NH Envirothon 2019 Current Issue

Technology to Support New Hampshire Agricultural Communities

Introduction

Land managers and farmers alike are constantly challenged to increase crop yields and cut costs while reducing environmental pollution. To accomplish these goals, many are looking for new technologies to help them decide when and where to irrigate, fertilize, seed crops, maintain livestock, and use herbicides and pesticides. Ground-based sensors, livestock biometrics, aerial imaging, and machine-based sensors are among new technologies boosting agricultural efficiency. For example, using data collected by satellites, important agricultural factors like plant health, plant cover and soil moisture can be monitored from space, providing a much bigger picture of the land surface that can be combined with other technologies to help cut costs and increase crop yields.

Agriculture technologies are helping to decrease some of the social and environmental *externalities* associated with industrial-scale food production such as water and air pollution, and the social and economic degradation of rural areas. Advances in sensing technology and robotics are changing the business model of farming and helping small farms to become more competitive, thereby boosting the economic viability of rural areas. In addition, technology has decreased indiscriminate distribution of pesticides and herbicides through the monitoring of soil and crop properties.

While there are many technologies available to farmers, some can be expensive and implementation complex. Farmers need to make informed decisions on which technologies to implement based on costs, benefits, complexity, and how well the technology can be integrated into their system. There are also social influences such as education level and the level of contact with extension services that impact the ease and willingness for farmers to adopt new techniques and technologies.

The Challenge

Your team has been charged with preparing a presentation on current agriculture technologies that improve efficiency, lead to more profits, and produce less pollution. Your presentation should explain how the use of technology can benefit the greater community, as well as the farmers' customers.

Some questions to help guide your research:

How do agriculture technologies help to reduce pollution?

What are the main costs and benefits associated with implementing certain agriculture technologies?

How can social and environmental externalities be included in cost benefit analysis?

What skills and/or technical support will farmers and land managers need to implement certain technologies?

Your presentation should include a method to distribute knowledge about agriculture technologies to local farmers and land managers.

Resources

New Hampshire Department of Agriculture

http://agriculture.nh.gov/index.htm

New Hampshire Association of Conservation Districts

http://www.nhacd.net/

University of New Hampshire Cooperative Extension

https://extension.unh.edu/topics/agriculture-horticulture

New Hampshire Farm Bureau (Local Farmer contact resource)

https://www.nhfarmbureau.org/contact-us/

New Hampshire Food Alliance

http://www.nhfoodalliance.com/

USDA Natural Resource Conservation Service

https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/

https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health/

Farm Industry News

https://www.farmindustrynews.com/precision-farming/z-technology-changing-agriculture

SuccessfulFarming

https://www.agriculture.com/technology?page=1

Agrotechnology (international journal articles)

https://www.omicsonline.org/agrotechnology.php

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