HURRICANE ISABEL: AN AGRICULTURAL PERSPECTIVE

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ABSTRACT

The University of Maryland College of Agriculture and Natural Resources (AGNR)-Maryland Cooperative Extension (MCE), working in cooperation with the Maryland Department of Agriculture (MDA), was intimately involved in the events surrounding Hurricane Isabel. Along with other Maryland governmental agencies, MCE and MDA were activated to 24-hour readiness on 16 September 2003 at the Maryland Emergency Management Agency (MEMA) facilities, in preparation for the hurricane's arrival. The MCE/MDA county field faculty and staff were instrumental in providing initial damage assessments from agricultural producers and the agricultural industry. They were also actively involved locally in their county emergency operations centers. The MCE developed a dedicated web page and information resource site on hurricane preparation and recovery. The MCE/MDA also participated on the MEMA Disaster Recovery state team and assisted in the planning, design, and implementation of the county-based Maryland Disaster Recovery Centers (DRCs) established throughout the state. Extension faculty and MDA staff assisted in manning 11 DRCs statewide, providing resource information on animal care, food safety, debris removal, and other storm-related topics. Although Isabel destroyed much personal property and seriously affected many businesses within the state, the agricultural community reported relatively minor effects. The hurricane was, however, the first real test of MCE/MDA's developing agricultural emergency management network and infrastructure.

INTRODUCTION

In September 2003, Hurricane Isabel caused large-scale power disruptions, flooding, and tremendous economic, psychological, and personal damage in the state of Maryland. This storm followed a devastating F4 tornado in Charles, Calvert, and Dorchester counties in April 2002. Loss of equipment and facilities, coupled with lack of insurance coverage, illustrated how unprepared most of the agricultural community was for these types of events. It also demonstrated the need for participation of the University of Maryland College of Agriculture and Natural Resources' outreach component—the Maryland Cooperative Extension (UM-AGNR-MCE) and the Maryland Department of Agriculture (MDA)—in the reporting and public education process before, during, and after emergencies.

In the past, each agency's response to a disaster was primarily reactive and was often independent of other agencies' response. During emergencies, a lack of information and disjointed communication made it difficult to assess what was actually happening in the agricultural community. No real network for information existed and few resources were made available before, during, or after an event.

MATERIALS AND METHODS

Infrastructure

The urbanization of Maryland has resulted in a disconnect between the urban and suburban communities and their rural agricultural neighbors. When emergencies occur, much of the attention and

resources immediately go to the most populated areas. Rural communities are often left to solve their own problems. Following the tornado that blew through Charles County in April 2002, calling it the "La Plata tornado" became a sore point in the community, since much of the damage to agricultural equipment, barns, fields, forests, and homes had occurred in more rural areas not publicly recognized. Only a limited system existed to report and evaluate the damage in agricultural areas through the USDA Farm Service Agency (FSA) and only limited assistance was available. County government eventually held community meetings to learn more about what was happening and MDA assigned a special evaluator to investigate and take reports. The agricultural agencies and organizations provide assistance after an incident, including assessments through the FSA, but there is duplication of effort and no comprehensive plan. Planning has been limited primarily to specific responses to serious animal diseases, insurance, and low-interest loans for crop damage.

After the tornado and the September 11, 2001 terrorist attacks in New York and Pennsylvania, UM-AGNR-MCE and MDA recognized the need to cooperate more effectively and to become more proactive in assisting the agricultural community in preparing and responding to emergencies. They began to facilitate, enhance, and coordinate their organizational infrastructures for emergency preparedness and antiterrorism, developing a series of internal emergency standard operating procedures (SOPs), and improving communication coordination and outreach capacity for emergency preparation, response, and recovery operations. Efforts included:

- Development of UM-AGNR-MCE policy and educational programming by the UM-AGNR–MCE Disaster Focus Team. This team includes members from the College of Agriculture and Natural Resources as well as the Virginia-Maryland Regional College of Veterinary Medicine (VMRCVM), University of Maryland Eastern Shore (UMES), the Institute for Applied Agriculture (IAA), and the College of Life Sciences.

