticide application and sales, while CDMS's data also cover fertilizer application and sales. Two sources cover multiple U.S. states, while one covers all U.S. states. These private data sources also vary in their crop coverage. For example, Mike Buckley's data cover 32 crops, while CDMS's data cover over 100 crop categories. All three private sources disseminate data at the state level, while two of them also disseminate data at a finer level of geographic detail, such as by county or agricultural statistics district, which is a group of counties. Data collection methods for these private sources include document review, site inspection, and questionnaires. The data are disseminated by various methods, including mail, e-mail, presentations, and on the Web. These private data sources all contain information on the names of active ingredients applied and sold, pesticide product name, application method, number of acres treated, and amount sold. These private sources may also include other data elements such as seed treatments, crop stage of application, and target pests.

We also found that the Association of American Plant Food Control Officials (AAPFCO) collects and disseminates fertilizer sales data. AAPFCO is a nonprofit organization whose members include state fertilizer control officials. These officials collect information on fertilizer sales within their state and report it to AAPFCO, which, in turn, disseminates these data annually for free to members and for a nominal fee to nonmembers. AAPFCO's data cover all U.S. states and are disseminated at the state and county levels. Data are not disseminated by crop. Data elements vary by state, depending on the state's reporting methods and requirements, but they generally include fertilizer product name and amount of fertilizer sold.

In addition, EPA publishes *Pesticides Industry Sales and Usage* reports, which are publicly available and combine NASS and other public and private data sources. Although these reports have not been issued since 2004 due to resource and time constraints, EPA officials said that the agency plans to publish one in 2010. This report will use data from NASS and GfK Kynetec for U.S. agricultural pesticide usage, as well as other public and private sources for pesticide use outside of the United States and general pesticide industry statistics. This publication includes information on all 50 states and disseminates data at the world and U.S. national levels. EPA does not disseminate these data by crop. Data

elements include names of the top active ingredients, total amount applied, and total amount sold.

Table 2 shows selected attributes of state, private, and other agricultural chemical usage data sources. See appendix II for a more detailed description of these data sources.

Table 2: Selected Attributes of Other Agricultural Pesticide and Fertilizer Usage Data Sources

Data source	Application or sales	Pesticides or fertilizers	U.S. geographic coverage	Level of geographic detail	Crop and livestock coverage and detail	Cost	Restrictions on data use
Arizona Pest Management Center historical pesticide use database	Application	Pesticides	Arizona	State, county	Over 150 crops, not disseminated by livestock species	Free	No
<i>California Pesticide Use</i> reports	Application	Pesticides	California	State, county, watershed, farm, field, and section (square mile)	Over 200 crops, 12 livestock species	Free	No
<i>Annual Pounds of Pesticides Sold in California</i> reports	Sales	Pesticides	California	State, county, watershed, farm, and field	Over 200 crops, 12 livestock species	Free	No
Iowa's Pesticide Database	Sales	Pesticides	Iowa	State, county, and watershed	Not disseminated by crop or livestock species ^a	Free	No
Minnesota Farm Nutrient Management Assessment Program	Application	Pesticides and fertilizers	Select watersheds or regions within Minnesota	Watershed and region	Has covered at least 8 crops, not disseminated by livestock species	Free	No
Minnesota Pesticide Sales Information	Sales	Pesticides	Minnesota	State	Not disseminated by crop or livestock species ^b	Free	No
New Jersey Pesticide Control Program	Application	Pesticides	New Jersey	State, county, watershed, and township	32 crops, not disseminated by livestock species	Free	No
New York Pesticide Reporting Program	Application and sales	Pesticides	New York	State, county, and zip code	Not disseminated by crop or livestock species	Free	No
Washington Pesticide Use Project	Application and sales	Pesticides and fertilizers	Washington	State	Not disseminated by crop or livestock species	Free	No

Data source	Application or sales	Pesticides or fertilizers	U.S. geographic coverage	Level of geographic detail	Crop and livestock coverage and detail	Cost	Restrictions on data use
CDMS	Application and sales	Pesticides and fertilizers	Multiple U.S. states	State, county, watershed, farm, field, and custom	Over 100 crop categories, not disseminated by livestock species	Priced	Yes
GfK Kynetec Syndicated U.S. Studies	Application and sales	Pesticides	Multiple U.S. states	State, agricultural statistics district, county, and U.S. national	61 crops, 7 livestock species ^e	Priced	Yes
Mike Buckley and Associates	Application and sales	Pesticides	All U.S. states	State	32 crops, not disseminated by livestock species	Priced	Yes
AAPFCO	Sales	Fertilizers	All U.S. states	State and county	Not disseminated by crop or livestock species	Priced	No
EPA <i>Pesticides Industry Sales and Usage</i> reports	Application and sales	Pesticides	All U.S. states	World and U.S. national	Not disseminated by crop or livestock species	Free	No

Sources: GAO analysis of information from these data sources.

^aIowa's data have been disseminated by crop when researchers matched them with NASS's ACU data to determine which pesticides are used on which crops.

^bMinnesota's sales data have been reported by crop when a pesticide is used only on one crop.

^cGfK Kynetec also reformats and sells California's data, covering 216 crops.

Many ACU data users that we interviewed said they also use state, private, or other sources of agricultural chemical usage data, but nearly all users emphasized that other sources do not replace NASS's data.²³ Nearly all ACU data users said, and we found, that NASS is the only source of publicly available data reflecting the actual application of agricultural pesticides and fertilizers on a wide array of crops on a national scale. EPA and USGS purchase private data, and all three organizations representing chemical manufacturers that we interviewed said that chemical manufacturers purchase private data. For example, as discussed, EPA relies on pesticide usage data from both NASS and private sources to evaluate the safety of pesticides. EPA officials stated that one private

²³We did not assess the reliability of other data sources and therefore cannot determine whether they, or any of their attributes, are comparable to NASS's ACU data or to each other.

source that they use provides somewhat different crop coverage and geographic detail, generally more data elements, and releases data a few months prior to NASS. EPA officials attested that this private data source meets EPA's methodological and transparency standards under its information quality guidelines and that EPA's use of these data is consistent with the Information Quality Act.²⁴ However, as discussed, EPA officials said the agency still needs ACU data from NASS as well, in part because proprietary restrictions on the use of the private sector data conflict with the agency's desire to publish data used in risk assessments to increase transparency.

