

Agrochemicals and Security

A Training Module for the
Safe and Secure Storage of
Pesticides and Fertilizers



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Florida Cooperative Extension Service, 2005

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The Agrochemical and Security Series is available for download from the Florida Cooperative Extension's Disaster Handbook Web site <<http://disaster.ifas.ufl.edu>>. The series comprises six units:

- Why It Matters (An introduction to agrochemical security)
- Chemical Safety
- Homeland Security and Fertilizers
- Homeland Security and Pesticides
- Security and Anhydrous Ammonia
- Developing a Hazard Mitigation Plan

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About Florida AgSafe

Florida AgSafe is a program of the Florida Cooperative Extension Service that provides information and educational materials for agricultural safety and for disaster preparedness and recovery. Materials produced by Florida AgSafe are available on the Web at <www.flagsafe.ufl.edu> and at the Florida Cooperative Extension publication Web site <edis.ifas.ufl.edu>.

Our Goals

- To inform people about ways to be safe and secure, and thereby reduce the number of deaths, injuries and occupational diseases, particularly for agricultural workers and their families.
 - To build a safety infrastructure for Florida through five activities: training of workers, training of students, publications, networks, and linkages.
 - To encourage adoption of safe practices among employees and clientele. Every employee or client should be exposed to a safety tip or safety practice on a regular basis.
 - To prepare the people of Florida to face disaster of any kind, to mitigate losses, both in life and property, and to promote rapid and effective recovery.
-

Preface

For many years, producers have been aware of the health hazards of pesticides. These materials are carefully regulated, and the safety requirements for every pesticide product are spelled out in detail. Most fertilizers have been in an opposite category, considered useful, safe and inert. However, in recent years, agricultural chemicals — specifically, fertilizers — have been used in some of the most damaging terrorist attacks around the world.

These attacks have given the general public, agricultural producers and governmental authorities a new point of view. It is important for all to realize that, in the wrong hands, agricultural chemicals, including fertilizers and pesticides, could be used to do great damage.

This module provides several units which address different aspects of this problem. There are six units in this training module (with the page numbers where they can be found in this manual):

Unit 1: Introduction: Agrochemicals and Security — Why It Matters	5
Unit 2: Chemicals and Safety	15
Unit 3: Homeland Security and Fertilizers	51
Unit 4: Homeland Security and Pesticides	85
Unit 5: Security and Anhydrous Ammonia	125
Unit 6: Developing a Hazard Mitigation Plan	161

Units can be used separately or in combinations depending on audience needs. Each unit consists of:

- A narrative which gives background material;
- A PowerPoint presentation which parallels the narrative;
- Pre- and post-tests, and an evaluation; and
- Table-top exercises (selected units).

The module is structured to give the presenter plenty of flexibility. Use all six units with table-top exercises to create a day-long workshop on agricultural security, or show only one PowerPoint presentation with a question and answer period for a 20- to 30-minute training session. Reduced images of all PowerPoint slides are included with each unit and can be copied to create a participant workbook.

How to Use Pre- and Post-Tests

The idea of a “pre-post” test is that participants take the same brief quiz before and after the presentation. This gives the presenter and the participants an objective view of how much participants learned and how effective different points in the presentation were. A pre-post test takes just a few minutes before and after the presentation, but it can be a valuable tool for evaluating the presentation and reporting its impact on participants.

Unit 1: Agrochemicals and Security: Why It Matters

- Subject** Terrorist attacks of recent years have had a profound impact on Americans' view of their own vulnerability. Whether from domestic or foreign sources, this situation has important implications for all aspects of American society, including agriculture. Specifically, agricultural chemicals have been used in some of the most serious attacks.
- Goal** Inform participants about the potential misuses of agricultural chemicals and explain the need for safety and security in handling these materials.
- Objectives** As a result of this session, participants will understand that:
- Agricultural chemicals are an important part of American agriculture.
 - Agricultural chemicals can be intentionally misused to deadly effect.
 - Producers can play an important role in preventing these misuses through secure storage and handling of agricultural chemicals.
- Session Outline** Part 1: Welcome
Part 2: Introduction to Agrochemicals and Security
- Learning Environment and Aids** To conduct this training, you will need:
1. "Agrochemicals and Security: Why It Matters" PowerPoint presentation and a means to show it. (Download from the UF/IFAS Disaster Handbook Web site: <<http://disaster.ifas.ufl.edu>>.)
 2. Note paper or workbooks for participants are optional.
-

