

MAP BASED WWW TOOL FOR RECOMMENDING FORAGE SPECIESM.H. HALL¹, D.A. MILLER¹ and J.H. CHERNEY²¹Department of Agronomy, Pennsylvania State University, University Park, PA 16902, USA.² Department of Crop Science, Cornell University, Ithaca, NY 14853, USA.**Abstract**

Selecting the “best” forage species or species mixture requires a knowledge and understanding of the consuming animal, soil characteristics, and forage species. The multivariate nature of the problem presents challenges to those interested in solving the practical problem of maximizing available resources. Earlier work at Cornell University resulted in a WWW-based interface that allowed the user to provide a soil type or zip code and additional management factors to initiate the species selection. This approach relies on either user knowledge of soil series or an implied relationship between zip code and soil series that may often be wrong. To improve this management tool, we have developed a working WWW-based map interface that allows the user to move to near field-scale where a “click” will link the map location to underlying soil series information (series id, drainage and slope classes). This information is then passed to the decision support component of the system where the species selection process occurs. This map-based approach takes advantage of the inherent spatial nature of the forage selection problem

Keywords: Forage, world-wide web, management aid, geographic information system

Introduction

Selecting the “best” forage species or species mixture requires a knowledge and understanding of the consuming animal, soil characteristics, and forage species. Unfortunately, not all persons making forage species recommendations are versed in these areas. To assist in merging these three areas of understanding, educators at Cornell University developed a WWW-based interface that selected forage species based on potential yield after soliciting soil and intended use information (Cherney et al., 1998). Later, a prototype map-based interface was added to the Cornell program (Hall et al., 1999). Continued development of this map-based WWW tool for greater geographic regions is ongoing and will be presented.

Materials and Methods

We developed a working WWW-based mapping application using Common Gateway Interface (CGI) scripts written in Perl (The Practical Extraction and Report Language). The main map interface is a shaded relief map of the United States that allows successive "zooms" enabling the user to move to successively more specific regions of interest. At the desired county level, the user is able to click on an area of interest and is then moved to a coverage of black and white digital orthophotos of the land surface. Successive levels of zoom at this point then allow the user to select a specific farm field where a “click” will link to underlying soil series information (series id, drainage and slope classes).

While this is not Geographic Information System (GIS) over the web, it does use GIS software to pre-process and register digital orthophotographs of the land surface and digital soil survey information. The digital soil survey information consists of map unit polygons whose identifiers are linked to the decision support database.

Once the field for the intended forage seeding is selected from the WWW map, the corresponding soil series information is passed to the decision support component of the system where the species selection process occurs. Yield estimates were derived from USDA-SCS Soil Survey yield estimates for each possible forage species and soil series combination using measured forage yields as the adjustment factor. The user inputs the forage use information (e.g. silage, dairy) and the program identifies species from a matrix that meet the “use” criterion. If the species that are identified as acceptable for the “use” criterion also meet or exceed the “yield-cutoff” criterion then they are presented as “recommended species”.

Results and Discussion

The prototype has been screened and tested by focus groups of county extension agents, private consultants and producers. Modifications have been implemented but the initial response and receptiveness towards the program has been high. This map-based tool for selecting forage species is currently available for only a small geographic area. However, the growing availability of digital orthophotos of the land surface and digital soil survey information for the conterminous United States and other areas of the world will make implementation of this concept realizable for a large proportion of forage producing regions within 10 years. Extension agents, consultants and individual forage producers can use this tool to bridge their understanding of the forage species with the underlying management units of the landscape.

References

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