An Intermodal Delivery System for Agricultural
Marketing and Weather Data

by

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Abstract

A project entitled "Green Thumb" has been initiated in Kentucky
to provide farmers real time weather and marketing data. This project
represents a major departure from past dissemination systems in that
it provides for rapid, continuous transmission of data directly to
farmers' homes, utilizing computers, telephones, and television to access
and deliver data.

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An Intermodal Delivery System for Agricultural
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A project entitled "Green Thumb" has been initiated at the
University of Kentucky to provide farmers real time weather, marketing,
and agricultural data. The project will test the feasibility of
operating a computerized system for the delivery of data on a continuous
basis to farmers' homes. Market and weather information are critical
ingredients in the success of a farming operation. Producers have been
demanding additional types of data as well as more frequent reports and
updates.

The following discussion outlines Kentucky's feasibility test
for developing an information delivery system for farmers. Specifically,
this paper; (1) outlines the mechanics for delivering timely market and
weather information to farmers, (2) describes the information to be
provided, (3) compares the Green Thumb concept with conventional delivery
systems, (4) evaluates the system, and (5) reviews the implications for
future use.

Background and System Design

Eisgruber (1967) and Bonnen (1975) have stressed the importance of
quality information and timely delivery for decision-making. While
computerized decision-making aids have been available to farmers for a
number of years (Candler, Debertin, Harsh, LaDue, McCarl), relatively
little has been done to improve the system for delivering data to farmers

in a timely fashion. Information retrieval systems for rural development leaders have been documented (van Es, Chapman). These systems utilize census data that require infrequent updating. Users must obtain desired information from centralized points. The CMN network provides current outlook statements for agriculture (Walker). This system is updated as a new statement becomes available and accessed through a computer terminal. The Green Thumb system is unique in that weather and marketing data may be updated as often as every 15 minutes each day. An additional feature is that data, while computerized, will be delivered directly to the farmer's television set.

The Green Thumb system is an interdisciplinary effort funded in part by grants from the National Weather Service and the Scientific and Educational Administration-Extension of the U.S. Department of Agriculture. Kentucky was selected to develop and test the feasibility of operating an information delivery system in two counties representing a diversity of agricultural production. In each county, one hundred farmers can access the information delivery system. Based on an evaluation of the pilot program, the concept may be expanded to one hundred-fifty counties in several states, and eventually, nationwide.

This project represents a major departure from past dissemination systems in that it provides for rapid transmission of data directly to users on an "on demand" basis. The delivery system utilizes computers, telephones, and television to deliver information directly to the users home.

Figure I provides a schematic overview of the delivery procedure. The heart of the system is a state level computer. This computer acts as a "post office" on collecting a variety of marketing and weather data on a 24-hour basis. The computer locates relevant data and forwards localized data to the two test counties. Data enters the state computer from: (a) the National Weather Service, (b) Chicago Board of Trade, (c) Chicago Mercantile Exchange, (d) local spot markets surrounding the two test counties, (e) extension specialists, (f) U.S. Department of Agriculture, and (g) County Agricultural Extension Agent.