- Development of UM-AGNR-MCE SOP for emergency preparedness and disaster response.
- Creation of an MDA animal health and biosecurity response team that has been reviewing the capabilities of the animal health diagnostic laboratories, especially regarding personnel and equipment needs. The program has intensified its efforts on animal surveillance, safety, and food regulatory issues.
- Revision of the MDA SOP for emergency preparedness and disaster response.

Outreach

Outreach is a major component of the missions of UM-AGNR-MCE and MDA. Each agency began to improve its capacity to disseminate information on terrorist awareness, food security, and emergency preparedness to the agricultural community and state citizens, to enable these citizens to respond proactively, appropriately, and effectively in the event of a major food security emergency, whether natural or intentional. Situation analysis and actions include:

- Determine:
  - What do we need to do? Determine programs to be developed.
  - What training is needed? For whom? Establish faculty and staff roles and develop procedures and protocols (communications, etc.). Provide training for faculty and staff.
  - What resources and equipment are needed?
- Identify available expertise and resources in:
  - Plant science
  - Animal Science
  - Extension: Agriculture; Family & Consumer Science; 4-H and Youth
- Determine expertise that needs to be developed.
- Identify and develop educational resources needed.
- Identify funding sources.

Collaboration

It became clear that effective collaborations between agricultural organizations and agencies in Maryland were critical. Efforts to foster working relationships with state and county governmental partners, the university community, and agricultural industry began to provide a seamless proactive response before, during, and after an emergency.

- Through collaborative efforts between the UM-AGNR-MCE and MDA, a joint Center for Agrosecurity and Emergency Management (the Center) is being developed to coordinate communication and education efforts in the agricultural community to ensure agricultural and food security within the state.
- The Center will capitalize on university research, including the federal Homeland Security Centers of Excellence, as well as other resources. The UM-AGNR-MCE teaching and extension activities along with MDA plant and animal surveillance and regulatory and laboratory activities place these organizations in a unique position to enhance the agricultural community's preparation, response, and recovery.
- Agricultural Local Emergency Response Teams (ALERT) made up of MDA and UM-AGNR-MCE faculty and staff in Maryland counties will be responsible for community outreach and education. They will also provide real-time reporting of the effects upon and needs of the agricultural community during an event to the Center and their local emergency operations center (EOC), as appropriate.
- The Center will significantly augment its capabilities through linkages to both government and the agricultural industry. Strong relationships will be maintained with many agencies and organizations including:
  - USDA Farm Service Agency (FSA)
  - Maryland Department of the Environment (MDE)
  - USDA Natural Resources Conservation Service (NRCS)
  - Maryland Emergency Management Agency (MEMA)
  - Maryland Fire and Rescue Institute (MFRI)
  - University of Maryland, Eastern Shore
  - Maryland Department of Business and Economic Development (DBED)
  - Virginia Maryland Regional College of Veterinary Medicine (VMRCVM)
  - Maryland Department of Health and Mental Hygiene (DHMH)
  - Maryland Department of Natural Resources (DNR)
  - Maryland Farm Bureau
  - Maryland Association of Soil Conservation Districts (MASCD)
  - Forum for Rural Maryland
  - Maryland county governments
- Participation will be renewed by both UM-AGNR-MCE and MDA in MEMA-sponsored exercises and events.

RESULTS

Hurricane Isabel provided the first real test of UM-AGNR-MCE and MDA's developing processes to assist the agricultural community in responding to and recovering from emergencies in a coordinated fashion, and reporting agricultural damage and issues within the emergency management community.

On Tuesday, 16 September 2003, MDA and UM-AGNR-MCE were activated to 24-hour readiness at MEMA facilities in anticipation of Hurricane Isabel. The UM-AGNR-MCE and MDA worked with MEMA and FEMA personnel to monitor Isabel's northeasterly path and arrival in Maryland. This presence allowed information sharing and updates on agricultural issues throughout the emergency management system.

