

Keeping North Carolina's Farms and Forests Vibrant and Resilient through Adaptive Management: Priorities and Recommendations for Advancing Adaptive Management

From the time the very first seeds were planted in the ground and meat and dairy animals were first domesticated, producers have historically and consistently modified practices to meet the many challenges of variable and extreme weather events. The history of North Carolina agriculture and forestry is also a tale of adaptation and remarkable progress in the face of these challenges.

Recent years have demonstrated just how vulnerable production systems are to changing weather and damaging weather. Hurricane Floyd in 1999 still remains the single greatest disaster in North Carolina's history. An extended dry period from 1998-2000 was followed by a historic drought in 2007, when all of North Carolina's 100 counties experienced moderate to exceptional drought conditions that cost hundreds of millions of dollars. Tropical systems have now adversely impacted North Carolina in back-to-back years just as the row crop harvest was hitting its stride. The historic floods have also dealt blows to the livestock and forestry sectors and everyone is impacted when key components of the state transportation network are disabled. Estimated total agricultural losses resulting from Hurricane Matthew exceed \$544 million from designated "disaster counties". That includes \$418.6 million in crop losses and the remainder in farm buildings, farm roads, fencing, conservation practices, equipment, vehicles, feed, etc. Twenty-eight North Carolinians died as a result of the hurricane. Wildfires in western North Carolina driven by late summer 2016 drought conditions burned over 70,000 acres of public and private forest lands and caused thousands to be evacuated. Forty-seven counties were included in a State of Emergency designation due to wildfires. Damages from these fires were estimated in the tens of millions and the costs incurred by federal, state and local entities to control these fires exceeded \$55 million.

The history of agriculture and forestry is one of constant change and continuous improvement. No one can precisely state what climate and weather patterns North Carolina will face in the future. Scientific research and producer experience do point to growing challenges – some say unprecedented challenges – for our agriculture and forestry sectors, as shifts in weather patterns continue and weather events intensify. For this reason, adaptation has increasingly become a focus of interest. This focus opens the door to the collection of solutions for addressing production challenges. Solutions which increase an operation's resilience to climate challenges can also create economic and ecological added-value for landowners and society. Practices such as prescribed fire in forests, terrestrial carbon sequestration through cover crops, methane capture and conversion and retention of rain water, among others, can improve soil health, water quality, wildlife habitat and other natural, societal, financial and operational benefits.

Adaptation represents a powerful tool in addressing many of the uncertainties facing producers, value chain partners and supporting entities. Adaptation strategies come in many different forms, ranging from minor adjustments designed to protect the existing production system to major changes in production and marketing practices.

With good planning and through proactive management, North Carolina's agriculture and forestry producers can remain productive and provide many benefits beyond food and fiber. North Carolina's farmers, foresters and livestock producers will have to adjust to more variable weather and extremes by merging new knowledge, experience, planning and practices with new technologies and decision-making

tools. However, they also will need focused support to innovate and adapt to the changes ahead in a way that strengthens production systems, improves profits and reduces environmental impacts. The state's leadership should support North Carolina's producers by making investments in public research, and expanding the state's economic development focus on agriculture and forestry.

The North Carolina Agriculture and Forestry Adaptation Work Group created four (4) stakeholder Teams – Commodity Crops; Livestock; Forestry; and Specialty Crops. Each Team established their own process to identify adaptation recommendations, priorities and strategies. However, several common themes and cross-cutting recommendations were observed. They include:

- All production sectors indicate that research on water management, in particular irrigation methods, technology and/or feasibility is important going forward.
- Drought resistant cultivars and adaptive cover cropping systems for improved soil and nutrient management are needed for production and practice systems across all production platforms (i.e. specialty crops, commodity crops, etc.).
- Agriculture and forestry each identify a desire for a “Risk Management Collaborative” to collect and share information on policies and programs, and that will help steer adjustments in programs that reflect changing conditions.
- Each sector also identify access to new markets as a risk management option for creating product demand and increasing revenues.
- It is important that localized decision-making tools and technical assistance be tailored to each of North Carolina's recognized geographical regions: Coastal, Piedmont and Mountain.
- Information is key in managing farms and forests, and producers wish to have continuing faith in Cooperative Extension Service personnel to provide timely and accurate precision agriculture information, utilization support and technical knowledge.
- The best technologies, research findings, programs and planning tools to implement adaptation strategies must find its way to producers. If producers are not involved in the development and delivery of adaptation strategies, the success rate of the adaptation strategies will drop.
- Agriculture and forestry stakeholders recommended that outreach be expanded, knowledge sharing networks created, adaption education enhanced and increased promotion of programs.

Leaders from the Tar Heel State's commodity crop, livestock, forestry and specialty crop sectors developed sector-specific recommendations for adaptive management practices, policies and programs. The individual reports can be reviewed at *Keeping North Carolina's Farms and Forests Vibrant and Resilient through Adaptive Management*:

[*Priorities and Recommendations for Advancing Adaptive Management for Commodity Crop Producers*](#)

[*Priorities and Recommendations for Advancing Adaptive Management in Specialty Crop Agriculture*](#)

[*Priorities and Recommendations for Advancing Adaptive Management in the Livestock Sector*](#)

[*Priorities and Recommendations for Advancing Adaptive Management on Forest Lands*](#)

The recommendations mark the beginning of new conversations around resiliency and adaptive management. It is important that agriculture and forestry thought leaders be committed to serving as discussion facilitators and adaptation mentors and integrate climate-smart production concepts that improve resilience and mitigate future risks from changing weather and extreme weather events.