PROJECT GREEN THUMB:

A DEMONSTRATION IN WISCONSIN

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I. INTRODUCTION

A. Background

Green Thumb is an outgrowth of the joint agricultural weather program of the National Weather Service (NWS) and the Cooperative Extension Service. This program was divided into four parts: (1) data gathering by observers in rural areas, (2) preparation of localized weather and agricultural information, (3) dissemination of this information, and (4) education of the farm community as to how to best use that information.

The Space Science and Engineering Center (SSEC) at the University of Wisconsin-Madison was requested by the National Oceanic and Atmospheric Administration (NOAA) to develop and test a prototype of NOAA's Green Thumb system at various fairs in Wisconsin during the summer and fall of 1979.

Basically, SSEC's task was to determine the economic viability of the system by assessing the cost/benefit to farmers in Wisconsin.

B. Green Thumb System

The Green Thumb system is an information dissemination system designed to provide farmers with the latest localized weather, markets, agricultural and other pertinent information in their home at low cost. The proposed data flow is shown in Figure 1.

The Green Thumb "box" is the only part of the system to be purchased by the farmer. It plugs into his television antenna to enable an unused channel to be used as a computer display terminal, and plugs into his local telephone line to provide a farmer with a data link to the local county extension system. (The exact operations of the box at home will be discussed in section III).

The county computer provides the following data:

1. World climate and national market information from the NWS computer;
2. Local weather observations to be supplied by volunteer rural observers;
3. Local market information relevant to area farmers;
4. Local weather and agricultural forecasts supplied by the NWS;
5. State agricultural bulletins and information supplied by the State Extension Service; and
6. Local agricultural, home economics and meeting information supplied by the County Extension Service.

All of the preceding information can be updated as needed, and is accessible 24 hours a day.

C. Green Thumb Project at SSEC

Prior to the finalization of plans for a national Green Thumb system, it was decided to test a prototype in Wisconsin to determine the farmers' interest in the system. The project at SSEC consisted of the following tasks:

1. Define sample: after analyzing the demographics of Wisconsin agriculture, determine the best means of reaching the largest and widest sample of farmers;
2. Develop Green Thumb system within the time frame (3 weeks): develop an interactive computer system with color graphics which will enable the user to select the desired information using a menu approach to information selection;

3. Demonstrate Green Thumb: develop questionnaires to determine farmers' interest in Green Thumb and their needs for and uses of information contained in it, and publicize the demonstrations as a means of attracting a large audience; and
4. Analyze responses.

In the following four sections, each of these tasks is presented in detail, starting with a description of Wisconsin agriculture and determination of the test sample and procedures in Section II.

II. DEFINITION OF SAMPLE AND TEST PROCEDURES

A. Wisconsin Agriculture

Wisconsin's most productive agricultural region lies in a band from the southwestern part of the state northeast to Green Bay. The north central area also supports a productive dairying industry. Cash receipts from Wisconsin agriculture totaled over $3 billion in 1976, with more than half contributed by dairying. Table 1 presents a breakdown by commodity of Wisconsin cash receipts over a five year period. It should be noted that while crops account for only 18% of the cash receipts, they contribute 40% of the value of production for all commodities. A more detailed breakdown of crops, acres, yields, etc. can be found in Table 2 and a summary of Wisconsin's agricultural productivity relative to the nation's can be found in Table 3. Wisconsin produces a significant percentage of the nation's milk, butter, cheese, other dairy products, vegetables (peas, beans, beets, cabbage, corn and carrots), cranberries, hay, oats and mink. Many of the above are not particularly weather sensitive and have fairly stable prices.

B. Sample Selection

In order to assure that the Green Thumb sample would represent a cross section of farmers from the various agricultural counties in Wisconsin, it was decided to demonstrate the system at a number of county and regional fairs during the summer and fall of 1979. To permit adequate preparation time for each fair, demonstrations would be spaced two to three weeks apart during the fair season. The fairs were chosen with an eye to geographic and agricultural diversity. E.g., livestock predominates in the southwest, vegetables in the east-central region, etc. Further complicating the choice of fairs was the short lead time for making initial preparations.