Data transmitted to the test counties will be stored in a processor. Farmers access data in their homes by means of a micro-processor (called a Green Thumb Box) and a telephone. For the test, farmers will be provided a Green Thumb Box containing up to 16K of memory. Figure II illustrates a prototype box and the connections to a telephone and television. A farmer decides which information items he wants to see from the menu listing and enters a unique number code for that item directly into the Green Thumb Box by a key pad. He then makes a local phone call to the county processor. The requested data is transmitted by telephone to the farmer's Green Thumb Box where it is stored. Following data transmission, the phone is disconnected and the stored data is made available for viewing on the television screen at the farmer's convenience. Updates and/or requests for additional data requires the farmer to make another phone call.
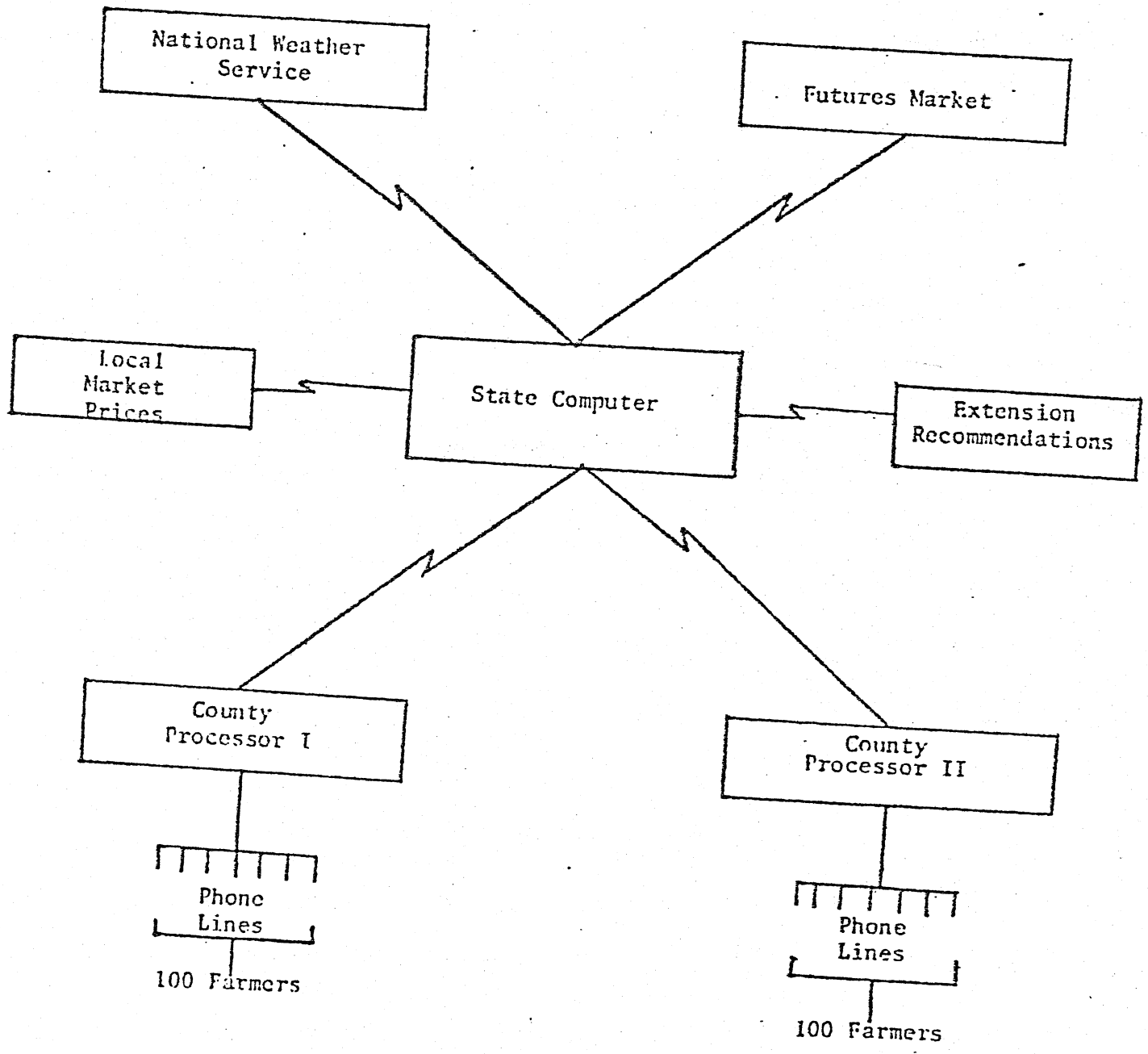
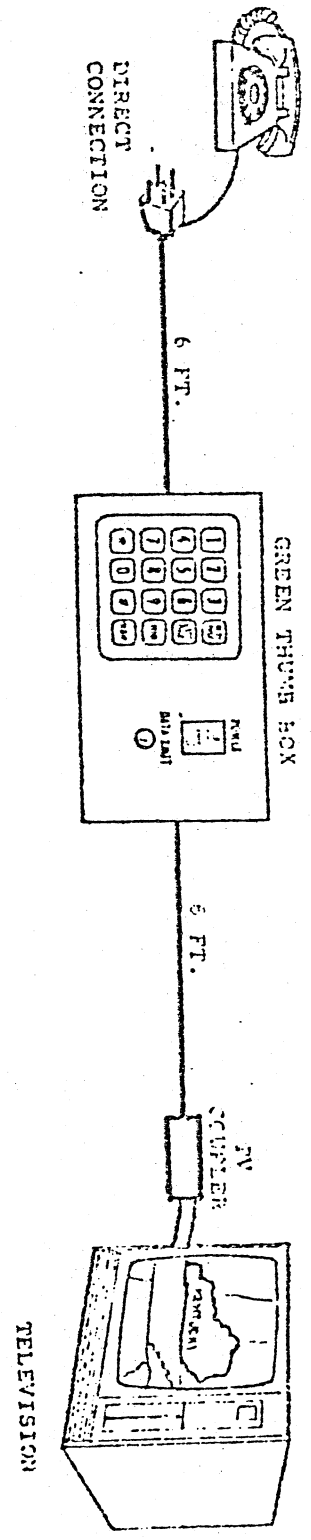Figure I. Schematic of Green Thumb Information Delivery System.

Figure II. Prototype Green Thumb Box with Telephone and Television.

Information Provided

Data to be delivered is designed to meet the needs of both commercial and smaller farmers. These clientele need timely market, weather, and other management information in order to make profitable marketing and management decisions (Welch). Weather and market data are available from a variety of sources including news media, Statistical Reporting Service, futures market trading exchanges, and local market outlets. Yet these sources of information often are not available in a timely fashion, and are available only by farmers having to make numerous calls or visits to several different locations. For example, weather data may be several hours old and farmers may not know when a particular forecast was issued. Price data may be yesterday's quotes, or an individual may have to make several calls to obtain current information. The Green Thumb system is designed to deliver data quickly and directly to farmers' homes. Data will be kept current by frequent updates of the county processor by the state computer.