Part 1 — Welcome

SLIDE**1**

Begin by welcoming the participants and telling them the name of the workshop they are attending. Pass out any materials you have prepared for them, including an outline of the entire training session they will be participating in.

Review the learning objectives with the participants:

SLIDE**2**

- Agricultural chemicals are an important part of American agriculture.
- Agricultural chemicals can be intentionally misused to deadly effect.
- Producers can play an important role in preventing these misuses through secure storage and handling of agricultural chemicals.

Part 2 — Agrochemicals and Security: Why It Matters

SLIDE**3**

The United States has a remarkably productive agricultural sector. American producers supply more than enough to feed 300 million Americans, and they have made the United States the world's leading agricultural exporter for many years.

SLIDE**4**

The effectiveness of American agriculture is due to many factors — among the most important are two great revolutions in agricultural practice: the mechanization of agriculture beginning in the 19th century and the use of agricultural chemicals beginning in the 20th century.

SLIDE**5**

Chemicals, in the forms of fertilizers and pesticides, have given producers a powerful means of enhancing growth and defeating pests. Producers are well aware that the benefits of using chemicals must be balanced — most immediately with financial costs, but also with potential impacts on human and environmental health.

Stimulated by recent events, producers now have new concerns about agricultural chemicals.

First, agricultural chemicals have been the basis for weapons used in two of the most horrifying attacks within the United States.

SLIDE**6**

In February 1993, a van loaded with containers full of a fertilizer-diesel fuel mixture entered the underground parking garage of the World Trade Center. When the mixture was detonated, the resulting explosion killed six people and injured 1000.

SLIDES**7-8**

In the April 1995 attack on the Alfred P. Murrah Federal Office Building in Oklahoma City, Timothy McVeigh and his co-conspirators used fertilizer containing ammonium nitrate and mixed it with racing fuel to create a bomb. The massive explosion they caused killed 168 people and wounded more than 500. Half of the building itself was destroyed and had to be razed.

SLIDE**9**

Second, after the September 11, 2001 attacks, it was found that some of the perpetrators had tried to gain access to crop dusters and other light aircraft in southwest Florida. Crop dusters are designed to spray toxins, and the interest of 9/11 terrorists suggested that these aircraft might be misused to spray pesticides or other toxins or disease agents on a human or animal population. All aircraft used in agricultural operations were grounded after 9/11 until new procedures were put into place for agricultural flights.

SLIDE**10**

Third, a growing problem throughout the United States is the misuse of the fertilizing agent anhydrous ammonia.

This chemical is used in the production of the recreational drug methamphetamine (street terms: speed, crank, crystal meth). Anhydrous ammonia significantly increases the efficiency of producing the drug and therefore increases the drug dealer's profits. Theft of anhydrous ammonia is a significant law enforcement problem and creates severe health hazards both for the criminal who steals it and for the workers who may be injured when tampered equipment suddenly fails. Failure of this equipment has also caused evacuations of neighborhoods or sheltering in place when a cloud of anhydrous ammonia was released.

SLIDE**11**

The possibility of all these hazards can be reduced with proper application of security and safety programs. With better knowledge of materials, chemicals, and security protocols, we can minimize the role that the agricultural workplace might play in illegal activities. Together, we all play a vital role in protecting ourselves against these ongoing threats.

SLIDE**12**

Before we get into our main subject, let's get a little background on the subject of terrorism. We will use the following definition of terrorism (based on Title 22 of the US Code, Section 2656f(d)):

SLIDE**13**

Terrorism is the tactic of attacking civilian populations in an effort to affect the decisions of the political leadership of that population.

