

Environmental Credits Trading

How do we estimate benefits for individual farmers or enterprise?

Background

Growers living in rural areas and residents of urban areas are increasingly interested in establishing a system for environmental credits trading. Carbon trading systems are already in place, yet, no standard mechanism is available to quantify environmental benefits of management practices at the individual farm or watershed level. Furthermore, evaluating this impact is not easily nor cost-effectively accomplished by experimentation or direct observation.

The use of computer simulation models is a valid approach to address issues such as carbon sequestration in agriculture. With increasing acceptance of simulation models due to a greater degree of confidence in their capabilities and accuracy, usage is becoming well established. The simulation models developed at Blackland Research Center are suitable for a wide variety of environmental assessments.

C-FARM is a simple, robust model, designed to help growers compute and trade carbon credits. It has a simplified crop growth, soil water balance and cropping system module, coupled with a unique soil carbon module that allows computing annual rates of carbon sequestration based on information from the grower. It is being utilized to compute carbon sequestration rates under no-till in the Pacific Northwest. The structure and interface are simple and attractive for growers, consultants or government agencies such as NRCS.

EPIC is a comprehensive cropping systems simulation model. In addition to soil carbon, EPIC provides information on the quality of water leaving the systems via percolation, runoff or lateral flow. It requires site-specific inputs for which databases are available for Texas and the United States.

APEX is a simulation model that shares many components with EPIC and allows assessments in small watersheds. APEX is useful for small area assessment of environmental credits. Soil and water scientists with expertise in simulation models find the capabilities of the model useful in comparing large numbers of scenarios. Scientists at the Blackland Research and Extension Center are in the process of developing a user-friendly interface that will facilitate and spread the use of this powerful tool for agronomic and environmental assessments.

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