County field faculty and staff from MDA and UM-AGNR-MCE were instrumental in providing an initial damage inventory of agricultural producers and industry, and assisted the USDA Farm Service Agency in assessing agricultural damage after the hurricane. The UM-AGNR-MCE provided educational resource assistance prior to,

during, and after the hurricane. County field faculty were actively involved locally in their county emergency operations centers (EOCs) and were invited to be a part of the hurricane performance response.

The UM-AGNR-MCE developed a dedicated web page and information resource site via the UM-AGNR-MCE website that focused on hurricane preparation and recovery. This site highlighted UM-AGNR-MCE specialists' areas of expertise and included disaster preparedness and recovery articles and fact sheets, and provided timely links to other universities, governmental resources, and EDEN (Extension Disaster Education Network). Also, an "expert" list of university specialists from the College of Agriculture and Natural Resources was developed for use by the media to locate useful and credible information.

The MDA responded to assistance needs by funding requests for best management practices (BMPs), including repairs to fences and lagoons as well as other animal and crop practices, through the county Soil Conservation Districts (SCDs). The state chemist's laboratory at MDA provided feed testing and analysis of agricultural animal and pet feed. The MDA's five animal health diagnostics laboratories, located in each region of the state, provided animal disease diagnostics services.

In most years, late September is the end of surveillance and adult mosquito spray operations for MDA's mosquito control program. However, floodwaters from the hurricane increased late-season breeding potential. Mosquito control staff initiated adult mosquito control in areas affected by the hurricane. Insecticides to control adult mosquitoes were applied by air and from trucks and other ground equipment to 98,566 acres between 22 September and 6 October 2003.

The State Emergency Management Operations Center requested that MDA and UM-AGNR-MCE participate as members of the MEMA disaster recovery state team. This team assisted in the planning, design, and implementation of the county-based Maryland Disaster Recovery Centers (DRCs) established throughout the state. MDA and UM-AGNR-MCE personnel staffed 11 DRCs statewide, providing resource information on animal care, food and drinking water safety, debris removal, and other storm-related topics. In addition, a field resource notebook was created for all recovery centers, containing information on agricultural assistance and contact persons, as well as fact sheets on appropriate topics. Individual county faculty and staff developed county-specific exhibits, flyers, and other resource materials for their county-based DRC. The UM-AGNR-MCE Home and Garden Information Center's toll-free telephone line fielded more than 200 storm-related calls before, during, and after the hurricane. Callers requested information on controlling mold and mildew, handling floating oil tanks, handling oil pollution of the soil, removing tree debris, and dealing with the effects of submersion on lawns.

Agricultural Impacts from Hurricane Isabel

Although Isabel destroyed a great deal of personal property and seriously affected many businesses within the state, the agricultural community reported relatively minor effects. Much damage was probably left unreported, however, as UM-AGNR-MCE and MDA recognized that the agricultural agencies did not have the capacity to do an effective, real-time survey. Most of the information is anecdotal. In addition, the agricultural community tends to view most storm damage to their property (such as trees down) as minor due to an attitude of self-reliance, which complicates reporting.

There were no reported serious effects from the storm on livestock. Minor damage occurred to livestock buildings, outbuildings, and sheds, disrupting feed cycles and production schedules. However, these schedules were re-established within a reasonable amount of time. One Frederick County dairy farmer reported to the USDA Farm Service Agency that he lost a hay barn and a dairy barn during the storm.

The USDA FSA estimated state crop losses at 15–30% of the field corn and 10–15% of the soybean crop. Sections of the corn crop were blown down by high storm winds. This type of damage makes harvest difficult. Soybeans suffered damage

from windblown plants and saltwater saturation. Mid-September was a critical time in soybean development and the storm damage had a direct effect on the quality at harvest—and subsequently on yields and crop prices. Some Eastern Shore counties also reported debris damage to the soybean crop.