CASH RECEIPTS FROM FARM MARKETINGS, By Commodities, Wisconsin, 1972-76

Commodity	1976	1975	1974	1973	1972
			1,000 dollars		
All commodities	3,028,639	2,655,640	2,463,831	2,279,648	1,849,198
All livestock	2,486,884	2,123,601	1,943,156	1,892,336	1,565,770
Meat animals	529,687	479,075	421,854	548,078	449,652
Cattle and calves	336,841	268,030	240,571	343,707	287,765
Hogs and pigs	190,133	208,651	178,796	201,764	159,296
Sheep and lambs	2,713	2,394	2,487	2,607	2,591
Dairy products	1,810,417	1,500,541	1,394,412	1,201,337	1,035,142
Poultry and eggs	114,288	115,202	100,285	117,893	62,442
Eggs	48,219	44,431	46,183	54,218	28,318
Turkeys	30,952	36,738	25,950	29,383	17,355
Broilers	12,813	12,770	10,350	16,222	8,746
Farm chickens	2,616	1,980	2,261	2,342	1,668
Miscellaneous poultry	19,688	19,283	15,541	15,728	6,355
All miscellaneous livestock	32,492	28,783	26,607	25,028	18,534
Mink	21,944	20,899	18,819	17,995	14,621
Wool	328	177	294	567	257
Honey and beeswax	5,163	2,999	4,196	4,654	2,452
Miscellaneous livestock	5,057	4,708	3,298	1,812	1,204
All crops	541,755	532,039	520,673	387,312	283,428
Field crops	262,821	267,225	261,427	180,977	128,710
Corn	166,947	161,203	164,840	114,597	72,670
Oats	15,385	19,460	16,223	11,295	11,136
Hay	35,277	39,432	24,368	23,027	17,670
Tobacco	15,998	13,872	11,492	9,074	12,356
Soybeans	20,216	23,216	34,147	19,415	13,076
Wheat	7,248	7,900	9,259	2,889	1,113
Barley	1,396	1,833	837	566	562
Rye	354	309	261	114	127
All vegetables	165,189	171,753	164,173	117,924	92,930
Potatoes	61,419	60,232	62,615	49,542	30,199
Sweet corn	25,003	24,535	21,763	14,802	15,544
Green peas	23,442	34,013	30,041	14,634	18,340
Snap beans	22,935	19,592	18,620	12,023	10,136
Cucumbers	5,207	5,289	5,702	5,207	3,866
Cabbage	4,330	5,972	4,020	4,178	2,197
Carrots	3,999	4,950	5,951	3,376	1,826
Beets	2,097	3,305	2,950	1,588	1,399
Onions	2,941	1,205	2,036	2,966	1,647
Green lima beans	1,030	3,135	1,195	1,104	940
Miscellaneous vegetables	12,786	9,525	9,280	8,504	6,836
Specialty crops	110,714	90,155	91,885	85,276	60,403
Apples	6,489	5,407	5,561	5,896	4,828
Cherries	1,471	999	1,822	960	782
Cranberries	12,935	10,881	9,135	10,050	9,997
Strawberries	1,470	1,576	1,687	1,379	1,117
Miscellaneous fruits and nuts	59	62	64	74	54
Greenhouse and nursery	29,141	26,738	28,154	24,180	21,842
Forest products	51,250	39,850	39,745	39,745	20,500
Mint	7,272	4,102	4,906	2,040	691
Maple products	627	540	811	952	592
All miscellaneous crops	3,031	2,906	3,188	3,135	1,385
Hay seed crops	962	950	1,196	1,187	202
Other miscellaneous crops	2,069	1,956	1,992	1,948	1,183
Government payments	14,282	14,083	13,298	39,794	57,106
Total cash receipts	3,042,921	2,669,723	2,477,129	2,319,442	1,906,304

Table 1. Cash receipts from farm marketings in Wisconsin. (from 1978 Wisconsin Agricultural Statistics).

CROP SUMMARY: Field Crops, Wisconsin, 1976-77

Crop	1977					1976				
	Acres harvested	Yield per acre	Unit	Production		Acres harvested	Yield per acre	Unit	Production	
				Total	Value				Total	Value
	Acres			1,000	1,000 dollars	Acres			1,000	1,000 dollars
Field crops										
Hay, all	4,040,000	2.97	Ton	12,002	654,109	3,980,000	2.04	Ton	8,126	568,820
Alfalfa	3,100,000	3.25	Ton	10,075	566,761	3,010,000	2.20	Ton	6,622	480,084
All other hay 1/	940,000	2.05	Ton	1,927	87,348	970,000	1.55	Ton	1,504	88,736
Oats	1,170,000	65.0	Bu.	76,050	83,655	1,280,000	43.0	Bu.	55,040	82,560
Corn for grain	2,750,000	104.0	Bu.	286,000	572,000	2,220,000	68.0	Bu.	150,960	320,035
Corn for silage	980,000	12.0	Ton	11,760	228,144	1,330,000	8.6	Ton	11,438	276,800
Soybeans for beans	192,000	34.0	Bu.	6,528	34,925	152,000	22.0	Bu.	3,344	22,405
Wheat, all	75,000	41.0	Bu.	3,075	6,065	93,000	34.8	Bu.	3,238	8,939
Winter	60,000	43.0	Bu.	2,580	4,902	64,000	37.0	Bu.	2,368	6,512
Spring	15,000	33.0	Bu.	495	1,163	29,000	30.0	Bu.	870	2,427
Barley	29,000	54.0	Bu.	1,566	2,427	32,000	40.0	Bu.	1,280	2,675
Rye	14,000	26.0	Bu.	364	655	12,000	21.0	Bu.	252	680
Red clover seed	8,000	95	Lb.	760	494	13,000	90	Lb.	1,170	714
Timothy seed	1,000	100	Lb.	100	50	3,000	120	Lb.	360	76
Potatoes 2/	55,500	325	Cwt.	18,038	70,348	53,000	290	Cwt.	15,370	60,712
Tobacco, all	12,050	2,059	Lb.	24,809	21,212	11,100	1,821	Lb.	20,209	15,144
Type 54	6,200	2,020	Lb.	12,524	10,708	5,600	1,890	Lb.	10,584	7,906
Type 55	5,850	2,100	Lb.	12,285	10,504	5,500	1,750	Lb.	9,625	7,238

