The priorities listed below represent the most recent priorities developed by the Research and Extension Committee of the NC Ag Foundation Board and 5 additional priorities from Dean Fox.

All priorities listed below will be used to evaluate submitted proposals.

Dean's Priority projects:
- Decision support systems with potential application to multiple crops and forages for data-driven decision making
- Use of artificial intelligence (AI), machine learning, and/or data analytics in animal agriculture operations incorporating sensors and/or real-time monitoring
- Use of automation and robotics to reduce agricultural labor costs
- Research-based communications on modern livestock and poultry production that proactively combats mis/dis-information
- Use of agricultural lands and/or improvements to agricultural water structures for water storage and flood protection

Priorities set April 2024
- Impact of delays in supply chain on agriculture – tractor parts, ingredients, moving product, etc.
- Continued research M. Enterolobii in sweetpotato and other impacted crops
- Alternative products from crops currently grown in the state (i.e. small grains – what could the straw/biomass be used for?) New market development and new food crops
- Insect control in brassica crops (cabbage, collards, broccoli, etc.)
- Regenerative agriculture including forage management and production.
- Asian longhorn tick and theileria (disease they carry). How to combat, prevent, and treat.
- "Biochar" production and the impacts it could have on farming and in sequestering carbon.
- Compost tea and utilization/benefits.
- Hemp: research focused on fiber and grain production, variety tests, evaluations as an animal feed ingredient, and other uses/product development.
- Impacts of COVID-19 on consumer trends and population. Impact of rural development and population growth on agriculture and rural communities.
- Re-evaluation nematode thresholds, especially on cucurbits.
- Investigation of a redesign of subsoil rippers. Could they be narrowed and require less HP to pull through field?
- New tobacco varieties with resistance to diseases, including leaf diseases.
- How can farmers use AI and big data information already generated for better farm management. (Leveraging resources from PSI, Crop Science, Animal Science, BAE, and ARE departments).
- General need for more research and extension on brassicas and lettuces.
- Less expensive sources of internet access to farmers to implement new technologies
- How do we develop data promote health benefits of the two purple sweetpotato varieties (they are gaining popularity due to documentaries on health benefits)
- Develop AI technology to detect and identify nematode species.
- Research on the relationship between foliar diseases and increased mycotoxin levels in dairy forages
- Evaluation of wildlife deterrents across multiple crops There is need for efficacy evaluation and documentation of impacts to specialty crops (expand beyond soybeans)

- Manage of wild bird populations in operations in relationship to HPAI.
- More research on efficient labor usage and evaluation of robotics and AI to reduce farm labor inputs.
- Research on access to energy on-farm, specifically access to 3 phase power and conversion from single phase to 3 phase.
- Development of rapid HPAI test in addition to a manure PCR.
- Research to map endangered species in NC relative to the Endangered Species Act which may impact pesticide registrations.

Priorities from 2022-2023

- Combat higher input costs across the board – pesticides, herbicides, fertilizers, etc. Also evaluate livestock/poultry production with challenges in ingredient availability/costs with feed formulations.
- How limited crop protectants (and export bans) for all crops/cropping systems can impact management strategy. Continue to lose chemistries through EPA review/export markets (large impact to sweetpotatoes and peanuts – some markets very tight on what they allow; need to continue to monitor).
- Supply chain impacts to all of agriculture – tractor parts; ingredients; moving product; etc.
- Enterprise budgets – especially with rising input costs and labor. Need to make sure updated and as accurate as possible.
- Regenerative agriculture, including evaluating forage management and production.
- Biochar production – facility setting up in Richmond County – impacts it could have on farming and in sequestering carbon.
- Compost tea and utilization/benefits
- Carbon market outreach/education efforts – economic feasibility, etc.
- (new) Currently there is an oversupply of old crop sweetpotato inventory being disposed of because of EU market situation. Could Ag Engineering program do/has done study on bioenergy/biogas production utilizing sweetpotatoes and other farm waste products (tobacco, other produce). Have seen biogas energy production facilities at packing houses in the EU. Tax incentives for renewable energy – Duke Energy required to receive percentage of their energy from renewable sources. Opportunities on certain farms across the state to develop biogas/renewable energy production.
- Pesticide/herbicide carryover in drought conditions that would impact production.
- Hemp: research focused on fiber and grain production; varietal tests; evaluations as an animal feed ingredient; other uses/product development.
- Alternative products from crops currently grown in the state (i.e. small grains – what could the straw/biomass be used for? What markets could be developed? Additional food products that could be developed?)
- Evaluate additional chemicals for use on tobacco – niche crop; challenges and limited labeling. (disease resistance/fungicides/etc.) Noted Granville Wilt resistance in tobacco – new varieties needed including those with increased resistance.
- In general, fungicide resistance is becoming an issue in many crops and is impacting some crops more than others. Need labels for products that control frogeye leaf spot in tobacco (Quadris