Multiple incidences of trees downed on cropland edges and within forests on agricultural property were reported, requiring cleanup and affecting timber values. Reports also came in of some perishable fruits and vegetables lost due to power outages in cold-storage facilities.

In Kent County, two aquaculture production ponds were overwhelmed with the increased water inflows from Isabel. Most of Maryland's seafood processing facilities lost 1 to 2 weeks of production in addition to plant damage.

When the stormwaters finally receded, many crab processing plants and crab house restaurants were closed due to flooding. Watermen suffered at least 2 weeks of unemployment; many had to pull their pots and nets and reposition them after the storm. The shellfish harvest was closed until 29 September because post-storm water quality in the Bay made the shellfish unsafe to consume. The MDA specialists consulted with these operators to assess damage costs and other recovery issues.

DISCUSSION

Further development and funding of the Center for Agrosecurity and Emergency Management and its ALERT network is a priority to enable UM-AGNR-MCE and MDA to respond in emergencies. The Center will work on the federal ESF-11 (Food and Food Security) issues that integrate the missions of homeland security—as well as education and training—into the rural community.

The experience with Hurricane Isabel illustrated the challenges of communicating with personnel in 23 counties, especially when utilities are down in a substantial portion of the state. It also demonstrated the need to further engage personnel in the network and its mission, as well

as provide adequate training to empower them. In the past, members were not been expected to provide emergency status reports beyond the local level, and so are learning a new role. ALERT members will receive emergency management training following a train-the-trainer model and agrosecurity exercises will be instituted. Members will be equipped with disaster kits and communication equipment that allow a proactive approach to county emergencies. Both agencies will enhance communications equipment and resources to ensure and provide local and statewide communication capabilities when the need arises. Response team individuals will be equipped with the appropriate phones, computers, e-mail devices, and other communications equipment along with the resource numbers and contact information needed to provide timely interagency communication for threat identification and diagnostics procedures. A more efficient use of Global Information Systems (GIS) networking will be investigated and enhanced by the agencies, allowing more direct and accurate information gathering and effective response to an emergency event.

Outreach activities will provide educational programs for Maryland citizens that will enable them to protect the food supply (animal and plant) and public health, including an updated website that will link to educational information and resources, a series of Maryland-specific agrosecurity tip sheets, agricultural industry education programs, citizen workshops and demonstrations, and other activities that focus on food security issues and awareness. Following the hurricane, ALERT members identified the need for readily available educational materials on specific topics for members of the network. As a result, tip sheets were produced on "Water Purification for Commercial Food Processing Facilities," "Repairing Storm Damaged Trees," and "Petroleum Storage Tanks on the Farm."

Collaborations will be expanded to include practicing veterinarians and other stakeholders. The Center and ALERT will integrate with the Maryland Department of Health and Mental Hygiene

(DHMH) public health response teams to provide more interagency training and outreach.

Working in conjunction with MEMA and other state and national agencies, the Center will assist in the cross-section coordination and/or facilitation of communication, information distribution, and training for Maryland citizens. For UM-AGNR-MCE and MDA, the Center will provide harmonized leadership for local educational programs on agrosecurity and educational materials directed at internal, private, and public audiences, allowing these agencies to better assist the agricultural community in preparation, response, and recovery from disasters.

Although agricultural entities in other states have had to work together when disasters occurred, no permanent networks of collaboration had formed. It is hoped that the Center and ALERT network, working with other agricultural organizations and the emergency management community in Maryland, will serve as a model to other states. Efforts have begun to expand this network concept into the Mid-Atlantic states and discussions are being held with Delaware to start the process. The UM-AGNR-MCE has also joined the EDEN—a national association of university professionals from throughout the country working in emergency management education programs. All Center forms, reports, and literature will be shared with other participating EDEN states to advance the nationwide system of preparedness and response by educational institutions and their partners.