Although some ACU data users reported finding private data useful, these data are not accessible to others due to cost. Officials from seven state agencies or their national representative organizations, representatives from two commodity groups and three public interest organizations, and two academics that we interviewed said that private data are cost-prohibitive. For example, private data can cost more than \$500,000 per year, an amount that some ACU data users indicated would exceed their entire annual budget. Furthermore, officials from the American Nursery and Landscape Association and the Society of American Florists indicated that private sources of agricultural chemical usage data are not useful for them because these sources do not produce data on nursery and floriculture crops. Several ACU data users also said they prefer not to use, or rely exclusively on, private data because proprietary restrictions would limit their ability to use or publish the data. In addition, many ACU data users noted that they use state data in addition to NASS's data, but several users said they could not rely exclusively on state data as they need a nationwide picture of agricultural chemical use, or one state's data do not necessarily apply to another state. For example, the Center for Food Safety uses California's publicly accessible data, but since this organization looks at national pesticide usage trends, it must use ACU data as well. Many users said that state data sources do not replace NASS's data because they cannot be extrapolated to the nation as a whole, as pest pressures, weather patterns, and crops differ geographically, and therefore pesticide use can vary significantly from one state to another.

²⁴The Information Quality Act requires OMB to issue guidelines for ensuring the quality, objectivity, utility, and integrity of information disseminated by federal agencies. OMB's guidelines direct agencies covered by the act to issue their own quality guidelines.

Furthermore, several users said they use state, private, or other sources in conjunction with NASS's data so that they can compare or verify data sources. For example, chemical manufacturer members of the American Phytopathological Society whom we interviewed, as well as EPA and USGS—said that they rely on both NASS's and GfK Kynetec's data because they are more confident in the data's accuracy if the data can be checked against another source. Similarly, Iowa Department of Agriculture and Land Stewardship officials said they use NASS's data to validate their own pesticide sales data, which are collected from pesticide dealers, since the state agency does not have the authority to audit pesticide dealers to validate their data. Moreover, several ACU data users said that agricultural chemical sales data are not an adequate substitute for application data. For example, the Director of the North Central Integrated Pest Management Center said that sales data are not sufficient to gauge the impact of pest management practices because sales and application may not be equivalent. When soybean rust was identified in the United States in 2004, for instance, she said that farmers proactively purchased fungicides to defend against this outbreak, although they did not necessarily apply the fungicides.

NASS May Not Be Fully Leveraging Resources or Minimizing Overlap Due to Limited Knowledge of Other Publicly Available Data

Although NASS cited the availability of other data sources as one of its criteria for cutting the ACU program in fiscal year 2007, NASS officials said they never systematically identified and assessed those data sources before or after making this decision. Furthermore, while agency officials said that NASS field staff work closely with state departments of agriculture to coordinate data collection efforts between federal and state entities, we found that NASS has not comprehensively monitored state agricultural chemical usage data sources. As a result, NASS does not know the extent to which ACU data might overlap with other publicly available sources and cannot be certain that it is fully leveraging limited government resources to maximize the data's usefulness and minimize cost. Similarly, a NASS official said that the agency is not certain whether other NASS data programs have overlap with other publicly available data. OMB guidance directs federal agencies to (1) seek to satisfy new information needs through intergovernmental sharing of information, or through commercial sources, where appropriate; (2) only collect or create information that is both necessary for the proper performance of agency functions and which has practical utility; and (3) disseminate information in a manner that balances the goals of maximizing the information's

usefulness and minimizing cost.²⁵ In addition, USDA's strategic plan declares that success depends on working cooperatively at all government levels and directing resources to where they are used most effectively.²⁶ NASS's strategic plan also specifies that, through its field offices, the agency is intended to eliminate duplication of effort with state departments of agriculture and minimize overall costs to federal and state governments in meeting agricultural data needs at both the federal and state levels.

A NASS official said the agency complies with OMB's guidance by seeking to utilize all available resources, including other data series, in order to provide the most timely, accurate, and useful statistics on agriculture. We found that NASS has taken measures to reduce overlap and leverage resources with California, where a state agency already collects and disseminates free, detailed pesticide application data. Specifically, NASS officials said that NASS reduces the cost and burden on farmer respondents associated with its ACU data program by collecting some of California's data from county agricultural commissioners to supplement NASS's own data collection activities. Additionally, NASS reduces overlap with Arizona by obtaining some pesticide data from that state's department of agriculture, which collects data on restricted-use pesticide usage from pesticide managers. However, NASS enumerators still survey farmers in that state to collect ACU data on nonrestricted pesticide usage, as well as fertilizer usage. Otherwise, because ACU data cover only chemical application, rather than sales, NASS officials said that state sources of pesticide and fertilizer sales data do not overlap with NASS's program because the agency does not consider sales to be comparable to application.

However, NASS officials said that they were not familiar with all state-initiated efforts to collect and disseminate agricultural chemical application data. For example, NASS officials said they were not aware that New York has collected and disseminated pesticide application and sales data, which include names of active ingredients, pesticide product name, and total amount applied, since 1998. In addition, we found that New Jersey has collected and disseminated pesticide application data, including names of active ingredients and total amount applied, since 1985. NASS officials said they were aware of this program but hadn't

²⁵OMB Cir. No. A-130.

²⁶U.S. Department of Agriculture, *Strategic Plan for FY 2010-2015*.

assessed whether these data overlap with ACU data or explored whether coordination between NASS and New Jersey would be appropriate, in part because they did not know whether the state's sample size would meet NASS's statistical standards. While NASS officials acknowledged that one of the agency's goals is to reduce overlap, costs, and respondent burden, we found that the agency does not have a process in place to ensure all field offices are monitoring agricultural chemical usage data sources in their states. Consequently, without information on all state and other publicly available agricultural chemical usage data sources, NASS does not have assurance that the agency is fully leveraging limited government resources, maximizing efficiencies, and minimizing potential overlap in its ACU data collection.

Conclusions

In the 20 years since its inception, NASS's ACU program has supported many federal and state government efforts, including monitoring water pollution under the Clean Water Act and measuring the success of integrated pest management efforts. As Congress debates greenhouse gas regulation, reliable data on pesticide and fertilizer usage could also provide critical information on agriculture's role in climate change. Users also rely on ACU data to support a variety of U.S. business needs, including research and development of new agricultural pesticide and fertilizer products and access to foreign agricultural markets. Furthermore, because consumers are increasingly interested in information about the food and products they consume and how those items are produced, ACU data are likely to become even more relevant in the future. Without ACU data, regulators, legislators, industry, consumers, and researchers alike would be uncertain about the extent of pesticide and fertilizer use—which, in turn, would deny policymakers important information needed to make decisions on protecting food safety and the environment.