Terrorism might be employed by domestic groups, as in the Oklahoma City

bombing in 1995, or by foreign groups, as in the World Trade Center bombings of 1993 and 2001. Terrorist acts are often part of an ongoing conflict and so involve both elements of retribution and persuasion.

Terrorism is usually a form of what is called “asymmetric warfare.” In normal warfare, soldiers of opposing groups engage directly in battles to achieve objectives, usually the acquisition of territory and resources. However, when the power of the opposing sides are significantly different, the weaker or smaller forces may choose to attack the stronger forces through sabotage and harassment rather than in direct massed battles (guerilla warfare) or to attack the opposing force’s civilian population (terrorism).

SLIDE**14**

Two terms that the agricultural community should become familiar with are agroterrorism and bioterrorism. Agroterrorism is a special form of terrorism which targets any component of the food or water supply or the agricultural sector. Bioterrorism refers to the use of biological materials, such as disease agents, in terroristic attacks. Bioterrorism and agroterrorism could overlap if a group used a disease agent, such as brucellosis, to harm cattle.

Agroterrorism is about the target, and bioterrorism is about the means.

[Note: The three images on the slide under Bioterrorism are (left to right): *Yersinia pestis* (bubonic plague); *Bacillus anthracis* (anthrax); and *Variola major* (smallpox).]

In brief, agroterrorism is about the *target*. Bioterrorism is about the *tools*.

On the battlefield, bioterrorism is called biological warfare. A similar form of warfare is chemical warfare, in which poisons and other harmful chemicals are used.


SLIDE**15**


In this brief, introductory unit, we’ve looked at some acts of terrorism and some crimes and how agricultural chemicals can be misused. Further units in this training module will deal with these issues in much more detail, as well as measures agricultural producers and suppliers can take to minimize the chances that dangerous chemicals will fall into the wrong hands.

Keep in mind that secure storage isn’t necessarily safe, and safe storage isn’t necessarily secure. You need to understand both of these ideas.

PowerPoint Slides 1-3

Agrochemicals and Security
Why It Matters





 Agrochemicals and Security: Why It Matters Intro-01

Learning Objectives

As a result of this session, participants will understand:

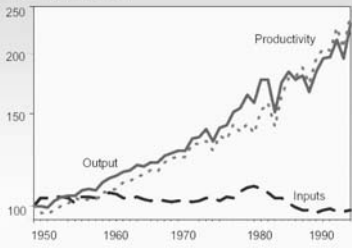
- Agricultural chemicals are an important part of American agriculture.
- Agricultural chemicals can be intentionally misused to deadly effect.
- Producers can play an important role in preventing these misuses through secure storage and handling of agricultural chemicals.




 Agrochemicals and Security: Why It Matters Intro-02

American agriculture is increasingly productive.

1948 = 100 (Log Scale)



Year	Productivity	Output	Inputs
1950	100	100	100
1960	120	115	105
1970	150	135	110
1980	180	155	115
1990	240	185	120

 Agrochemicals and Security: Why It Matters Intro-03

PowerPoint Slides 4-6


The Revolution in Agriculture

Mechanical

- 1874 Barbed wire introduced
- 1870 Silo use adopted
- 1837 First practical threshing machine
- 1834 McCormick reaper patented
- 1820 Food canning begins in U.S.
- 1910 Development of tractor begins
- 1793 Cotton gin invented
- 1884 Horse-drawn combines in use


Chemical

- Chemical fertilizers 1849
- Synthetic ammonia 1916
- Genetically modified plants 1996
- Paris Green introduced 1860
- Aroclor introduced 1929
- Hexachlorobenzene introduced 1933
- DDT insecticide introduced 1939
- Toxaphene introduced 1944
- Dioxin synthesized 1957




Agrochemicals and Security: Why It Matters Intro-04

Chemicals – Helpful and Harmful



Application of anhydrous ammonia. High nitrogen fertilizers have significantly increased the productivity of American agriculture.



Pesticides stored in corroded containers create a health and environmental hazard.