The system is designed to transmit data in both alpha-numeric and full graphics format which will allow tables, narratives, and color graphics to be used. The amount of data that can easily be read from a television screen is limited to 16 rows and 31 columns. This size does restrict the kind and amount of data that can be displayed on a television screen. However, a menu item might exceed the space limitation of a television screen. In these cases, remaining information will appear on successive screens.

Farmers from the test counties were consulted concerning what data they needed, its form, and frequency of update. Table 1 provides an overview of the menu items that a farmer will be able to access as the system begins operation in October of 1979. The system initially will have approximately 100 television screens of data, with a total capacity of 999 different screens.

Futures and cash price data will be provided for six commodities including corn, wheat, soybeans, live cattle, feeder cattle, and hogs. Futures prices will come from the futures market trading exchanges in Chicago. The state computer will collect the relevant data at 15 minute intervals for forwarding to county processors. Cash prices at local markets in or near the test counties will be collected at least three times each market day.

Weather data will be updated as the National Weather Service updates their forecasts and maps. This data will rely heavily on computer graphics. USDA releases will be entered as they are released in Washington. Extension specialists will enter recommendations in response to changing weather, disease, and market conditions.

A Comparison with Conventional Delivery Systems

Placing a monetary value on the usefulness of timely data for use in decision-making is difficult (Forster, Eisgruber, 1978). Despite this difficulty, the Green Thumb system offers the following advantages over other data delivery systems:

TABLE 1

OVERVIEW OF INFORMATION AVAILABLE ON THE GREEN THUMB
INFORMATION DELIVERY SYSTEM, OCTOBER 1, 1979

1. Futures prices by delivery month for six commodities which can be updated as often as every 15 minutes during market trading.

2. Local cash prices for six commodities updated at least three times each market day.

3. Weather maps and advisories, updated by the National Weather Service at least hourly and localized by zones within the state.

4. USDA reports and outlook statements, updated as they are released in Washington, D.C.

5. Extension specialists' recommendations by all disciplines within the College of Agriculture as weather and market conditions change. Examples include pest management alerts, disease outbreaks, and so forth.

6. County agent recommendations for each county.

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(1) Data will be more current and more localized than obtained from other sources such as radio and television.

(2) Users may obtain data on "a demand" basis anytime they desire.

(3) Data will be presented in a condensed manner without extraneous material.

(4) Extension recommendations can be delivered to users in a fraction of the time as compared to public meetings or distributing publications. Potentially, extension specialist time and expense can be saved.

In addition, the system is simple enough so that it requires no knowledge of computers or programming. The system is adaptable to a wide variety of data needs.

Potential difficulties include:

(1) Updated or additional data requires an additional phone call.

(2) Users face the limitation of viewing data on a television screen without hard copy.

(3) Participating states face the problem of coordinating a system of rapid updating of computerized data.

(4) Users must be educated as to how to access and use the system; how to interpret data and use data to make decisions.

Evaluation of the Data Delivery System

A detailed evaluation of costs and returns is being planned. However, a final evaluation will not be available until 1981. A portion of the evaluation will be handled electronically. Each farmer's Green Thumb Box has a unique identification number which can be recorded each time the user makes a phone call to the county processor. The time of day the call was initiated and the data items requested is also recorded. In this manner, data on peak loads and requested menu items will be readily available. The test is scheduled to run for 14 consecutive months beginning in October, 1979. Farmers will be periodically contacted during the test to determine which data items are most beneficial. Menu items will be adjusted depending on these results. A detailed exit interview will be held at the project's conclusion. Participating farmers will be used to determine acceptability and perceived benefits.

The University of Kentucky will keep detailed records of resources required to maintain the system including hardware purchased, software developed, and man hours required.

Summary and Implications

The Green Thumb project tests the feasibility for delivering localized weather, marketing, and agricultural recommendations directly to farmers. The system utilizes computers, telephones, and television to access and deliver information. The Green Thumb test is unique in that data is delivered directly to farmers' homes, and data is updated as often as every 15 minutes on a continuous basis.

This project has implications far beyond the scope of the Kentucky test. An evaluation of Kentucky's experiences will be used to decide whether the concept should be expanded to 150 counties in several states, or even nationwide. Other types of agricultural data banks could be used on this type of system. Examples might include agricultural newsletters, gardening facts, pest management, disease alerts, data on agribusiness firms, and food price alerts for consumers. Farmers wishing to use decision-making models now must use computer terminals or pro- grammable calculators to access programs. The Green Thumb concept may well be the next evolutionary step beyond terminals and calculators. The Green Thumb Box could have the flexibility for solving small problems, or accessing large farm planning models as can now be done with a computer terminal. With proper education and training programs, farmers can use these decision-making models in the convenience of their homes utilizing a television set for display.

Nonagricultural data could be loaded on a similar system for delivery to American households and business firms. The list of

possible items is nearly inexhaustable. Examples might include airline
scheduling, listing of area movies, classified ads, supermarket prices,
traffic advisories, home shopping services, and receiving and sending
messages.

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