Because NASS cut the ACU program in fiscal year 2007 without consulting users, it discovered only through the subsequent outpouring of support for the program how critical ACU data are to a wide array of public, private, and nonprofit entities. Without an effective, formal mechanism to identify users and seek their feedback, the agency is unable to assess whether the data meet users' informational needs or make fully informed decisions considering the effects of potential program changes on users, while weighing the costs and benefits of such changes. In addition, without a mechanism to gather and evaluate input from users on an ongoing basis, NASS cannot be assured that ACU data continue to be relevant as new regulatory and public needs for information arise. Furthermore, we and

several data users had difficulty locating ACU reports, data tools, and related ACU resources on NASS's Web site, which, in combination with incomplete data tools, limits the visibility and user-friendliness of the ACU program. In an increasingly technology-driven world, it is important for users to easily access and use information electronically.

Moreover, as federal and state government agencies are faced with budget constraints, it is important to reduce unnecessary overlap in government programs and to maximize the public benefit while minimizing cost. However, NASS may be missing opportunities to better leverage federal and state resources. First, because NASS has not widely communicated its ability to enter into cooperative agreements with state agencies, it may be missing opportunities to be reimbursed by states for the costs associated with collecting additional information that ACU data users have said would enhance the data's usefulness. Second, although NASS has collected some information on other publicly available data sources and has coordinated with California and Arizona to reduce overlap, the agency has not systematically identified and evaluated whether other publicly available data on agricultural pesticide and fertilizer usage exist. Without a process in place to ensure that all field offices are monitoring other publicly available information sources, NASS does not have assurance that the agency has maximized efficiencies and minimized potential overlap with its ACU data collection.

Recommendations for Executive Action

To improve NASS's ability to manage the ACU data program effectively and ensure that it continues to meet users' needs, we recommend that the Secretary of Agriculture direct the Administrator of NASS to take the following four actions:

- Establish a formal mechanism to identify and consult ACU data users on an ongoing basis to ensure ACU data continue to meet users' informational needs and to consider the effects of potential program changes on users, weighing the costs and benefits of those changes.
- Strengthen outreach to state agencies regarding NASS's ability to enter into reimbursable cooperative agreements that would maximize state and federal resources, minimize costs, and enhance ACU data's usefulness to state officials.

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- Improve users' ability to access and use ACU data on NASS's Web site by making it easier to find ACU reports, data tools, and related resources, and by updating ACU data tools on a timely basis.
 - Develop a process to systematically identify and evaluate other agricultural pesticide and fertilizer usage data sources that are publicly available on an ongoing basis to better leverage resources and reduce areas of potential overlap with ACU data collection.

Agency Comments and Our Evaluation

We provided a draft of this report to USDA for review and comment. In written comments, which are included in appendix III, USDA agreed with the recommendations and stated that the report and recommendations will be used to further strengthen NASS and its management of the ACU program. Regarding the first recommendation, USDA indicated that NASS will (1) include ACU data as an agenda item at an annual data users meeting where all statistical data series are open for discussion; (2) convene a special data users meeting during 2011 to focus specifically on the ACU data series; and (3) conduct a comprehensive market research effort to enable it to better understand its customers/audience and their information needs. Regarding the second recommendation, USDA stated that NASS will leverage its ongoing relationship with NASDA to reach outside the agriculture community into other sectors of local and state government with responsibilities for pesticide regulations and oversight. In addition, USDA said an inventory of available agricultural chemical use data collections will be made and monitored to minimize duplicative efforts. Regarding the third recommendation, USDA indicated that NASS is actively working to improve its online database, Quick Stats, for the presentation of all NASS data series, including ACU data, and that an internal NASS team has been chartered to review data user comments aimed at improving functionality and ease of use for all data users. Regarding the fourth recommendation, USDA stated that NASS headquarters personnel with ACU responsibility will (1) annually review known public sources of fertilizer and pesticide information for updated and expanded data items and (2) coordinate with NASS field office personnel to identify new data series available at local levels. According to USDA, these efforts will build off of the results from the agency's response to the second recommendation. USDA did not provide any suggested technical corrections.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to the appropriate congressional committees, the Secretary of Agriculture, and other interested parties. The report also will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or shamesl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.



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Appendix I: Objectives, Scope, and Methodology

Our objectives were to determine (1) the factors that the U.S. Department of Agriculture's (USDA) National Agricultural Statistics Service (NASS) considered in reducing the Agricultural Chemical Usage (ACU) program in fiscal years 2007 through 2009; (2) how ACU data users were affected by the temporary cutback, and their views on the quality and usefulness of the data; and (3) the extent to which agricultural pesticide and fertilizer usage data are available from sources other than NASS.

To address all three objectives, we reviewed relevant NASS documents, as well as USDA strategic and performance plans. We also reviewed Office of Management and Budget (OMB) guidance to federal agencies on managing information resources; promoting transparency, public participation, and collaboration in government; and improving Web sites to better serve users and customers. To understand how and why the Environmental Protection Agency (EPA) and other federal agencies use ACU data, we also reviewed relevant documents from those agencies. In addition, to determine other USDA agencies' roles in using ACU data, we spoke with officials from the Economic Research Service, the Farm Service Agency, the Natural Resources Conservation Service, the Agricultural Research Service's Office of Pest Management Policy, the Agricultural Marketing Service, and the Animal and Plant Health Inspection Service. To describe NASS's authority to collect agricultural statistics data and, more specifically, pesticide use data, and to describe federal and state responsibilities in implementing certain laws to protect human health and the environment, we reviewed relevant federal laws. In addition, we reviewed our prior reports that were appropriate for this review, such as those relating to the origins of the ACU data program, challenges faced by federal agencies operating under continuing resolutions, and the importance of ensuring that information on federal agency Web sites is accessible and user-friendly. We also reviewed the annual reports containing findings and recommendations made by the NASS Advisory Committee on Agricultural Statistics from 2003 through 2009 and, in particular, the reports related to its 2006 Subcommittee on Pesticide Use Data. We also interviewed key NASS headquarters officials knowledgeable about the ACU program and reviewed NASS's internal controls for the information system that stores ACU data. However, we did not review other agricultural pesticide or fertilizer usage data sources' internal controls. Furthermore, because we are not using NASS's or other sources' data in this report, we did not assess the reliability of ACU or other sources' data. For the section on cooperative agreements, we converted all cooperative agreement amounts to constant 2010 dollars to calculate the total across multiple years. We adjusted the cooperative agreement amounts for inflation using the gross domestic product price index from

the U.S. Bureau of Economic Analysis and the Congressional Budget Office's inflation projection for the year 2010.