Agrochemicals and Security: Why It Matters Intro-05

World Trade Center – 2/26/1993





By Bureau of ATF 1553 Explosives Incident Report

Agrochemicals and Security: Why It Matters Intro-06

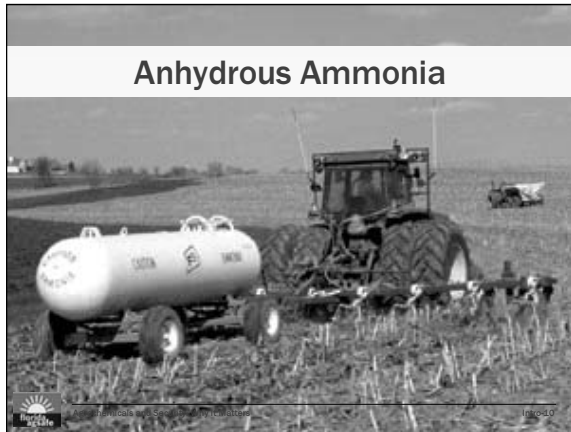
PowerPoint Slides 7-9

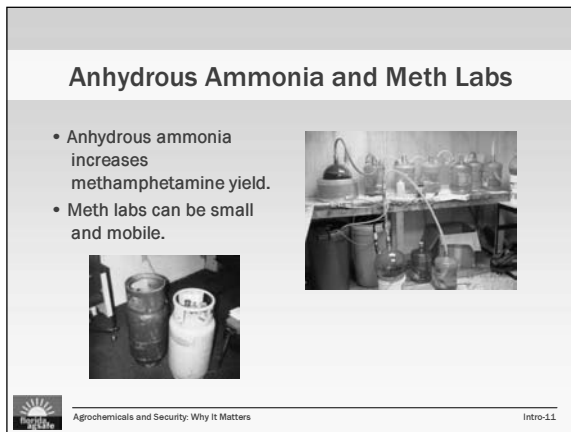


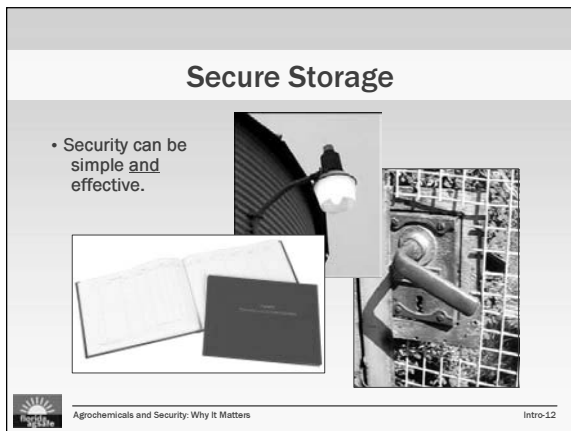




PowerPoint Slides 10-12








PowerPoint Slides 13-15

What is Terrorism?

Terrorism is the tactic of attacking civilian populations in an effort to affect the decisions of the political leadership of that population.


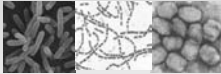
– based on USC 22, Sec. 2656f(d)




Agrochemicals and Security: Why It Matters

Intro-13

What's the difference?

Agroterrorism	Bioterrorism
	
Targets some part of the food or water supply or the agricultural sector.	Employs biological materials, especially disease agents, <i>as the tool</i>




Agrochemicals and Security: Why It Matters

Intro-14

Agrochemicals and Security

Further Topics in this Module. . .

- Unit 2: Chemicals and Safety
- Unit 3: Homeland Security and Fertilizers
- Unit 4: Homeland Security and Pesticides
- Unit 5: Security and Anhydrous Ammonia
- Unit 6: Developing a Hazard Mitigation Plan



Agrochemicals and Security: Why It Matters

Intro-15


PowerPoint Slides 16

Agrochemicals and Security: Why It Matters

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IFAS EXTENSION**

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 Agrochemicals and Security: Why It Matters Intro-16
