A Regional Matrix Tool for Cover Crop Selection and Guidance for Farmers in the Midwest

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Introduction

Cover crops provide a variety of ecosystem services including erosion protection, soil building, nitrogen sourcing and scavenging, and weed, disease, and pest management. The range of cover crop choices includes grasses, brassicas, and legumes. While cereal rye dominates cover crop establishment, other cover crops are increasingly under consideration to provide specific environmental and agronomic services to cropping systems. Considerable plot- and field-scale research has been performed for numerous cash/cover crop combinations; however farmer access to performance and application information relevant to the Midwest region is limited. To provide farmers guidance for cover crop selection, a matrix tool is being developed for the crop management zones of the Midwest region.

Widespread cover crop adoption and usage by farmers has been hampered in the Great Lakes and Upper Mississippi River basins, in part, due to the lack of knowledge of cover crop alternatives, understanding of cover crop agronomic and environmental functions, insight into economic and agronomic risks, and accessibility to specific cover crop application information. Considerable local information has been generated by universities, agricultural organizations, and farmers throughout the region on cover crop performance and application, however this information resides within multiple organizations and systems, varies in form and format, is often difficult to locate, and does not lend itself to making cover crop decisions. A system is required that consolidates local information within the region, provides a common format, implements a regional database, and supports farmer cover crop decision-making.

Background

This project is a collaborative effort of the Midwest Cover Crops Council (MCCC). The MCCC seeks to significantly increase the amount of continuous living cover on the Upper Midwest agricultural landscape. From cities to the countryside, this transition in landscape design will produce numerous ecological benefits, including improvements in water, air, and soil quality. As the public grows increasingly aware of our collective ecological footprint and its relationship to climate change and water quality, the effort to add living cover to our landscape can generate new sources of renewable energy, mitigate greenhouse gases, reduce the use of agricultural chemicals, and provide novel income streams for rural communities. In an era where the Mississippi River Basin and Great Lakes Watershed suffer from serious environmental degradation, this shift in agricultural systems can play a significant and positive role in revitalizing and restoring our lakes, rivers, fields, and communities. The MCCC seeks to achieve their aim of broad adoption of cover crops by farmers, by building a vital and effective regional collaboration of agencies, individuals and the general public.

The MCCC is a diverse group from academia, production agriculture, non-governmental organizations, commodity interests, private sector, and federal and state agencies with members from Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, Ohio, Ontario, and Wisconsin. Additional information about the MCCC and cover crops in the Midwest can be found at their Web site, www.mccc.msu.edu. Since its inaugural summit in 2006, the MCCC has been

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committed to developing a tool to support cover crop decision-making, termed the **Regional Matrix Tool**, reflecting the grid or matrix structure of the information. The SAN/SARE handbook titled, *Managing Cover Crops Profitably*, by Andy Clark, which details cover crops and their application broadly at the national scale, was selected as the basis for the tool development. The regional matrix tool is patterned after the cover crop characteristics charts in *Managing Cover Crops Profitably* detailing: (1) performance and roles, (2) cultural traits, (3) planting, and (4) potential advantages and disadvantages. The information will be more detailed and specific for the Midwest region and sub-regions including adding more cover crop choices, including varieties when known to be different, and considering additional roles or traits of cover crops. The regional matrix tool project will compile existing information and research results from the region gleaned from experts in each state as well as published research and extension articles. The matrix tool will be made available in a published version and on the Web in a form easy to use for farmers as well as NRCS and other conservation or farm advisors.

Development process

Regional collaboration

At the Third Annual Midwest Cover Crops Council Workshop/Meeting regional cover crop representatives and experts were engaged in providing input on the tool design and cover crop species, information, and parameters to be included. Participants working in groups reviewed, modified, and consolidated the information represented in the charts from *Managing Cover Crops Profitably*. Fifty cover crop species and 70 categories were identified that represent cover crop use in the Midwest. Participants identified cover crop experts to be involved in the development as contributors and reviewers. A subcommittee was formed to further refine the input and finalize the matrix design. The subcommittee completed the matrix design in the summer of 2008.

MCCC regional matrix tool work groups

Local collaboration

Meetings are being held with stakeholders from each state/province within the region to review the subcommittee matrix final design recommendation and identify cover crop information sources, contributors, and a local development team. The local teams will be responsible for reviewing and validating local information and recommendations for cover crop application within their state/province.

Tool development

A published and Web-based tool is being developed to assist farmers in identifying species and production systems appropriate for their locations that meet their goals for using cover crops. Cover crop selections will suggested that are appropriate within their crop rotation systems and that minimize or identify the agronomic and economic risks associated with their use.

The regional matrix tool is being funded in part by a Conservation Innovation Grant through the Conservation Technology Innovation Center entitled *Using Cover Crops to Facilitate the Transition to Continuous No Till* in Indiana and Ohio. A prototype of the system is being developed for Ohio and Indiana that will be tested with agricultural consultants and farmers in 2009 as part of that project. Information from the other states/province will be follow.

Support

Interested parties are encouraged to get involved with the MCCC and provide support to the regional matrix tool project. A listserv has been established to provide information and updates on the activities of the MCCC. It can be subscribed to at http://list.msu.edu/cgi-bin/wa?SUBED1=mccc&A=1.

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