To obtain ACU data users' views for all three objectives, we interviewed and reviewed documents from a nongeneralizable sample of 25 ACU data users. We selected these users from a variety of sectors, including federal, state, private, nonprofit, and academic, in order to provide a broad range of perspectives on the use of ACU data. Specifically, we interviewed ACU data users from federal agencies other than USDA, state agencies and their representative associations, industry groups representing chemical manufacturers, commodity groups, public interest organizations, and academic researchers. Because NASS does not maintain a list of ACU data users, we initially identified users in all categories through (1) letters written by users urging USDA to restore the ACU program, (2) news articles about the ACU program's cutback, and (3) interviews with NASS officials and others. Using a snowball sampling technique, at each interview, we solicited additional ACU data user names and contact information until we had coverage from users across all sectors. To further assist in identifying academics, we conducted a literature search for peer-reviewed articles citing ACU data since 2005. From among the list of ACU data users we identified through this process, we selected at least three users from each category. When possible, we selected national organizations that represent state agencies, chemical manufacturers, and commodity groups—such as the National Association of State Departments of Agriculture, CropLife America/CropLife Foundation, The Fertilizer Institute, and the Minor Crop Farmer Alliance—because of their breadth of members across the country. In addition, three of the users we interviewed were also members of the 2006 NASS Advisory Subcommittee on Pesticide Use Data: officials from the CropLife Foundation and EPA's Office of Pesticide Programs, as well as a researcher from the Michigan State University Department of Etymology. We selected these subcommittee members, in part, because of their firsthand knowledge of the subcommittee's findings and recommendations to NASS regarding ACU data and because NASS cited the subcommittee's work in the agency's decision to cut the ACU program in fiscal year 2007.

In conjunction with the methods identified above, we used additional selection criteria for certain categories of ACU data users. For example, we selected

- states to ensure diversity in agricultural production and geographic location and, in one case, on the basis of a state's entering into a cooperative agreement with NASS;

- commodity groups to ensure diversity of crop representation;
- three public interest organizations who were among the four major signatories on letters to USDA in support of the ACU program; and
- academics through a variety of methods. One academic was identified through referral and selected based on his membership in the 2006 NASS Advisory Subcommittee on Pesticide Use Data. Another academic was identified through the literature search and selected because he was the only author we found who had published multiple articles citing ACU data since 2005, was employed by a U.S. university, and was not a graduate student. The third academic was identified through referral and selected because she was quoted in a media article discussing the ACU data cutback.

For all ACU data user categories, information from our nongeneralizable sample cannot be used to make inferences about the entire ACU data user population. In addition, we did not assess the extent to which the users access or use ACU data (i.e., lightly, moderately, or heavily) as part of our selection criteria. Table 3 lists the ACU data users we interviewed.

Table 3: ACU Data Users Selected for Interview, by Type

Type	User
Federal agencies	EPA Office of Pesticide Programs EPA Office of Water U.S. Fish and Wildlife Service, Department of the Interior U.S. Geological Survey, Department of the Interior National Marine Fisheries Service, Department of Commerce
State agencies and representative associations	California Department of Food and Agriculture Florida Department of Agriculture and Consumer Services Iowa Department of Agriculture and Land Stewardship Michigan Department of Agriculture Texas Department of Agriculture Washington State Department of Agriculture Association of American Pesticide Control Officials National Association of State Departments of Agriculture
Chemical manufacturer industry groups	American Phytopathological Society Public Policy Board industry members, representing pesticide manufacturers CropLife America/CropLife Foundation, representing pesticide manufacturers The Fertilizer Institute, representing fertilizer manufacturers

Appendix I: Objectives, Scope, and Methodology

Type	User
Commodity groups	Minor Crop Farmer Alliance, representing fruit, vegetable, nut, and other minor crop growers National Corn Growers Association Society of American Florists and the American Nursery & Landscape Association, interviewed together
Public interest organizations	Center for Food Safety Natural Resources Defense Council The Organic Center
Academic researchers	The Director of the North Central Integrated Pest Management Center at the University of Illinois, Urbana-Champaign A research faculty member from the Biological and Agricultural Engineering Department at the University of Idaho A professor from the Department of Etymology at Michigan State University

Source: GAO.

We used a standard set of questions to interview each of these users to ensure we consistently captured their views on various aspects of each of our objectives. We then analyzed the results of these interviews and related documents to identify the main themes and develop summary findings. Two GAO analysts separately conducted this analysis and placed users' responses into one or more categories, then compared these analyses. All initial disagreements regarding the categorizations of users' responses were discussed and reconciled. The analysts then tallied the number of responses in each category. To characterize ACU data users' views throughout this report, we defined modifiers (e.g., "nearly all") to quantify users' views as follows:

- "nearly all" users represents 21 to 24 users,
- "most" users represents 16 to 20 users,
- "many" users represents 11 to 15 users,
- "several" users represents 6 to 10 users, and
- "some" users represents 3 to 5 users.

To determine the extent to which agricultural pesticide and fertilizer usage data are available from sources other than NASS, we developed and distributed a questionnaire to collect information from these data sources and used the responses to describe certain attributes of their data. To develop the questions, we analyzed NASS's ACU data documentation to identify the proper terminology used for agricultural chemical use data

and to determine what characteristics of the other data sources were relevant to this review. Because there is no comprehensive list of sources of agricultural chemical use data, we identified as many other sources of agricultural chemical use data as possible through interviews, document review, and outreach to members of the Association of American Pesticide Control Officials. However, we cannot know whether we identified all sources and, therefore, we cannot know whether the results are generalizable to any other existing data sources. We contacted representatives of these sources by phone and e-mail to ensure that they met the following criteria: (1) they collect and disseminate data on the application, sale, or both of agricultural pesticides, fertilizers, or both on an ongoing basis; (2) they collected and disseminated such data in the last 5 years; (3) they operate in the United States; and (4) they make their data available to users outside their organization. In addition, for data sources that disseminate agricultural chemical application data by crops, the data had to cover eight or more crops.

Ultimately, we identified 12 state, private, and other data sources that met these criteria. Each data source selected an appropriate official to complete the questionnaire. To minimize errors that might occur from respondents interpreting our questions differently from our intended purpose, we pretested the questionnaire in-person or by phone with a federal government agency, a state government agency, a private company, and a nonprofit organization. During these pretests, we asked officials to complete the questionnaire as we observed the process. We then interviewed the respondents to ensure that (1) the questions were clear and unambiguous, (2) the terms used were precise, (3) the questionnaire did not place an undue burden on the officials completing it, and (4) the questionnaire was objective and unbiased. We also tested the functionality of the questionnaire and submitted it to review by a GAO questionnaire methodology expert and two external reviewers who were familiar with agricultural pesticide and fertilizer usage data and their use. We modified the questions based on feedback from the pretests and reviews, as appropriate. We then asked respondents to complete the questionnaire within an electronic form and return it as an e-mail attachment.