resistance emerging?) as it has become an annual issue in some areas of the state. Produce crops like strawberries are also impacted by this resistance so more research on new modes of action for fungicides across many crops is needed.

- Continued need for extension pathologist to do work to address issues in major NC crops. Missing specialists to work on Row Crops (update: New Dept. Head will be filling 2 positions.)
- Enterolobii in sweetpotatoes, continued research and priority for sweetpotato projects (funding has been received, but still priority area.)
- Insect control in brassica crops (cabbage, collards, broccoli, etc.)
- More research on soil insects in sweetpotatoes.
- Precision ag data management, integration and how it impacts decision-making on the farm. Whole-systems approach to match crop, animal and production needs. Tremendous amount of data generated, but limited interpretation for best utilization. Include more research on digital ag (i.e. drones) on imaging, cost-efficiency, disease, nutrient, insect management, etc. for all crops and cropping systems.
- Evaluate alternative feed ingredients for animal/poultry production. Example of peanut meal being brought in from other states. Are there ways to increase use of NC products for animal feeds? Current project in Prestige Poultry Science Dept. Need consistency of nutrient values (some ingredients may result in color change to final product). Some ingredients also have rejection thresholds from animals; flowability and texture also important for feed manufacturing. Also need consistent nutrient value. Hemp press cake also being studied. Emerging need to evaluate impacts if there is a rail strike/other supply chain impacts on animal feed.
- Cochlosoma (turkey) – basic understanding of organism, hosts, control, etc.; e-coli control in 6-12 week-old turkeys (devastating to industry; costs several $million/year. Zero interventions available and many treatment options have been removed. Have learned, but not moved forward with isolation. May be close to genome mapping (Ceva ~ vaccine company).
- (new) Asian longhorn tick and Theileria (disease they carry). Need to keep an eye on; work with Vet School and Animal Science Dept. Combat, prevent and treat.
- (new) Broadband/COVID areas should be supported, but not necessarily to be funded by Ag Foundation.
- Dairy youth programs could be improved with additional dairy foundation funding as well as faculty and county extension engagement. Projects could include 4-H dairy youth engagement or dairy judging program development.
- Farm-to-processor milk transport continues to be an increasingly expensive issue. Possible projects could include small farm economics of additional on-farm storage. Answering questions of bulk tank microbiology over the 72 hour hold time and the issues regarding cooling and agitation could be helpful for farm and co-op.
- Novel farm automation is becoming an important future investment for farmers. Projects that could look at the economics of farm automation, specifically technologies that would help smaller family farms with labor, production, and milk quality.
- Utilization of land in Eastern NC brings possible synergies with non-dairy animal agriculture systems. Projects could include forage production and waste streams for animal feed such as peanut hulls or sweet potato peels. Also, projects could assess the economic viability of locating dairy and beef animals adjacent to poultry or swine operations.

- Dairy animal bedding plays an important role in animal health and milk quality. The current use of sand bedding and reuse of this material has impacts on the microbiology of milk. It's not currently known how specific bedding practices affect the microbiology of the raw milk, projects could include testing and analysis of bedding and milk to obtain a better understanding of milk quality.