Overall, there was a 100 percent response rate, as all 12 recipients and NASS completed questionnaires. Two of these data sources completed two questionnaires each, since these data sources collect and disseminate both sales and application data using different methodologies. We reviewed all questionnaire responses, and followed up by phone and e-mail to clarify the responses, as appropriate. In order to categorize and summarize these

responses, we performed a systematic content analysis. The responses were coded, entered into a spreadsheet, independently checked for accuracy, and analyzed to count how many data sources have various attributes. We also sent the descriptive summaries to each data source other than NASS to review for accuracy and, in some cases, to provide further clarification, and we incorporated their comments as appropriate. We did not independently verify the information provided by these data sources.

We conducted this performance audit from October 2009 to November 2010, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Other Sources of Agricultural Chemical Usage Data

As part of our review, we identified and collected information on sources of agricultural chemical usage data other than the U.S. Department of Agriculture's (USDA) National Agricultural Statistics Service (NASS). As of September 2010, we found seven states, three companies, one nonprofit organization, and one other federal agency that collect and disseminate agricultural chemical usage data in the United States. This appendix describes the information that each of these sources provides. We collected this information using a questionnaire that we distributed to officials from the agencies, companies, and organizations that produce these data. Table 4 shows how language from the questionnaire is used in this appendix.

Table 4: Terms Used in This Appendix and Questionnaire Definitions

Term	Definition from Questionnaire
Application rate	Average amount per area per application (rate per application)
By mail	CD-ROM, DVD, or paper by mail
Chemical dealers	Pesticide and/or fertilizer distributors and/or dealers, wholesale or retail
Chemical manufacturers	Pesticide and/or fertilizer manufacturers or their representative trade organizations
Commodity groups	Commodity or producer groups/associations
Conferences	Conferences and/or seminars
Data Center	In-person visit to data center/laboratory
Document review	Document/record review, such as farm record or sales receipts
Farmers	Farmers, farm owners/operators, employees, or contractors, such as bookkeepers, custom/licensed applicators, or pest control managers
Federal requirements	Federal laws or regulations
Foreign governments	Foreign government or international governing bodies, such as the United Nations
Lawyers	Lawyers or law firms
Online tool	Web-based comment box or pop-up survey
Presentation	In-person presentation
Reports from other entities	Reports from other entities that collect data, including but not limited to state or local government
Sales by chemical dealers to users	Sales by dealers/distributors to end users
Sales by chemical manufacturers to dealers	Sales by pesticide and/or fertilizer manufacturers to dealers/distributors
Sales by chemical manufacturers to users	Sales by pesticide and/or fertilizer manufacturers to end users
State requirements	State laws or regulations
Telephone calls and e-mails	E-mails and/or phone calls from users
Timing of application with respect to planting or seeding	Whether pesticides and/or fertilizers were applied before, at, or after planting/seeding

Source: GAO.

Attributes of the state, private, and other data sources that we identified, as reported by officials from the relevant agency, company, or organization, are described below. Unless otherwise stated, all information from these sources in this appendix has not been independently verified by GAO.

State Data Sources

As of September 2010, we found seven states that have ongoing programs to collect and disseminate data on the use of agricultural pesticides, fertilizers, or both: Arizona, California, Iowa, Minnesota, New Jersey, New York, and Washington.

Arizona

According to officials from the Arizona Pest Management Center (APMC) at the University of Arizona, the center analyzes and publishes agricultural pesticide application data collected by the Arizona Department of Agriculture (ADA) for that state. ADA is required by law to collect some pesticide use data from farmers, pest control advisors, and custom pesticide applicators within the state. As of September 2010, APMC had archived 20 years of historical data from ADA and was building an historical database of Arizona pesticide use data, which it periodically updates with newly reported data from ADA. APMC also makes this data available through published reports. Data elements in published reports vary, but they often include names of active ingredients in applied pesticides, pesticide product names, acres treated, number of applications, application rate, total amount applied, cost information, and dates of application. The data are presented at both state and county levels and generally cover the state of Arizona. The data are disseminated by crop: APMC historical pesticide use database has information on over 150 crops, and published reports cover over 24 crops. The data are not disseminated by livestock species. APMC collects and disseminates these data to fulfill mission-related responsibilities and to evaluate integrated pest management programs. It has disseminated these data routinely since 2006, though ADA has collected the data since at least the early 1990s. The data are disseminated through Web downloads, e-mail, phone, and presentations.¹ There is no regular dissemination schedule. Published reports are available for free, with no restrictions on their use. Data users include farmers, academics, chemical manufacturers, commodity groups,

¹As of September 2010, the full database was not available on the Web. However, the APMC publishes reports on the Arid Southwest IPM Network Web site and responds to information requests from researchers, companies, and other entities.

public interest organizations, lawyers, news media, the federal government, state government, and local government. APMC identifies these users through user requests for data and citations in published articles. APMC gathers feedback two to three times per year through an advisory committee, as well as on an ad hoc basis through user group meetings and phone calls and e-mails from users.

California

According to California Department of Pesticide Regulation (CDPR) officials, the agency produces free pesticide application data and pesticide sales data in separate reports—*California Pesticide Use* and *Annual Pounds of Pesticides Sold in California*—and in other specialized reports by request for a fee. Both reports cover the entire state of California and provide data at the state, county, watershed, farm, and field levels, while the *California Pesticide Use* report also presents data at the square mile level. Both reports disseminate data by crop, covering more than 200 crops, and by livestock species, covering 12 species.

CDPR's application data elements include the names of active ingredients in applied pesticides, pesticide product names, application method, number of planted acres, area applied, number of applications, application rate, total amount applied, dates of application, geographic location, and grower identification number. Meanwhile, CDPR's sales data include the names of active ingredients in pesticides sold, amounts of pesticides sold, sales by chemical manufacturers to chemical dealers, and sales by chemical dealers to users.

CDPR's purposes for collecting and disseminating both application and sales data are to support state requirements and mission-related responsibilities, as well as business purposes and research by environmental groups and other government agencies. CDPR collects the application and sales data continuously from farmers, academics, federal government agencies, state government agencies, and local government agencies. Pesticide users in California must report applications to CDPR, excluding household pesticide use. Pest control businesses are required to report applications to their county agricultural commissioner within 1 week of use, and farmers must report by the tenth day of the following month. County agricultural commissioners then submit the data to CDPR. The application and sales data were first disseminated in 1950. Both data sets are disseminated through Web downloads, e-mail, fax, mail, telephone, presentations, and computer laboratories. The application and sales data are published once per year, though users may request the data or access them on CDPR's Web site at any time. There are no restrictions on the use of the data. Application and sales data users include farmers,

academics, chemical manufacturers, commodity groups, public interest organizations, academics, lawyers, news media, the federal government, and foreign governments, while application data users also include state and local governments. CDPR identifies these data users through data requests and citations in published articles. The agency gathers feedback from them on an ad hoc basis through individual and group meetings, online tools, conferences, telephone calls, and e-mails.

Iowa

According to Iowa Department of Agriculture and Land Stewardship (IDALS) officials, the agency collects and disseminates pesticide sales data covering that state. These data show pesticide sales at the state, county, and watershed levels. The data contain the names of active ingredients in pesticides and amounts of pesticides sold. They are not released by pesticide product sales amount because Iowa law generally prohibits the release of certain information IDALS collects. Consequently, IDALS converts this information to approximate pounds of active ingredient or a statewide dollar amount by active ingredient before it releases the data. Although sales information cannot generally be tied to specific crops, Iowa's pesticide sales data can be disseminated by crop when matched with the NASS's Agricultural Chemical Usage (ACU) data; according to IDALS, researchers compare the two data sets to determine where pesticides were used on certain crops within Iowa. The data are not disseminated by livestock species. IDALS collects and disseminates these data to provide information to pesticide, water quality, and public health researchers. The data are collected from licensed pesticide dealers, who must report all sales of pesticide products with at least \$3,000 in sales to IDALS at the time of their annual license renewal. IDALS first disseminated these data in 2004, though its database contains historical information going back to 1989. The data are disseminated through e-mail and other electronic methods to the Iowa Department of Natural Resources, which provides interactive maps based on the data. So far this information has not been widely distributed to the public at large—it is available by request and is used by academic researchers, academics, the federal government, and state government. However, IDALS plans to make this information publicly available on the Iowa Department of Natural Resources' Web site, which, as of August 2010, contained a pilot version of the interactive maps and database. There is no established schedule for data dissemination. IDALS generally disseminates the data to users free of charge, and the pilot version of the interactive maps and database on the Iowa Department of Natural Resources' Web site is available for free, but IDALS provides data to entities other than state and federal agency partners for a fee. IDALS does not restrict how the data may be used, though it cautions users about the data's flaws and limitations, such as the

lack of statistical validity and statutory limitations on reporting thresholds. IDALS receives feedback from data users on an ad hoc basis through meetings with individual data users, conferences, telephone calls, and e-mails.

Minnesota

According to Minnesota Department of Agriculture (MDA) officials, the agency produces pesticide and fertilizer application data through the Minnesota Farm Nutrient Management Assessment Program reports and pesticide sales data through Minnesota Pesticide Sales Information reports. The purpose of these reports is to fulfill state requirements and mission-related responsibilities. The Farm Nutrient Management Assessment Program reports cover select watersheds or regions within Minnesota, while the pesticide sales information covers the entire state of Minnesota. Both reports are available to users free of charge, without restrictions on their use. Data users include farmers, academics, chemical manufacturers, commodity groups, public interest organizations, academics, lawyers, news media, state government, and local government. MDA obtains feedback from data users annually through the state's Pesticide Management Plan Committee, and on an ad hoc basis through user group meetings, meetings with individual data users, conferences, telephone calls, e-mails, and agency committees.

The Farm Nutrient Management Assessment Program data were first disseminated in 1992. These data are available at the level of specific watersheds and regions. Data elements for the majority of such data collection efforts include names of active ingredients in applied pesticides and nutrients in applied fertilizers, pesticide product names, application methods, number of planted acres, area applied, number of applications, application rates, total amount applied, and timing of application with respect to planting or seeding. The data are disseminated by crop and have covered at least eight crops. The data are not disseminated by livestock species. MDA collects these data via face-to-face interviews with farmers, based on an identified agency need or at the request of an interested third party, such as a local watershed group, commodity group, academic researcher, or other state agency interested in nutrient and pesticide data. There is no set schedule for collecting or disseminating these data. Dissemination methods include Web download, mail, e-mail, and presentations.

The Pesticide Sales Information reports were first disseminated in 1991. These reports present data at the state level only. Data elements include the names of active ingredients in pesticides sold and the amounts of pesticide sold. These data are not generally disseminated by crop, as crop

type cannot always be discerned from sales information, but occasionally sales data associated with a single crop are reported when an agricultural pesticide is used only on that crop. The data are not disseminated by livestock species. MDA receives the sales data from pesticide registrants through mandatory sales reports; registrants must report pesticide product sales in the state, as well as the associated total dollar amount. MDA collects this information annually from chemical distributors and chemical manufacturers. The agency uses information reported by these entities to determine the amount of active ingredient sold. The Pesticide Sales Information reports are disseminated annually and are available through Web download, e-mail, and presentations by MDA officials at MDA meetings and education and outreach functions.

New Jersey

According to New Jersey Department of Environmental Protection officials, the New Jersey Pesticide Control Program produces agricultural pesticide application data covering that state. The data cover both restricted use and general use pesticide products, and the data elements include the names of active ingredients in applied pesticides, application methods, and total amounts applied. Data are presented at the state, county, watershed, and township levels. They are disseminated by crop, and 32 crops are included. The data are not disseminated by livestock species. The purpose of this program is to fulfill federal requirements, state requirements, and mission-related responsibilities. State regulations mandate that pesticide applicators maintain records for a minimum of 3 years, and that they provide those records to the New Jersey Department of Environmental Protection upon request. The agency collects pesticide application data from licensed private pesticide applicators through document review, site inspection, and questionnaires. The New Jersey Pesticide Control Program develops reports from these data, which are disseminated once every 3 years through Web download, mail, e-mail, presentations, and a data center. The reports are disseminated free of charge, with no restrictions on their use. They were first disseminated in 1985. Data users include farmers, academics, commodity groups, public interest organizations, academics, lawyers, news media, the federal government, state government, and local government. Users are identified through data requests and citations in published articles. The agency does not gather feedback from data users on these data.

New York

According to New York State Department of Environmental Conservation officials, the agency's Pesticide Reporting Program produces agricultural pesticide application and sales data covering that state. Data elements include names of active ingredients in pesticides applied and sold, pesticide product names, total amounts applied, amounts of pesticide sold,

sales by chemical manufacturers to chemical dealers, and sales by chemical dealers to users. The data are presented at the state, county, and zip code levels. They are not disseminated by crop or livestock species. Applicators are required by a state environmental law to submit reports under the pesticide reporting program. The data are collected through prescribed annual report forms, submitted by chemical dealers, chemical manufacturers, and commercial pesticide applicators. In addition, the New York State Department of Environmental Conservation collects sales reports from commercial permit holders that detail the sales of pesticides used in agricultural crop production. The application and sales data have been disseminated annually since 1998 and are available through Web download and presentations. The data are provided free of charge, and there are no restrictions on their use. Data users include academics, public interest organizations, academics, and state government. Users are generally identified through data requests and, although the agency generally does not gather feedback from data users, it posted a user survey in 2002.

Washington

According to Washington State Department of Agriculture (WSDA) officials, the agency's Pesticide Use Project produces agricultural pesticide application and fertilizer sales data covering the state of Washington. Data elements include names of active ingredients in applied pesticides, names of nutrients in applied fertilizers, number of planted acres, acres treated, number of applications, application rate, and total amount applied. The data are presented at the state level only and are not disseminated by crop or livestock species. WSDA first disseminated the data in 2003 to provide the U.S. Environmental Protection Agency (EPA) with information necessary to conduct risk assessments related to the Endangered Species Act (ESA). According to WSDA officials, the purpose of the Pesticide Use Project is to fulfill federal requirements, state requirements, and mission-related responsibilities. Specifically, WSDA uses the data for risk assessments related to EPA requirements and biological opinions related to ESA compliance. The data are collected through document review, questionnaires, reports from other entities, and cooperative agreements with NASS. WSDA collects the data once every 3 years from farmers, chemical dealers, commodity groups, and the federal government. The agency considers the data to be anecdotal, in part due to the small sample size of the data that it collects. The data are disseminated by mail, e-mail, telephone, and presentations. There is no established dissemination schedule. The data are available free of charge, and there are no restrictions on their use. Data users include academics, commodity groups, public interest organizations, the federal government, state government, and local government. WSDA identifies these users through

requests for data and citations in published articles and, as of July 2010, the agency was implementing a log-in registration process. The agency does not gather feedback from data users.

Private Data Sources

Three companies collect and disseminate data on the use of agricultural pesticides, fertilizers, or both: Crop Data Management Systems (CDMS), GfK Kynetec, and Mike Buckley & Associates.

CDMS

According to CDMS officials, the company produces agricultural pesticide and fertilizer application and sales data covering multiple U.S. states. Data elements include the names of active ingredients in pesticides applied and sold, names of nutrients in fertilizers applied and sold, pesticide product names, fertilizer product names, application methods, number of planted acres, acres treated, number of applications, application rates, total amounts applied, cost information, dates of applications, timing of applications with respect to planting or seeding, who applied the chemicals, and amounts sold. The data are presented at the state, county, watershed, farm, and field levels, as well as custom areas that may be requested by a client. The data are disseminated by specific crops and crop categories, covering over 100 crop categories. The data are not disseminated by livestock species. CDMS uses software to collect the data. The company collects the data from chemical dealers, chemical manufacturers, commodity groups, chemical applicators, and farmers. Data are collected annually, quarterly, monthly, daily, and in real time. CDMS has disseminated the data since 1994, and dissemination methods include Web download, mail, e-mail, fax, telephone, presentations, and other electronic options. Data are disseminated annually, quarterly, monthly, weekly, daily, and in real time, depending on the client's needs. Users pay a fee for the data, and there are restrictions on how the data may be used, based on individual agreements with each client. Data users include farmers, academics, chemical manufacturers, commodity groups, crop consultants, chemical applicators, academics, the federal government, and state governments. Users are identified through log-in registration, online tools, subscription-based user information, and data requests. CDMS gathers feedback from users regularly and on an ad hoc basis, through user group meetings, meetings with individual data users, online tools, conferences, telephone calls, and e-mails.

GfK Kynetec

According to GfK Kynetec officials, since acquiring Doane Market Research in January 2010, the company has produced agricultural pesticide application and sales data covering multiple U.S. states in its Syndicated U.S. Studies. Prior to the acquisition, Doane Market Research

had produced these data since 1954. Data elements include the names of active ingredients in pesticides applied and sold, pesticide product names, application methods, number of planted acres, acres treated, number of applications, application rates, total amounts applied, cost information, timing of applications with respect to planting or seeding, who applied the chemicals, crop stages of application, sales by chemical dealers to users, amounts sold, target weeds or pests, pesticide application sequence, tank mixing partners, seed treatments, and seed trait of target crop.² The data are presented nationwide and by state, agricultural statistics district, and county. GfK Kynetec disseminates data by crop and livestock species; the company's own data collection covers 61 crops and 7 livestock species, and it also reformats and sells some of CDPR's data, covering 216 crops.

GfK Kynetec collects the data annually, quarterly, monthly, and weekly, through questionnaires and reports from other entities. The company collects data from farmers, chemical dealers, chemical manufacturers, commodity groups, academics, state government, and local government. It disseminates the data annually on a regular schedule, and dissemination methods include Web download, mail, e-mail, and presentations. Users pay a fee for the data, and there are restrictions on how the data may be used; for example, the data cannot be released to the public or put in the public record. Users of GfK Kynetec's data include academics, chemical manufacturers, commodity groups, lawyers, and the federal government. The company identifies users through log-in registration, subscription-based user information, and data requests. It gathers feedback from data users once per year and also gathers feedback on an ad hoc basis. Feedback mechanisms include user group meetings, telephone calls, and e-mails.

Mike Buckley & Associates

According to the company's president, Mike Buckley & Associates collects and disseminates agricultural pesticide application and sales data covering all U.S. states, as well as Canada and Mexico. Data elements include names of active ingredients in pesticides applied and sold, pesticide product names, application methods, number of planted acres, areas applied, cost information, dates of application, timing of application with respect to planting or seeding, season of application, amounts of pesticide sold, cost information, and sales by chemical manufacturers to users. The

²A pesticide application sequence is the sequence of products used on a given piece of land. A tank mix is an application of two or more products at once. Seed trait is an identifier for the type of genetically modified seeds.

company disseminates data by crop, but not livestock species. Its agricultural chemical usage studies cover 32 crops, and it also undertakes seed treatment studies, which cover 16 crops. The data are presented at the state level only. The company collects data annually from farmers, chemical dealers, pesticide manufacturers, commodity groups, academics, state government, and local government. The data are collected through document reviews, site inspections, questionnaires, and reports from other entities. Mike Buckley & Associates first disseminated the data in 1990. The data are disseminated annually through the mail and presentations. Users pay a fee for the data, and there are restrictions on how the data may be used. Specifically, the company maintains ownership of all data produced in multiclient studies; subscribing clients generally purchase the rights to access the data for internal use only, but exceptions may be granted to support regulatory and legal filings. Data users include chemical manufacturers, commodity groups, public interest organizations, federal government, foreign governments, and consulting firms. The company identifies its data users through subscription-based user information, data requests, and citations in public articles. It gathers feedback from users regularly and on an ad hoc basis through user group meetings, meetings with individual data users, conferences, telephone calls, and e-mails. Regularly scheduled feedback is gathered quarterly and annually.

Other Data Sources

We also found one nonprofit organization, the Association of American Plant Food Control Officials (AAPFCO) that collects and disseminates agricultural fertilizer usage data, and one federal agency other than NASS, EPA, that collects and disseminates agricultural pesticide usage data.

AAPFCO

According to an AAPFCO official, the organization produces agricultural fertilizer sales data covering all U.S. states. The organization collects data through reports from its members, who include state fertilizer control officials. Additionally, AAPFCO estimates the fertilizer sales information for a few states that do not collect such information based on sales in surrounding states. Data elements include the names of nutrients in fertilizers applied and sold, fertilizer product names, amounts of fertilizer sold, sales by chemical manufacturers to chemical dealers, sales by chemical dealers to users, and sales by chemical manufacturers to users. However, data elements vary from state to state due to differences in the information that AAPFCO receives from state agencies. The data are presented at both state and county levels but are not disseminated by crop or livestock species. The organization collects and disseminates fertilizer sales data for business purposes and mission-related responsibilities.

AAPFCO first disseminated these data in 1995, when it began this effort as a joint project with The Fertilizer Institute—an organization representing fertilizer manufacturers—after the Tennessee Valley Authority, which had disseminated the data since 1985, discontinued managing the data program. AAPFCO disseminates the data annually and upon request, by mail, e-mail, and fax. Most of AAPFCO's data are disseminated at a cost; both printed reports and electronic data sets are provided to users at what the organization considers to be a nominal fee. However, there are no restrictions on how the data may be used. Data users include academics, chemical manufacturers, commodity groups, public interest organizations, lawyers, and the federal government. AAPFCO identifies these users through data requests and does not gather feedback from its data users.

EPA

According to EPA officials, the agency produces *Pesticides Industry Sales and Usage* reports, which present global data on agricultural and nonagricultural pesticide active ingredient pounds applied and sold, including all U.S. states. Regarding agricultural pesticides specifically, data elements included in these reports include the names of the top active ingredients applied and sold, total amounts applied, and sales by chemical dealers to users. The reports do not present data by crop or livestock species. The data are summarized at the world and U.S. national levels. The purpose of these reports is to provide general information to the public on pesticide active ingredients applied and sold. EPA does not collect primary data for these reports and instead relies on other sources. As previously discussed, the 2010 report will use U.S. agricultural chemical usage data from NASS and GfK Kynetec, as well as other sources for non-U.S. and nonagricultural pesticide usage data. The agency generally collects data for these reports once per year, although some sources' data are available less often. EPA first disseminated these reports in 1979. They are not disseminated every year; the most recent report was published in 2004, showing new data for pesticide usage in 2000-2001. According to EPA officials, the reports were subsequently discontinued due to resource and time constraints, but resources are now available to resume the reports, most likely on a biannual basis. The 2010 report will present new data for 2002 through 2007 and historical data for previous years. The reports are disseminated via Web download, and there is no established dissemination schedule. The reports are available for free, with no restrictions on their use. Users include academics, commodity groups, public interest organizations, news media, the federal government, and state governments. EPA identifies these users through data requests and citations in published articles, and the agency gathers feedback from data users on an ad hoc basis through e-mails and telephone calls.

Appendix III: Comments from the U.S. Department of Agriculture



United States
Department of
Agriculture

Research
Education
Economics

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of the Under
Secretary

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OCT 25 2010

Ms. Lisa Shames
Director, Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Ms. Shames:

This is in response to the draft Government Accountability Office (GAO) report on Agricultural Chemicals: USDA Could Enhance Pesticide and Fertilizer Usage Data, Improve Outreach, and Better Leverage Resources (GAO-11-37). The National Agricultural Statistics Service (NASS) appreciates the detail and professionalism exhibited by the GAO auditors throughout this review. The draft report and recommendations are insightful and will be used to further strengthen NASS and its management of the Agricultural Chemical Use Program.

For clarity, the NASS comments have been organized under each of the four recommendations in the report.

1. Establish a formal mechanism to identify and consult ACU data users on an ongoing basis to ensure ACU data continue to meet users' informational needs and to consider the effects of potential program changes on users, weighing the costs and benefits of those Changes.

The Department of Agriculture (USDA) agrees with this recommendation. NASS holds an annual data users meeting where all statistical data series are open for discussion. The ACU data will be included as an agenda item. Additionally, NASS will convene a special data users meeting during 2011 to focus specifically on the ACU data series. The invitation list to this meeting will be drawn from known ACU data users with an emphasis on individuals and entities who submitted comments to the Department during the period when the ACU program was reduced.

NASS will also conduct a comprehensive market research effort to enable it to better understand its customers/audience and their information needs. A statement of work has already been issued to seek the assistance of a qualified public affairs consulting firm to conduct this independent assessment. The research findings will be used to guide the development and implementation of a multi-year, multi-faceted, strategic communications plan that will identify strategies, tactics, practices, products, and action steps to ensure all NASS data series meet users' informational needs.

**Appendix III: Comments from the U.S.
Department of Agriculture**

Ms. Lisa Shames
Page 2

2. Strengthen outreach to state agencies regarding NASS's ability to enter into reimbursable cooperative agreements that would maximize state and federal resources, minimize costs, and enhance ACU data's usefulness to state officials.

USDA agrees with this recommendation. NASS will leverage its on-going relationship with the National Association of State Departments of Agriculture to reach outside the agriculture community into other sectors of local and State government with responsibilities for pesticide regulations and oversight. An inventory of available agricultural chemical use data collections will be made and monitored to minimize duplicative efforts. This will allow NASS to maximize use of its appropriated funds.

3. Improve user's ability to access and use ACU data on NASS's Web site by making it easier to find ACU reports, data tools, and related resources, and by updating ACU data tools on a timely basis.

USDA agrees with this recommendation. NASS is actively working to improve its on-line database, QuickStats, for the presentation of all NASS data series including the ACU data. An internal NASS team has been chartered to review data user comments aimed at improving functionality and ease of use for all data users.

4. Develop a process to systematically identify and evaluate other agricultural pesticide and fertilizer usage data sources that are publicly available on an ongoing basis to better leverage resources and reduce areas of potential overlap with ACU data collection.

USDA agrees with this recommendation. NASS Headquarters personnel with ACU responsibility will annually review known public sources of fertilizer and pesticide information for updated and expanded data items. They also will coordinate with NASS Field Office personnel to identify new data series available at local levels. These efforts will build off of the results from the USDA response to the second recommendation addressed in this response.

We appreciate the opportunity to review and provide comments on the draft report.

Sincerely,



Catherine Woteki
Under Secretary
Chief Scientist, USDA

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Lisa Shames, (202) 512-3841, or shamesl@gao.gov

Staff Acknowledgments

In addition to the individual named above, James R. Jones, Jr., Assistant Director; Laurel Ball; Josey Ballenger; Kevin S. Bray; Ronald S. Fecso; Jacqueline M. Nowicki; Alison O'Neill; Shannin O'Neill; Valerie Pfeiffer; Rebecca Shea; and Michael Silver made key contributions to this report.

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