CROP SUMMARY: Fruits and Vegetables, Wisconsin, 1976-77

Crop	1977					1976				
	Acres harvested	Yield per acre	Unit	Production		Acres harvested	Yield per acre	Unit	Production	
				Total	Value				Total	Value
	Acres			1,000	1,000 dollars	Acres			1,000	1,000 dollars
Fruits and Specialties										
Apples	–	–	Lb.	56,000	7,672	–	–	Lb.	52,000	6,136
Tart cherries	–	–	Lb.	12,200	3,526	–	–	Lb.	5,900	1,528
Cranberries 1/	6,400	135.9	Bbl.	870	11,745 2/	6,800	147.6	Bbl.	1,004	13,554
Strawberries	1,300	2,400	Lb.	3,100	1,426	1,400	2,500	Lb.	3,500	1,470
Maple syrup	–	–	Gal.	130	1,547	–	–	Gal.	66	851
Peppermint, oil	7,200	33	Lb.	238	3,951	8,800	39	Lb.	343	5,317
Spearmint, oil	2,900	37	Lb.	107	1,969	2,600	40	Lb.	104	1,862
Vegetables, fresh										
Cabbage	1,500	424	Cwt.	636	4,121	1,100	462	Cwt.	508	2,176
Carrots 3/	3,500	467	Cwt.	1,636	5,320	3,300	382	Cwt.	1,262	4,043
Lettuce	1,400	230	Cwt.	322	3,107	1,400	230	Cwt.	322	3,993
Onions	1,200	290	Cwt.	348	1,724	1,400	295	Cwt.	413	3,463
Vegetables, processing										
Sweet corn	130,700	4.56	Ton	596	25,211	129,700	4.19	Ton	544	21,863
Green peas	107,500	1.36	Ton 4/	146	29,825	117,200	1.02	Ton 4/	120	23,442
Cucumbers	9,400	6.23	Ton	59	7,436	10,100	4.41	Ton	45	5,207
Snap beans	67,200	2.76	Ton	185	23,738	69,500	2.45	Ton	170	22,814
Beets	6,900	13.77	Ton	95	3,477	6,300	9.27	Ton	58	2,097
Green lima beans	5,900	1.17	Ton 4/	7	1,697	5,000	.92	Ton 4/	5	1,030
Cabbage, kraut	3,500	21.27	Ton	74	2,181	4,200	18.23	Ton	77	2,205

NUMBER AND VALUE OF LIVESTOCK: Wisconsin, January 1, 1977-78

Class of livestock	Number		Farm value per head		Farm value	
	1978	1977	1978	1977	1978	1977
	1,000 head		Dollars		1,000 dollars	
Cows and heifers that have calved	2,030	2,099	–	–	–	–
Beef cows	220	299	–	–	–	–
Milk cows	1,810	1,800	–	–	–	–
Heifers 500 pounds and over	856	897	–	–	–	–
For beef cow replacement	45	81	–	–	–	–
For milk cow replacement	696	688	–	–	–	–
Other heifers	115	128	–	–	–	–
Steers 500 pounds and over	308	304	–	–	–	–
Bulls 500 pounds and over	41	47	–	–	–	–
Heifers, steers, and bulls under 500 pounds	865	928	–	–	–	–
All cattle and calves	4,100	4,275	380.00	315.00	1,558,000	1,346,625
Hogs and pigs 1/	1,400	1,250	62.50	46.00	87,500	57,500
Stock sheep and lambs	73	72	–	–	–	–
Ewes 1 year and older	58	57	–	–	–	–
Ewe lambs	12	11	–	–	–	–
Rams and wethers 1 year and older	2	2	–	–	–	–
Wether and ram lambs	1	2	–	–	–	–
Sheep and lambs on feed	9	8	–	–	–	–
All sheep and lambs	82	80	46.00	35.00	3,772	2,800
Hens and pullets of laying age	4,275	4,700	–	–	–	–
Other pullets	1,422	1,366	–	–	–	–
Other chickens	44	64	–	–	–	–
All chickens 1/ 2/	5,741	6,130	1.65	1.75	9,473	10,728
Turkey breeder hens 1/	73	87	9.00	9.80	657	853
Total value	–	–	–	–	1,658,402	1,413,506

Table 2. 1976-7 crop and livestock summaries.

WISCONSIN'S RANK IN THE NATION'S AGRICULTURE

Commodity	Rank among states	Production	Percent of U. S.
DAIRY 1/			
Milk production	1	21,041,000,000 Lbs.	17.1
Butter	1	256,504,000 Lbs.	23.6
Cheese			
American	1	869,291,000 Lbs.	42.6
Swiss	2	36,884,000 Lbs.	19.5
Muenster	1	43,891,000 Lbs.	79.2
Brick	1	10,487,000 Lbs.	56.0
Italian	1	243,469,000 Lbs.	30.7
Blue	1	20,718,000 Lbs.	59.6
Total cheese excluding cottage cheese	1	1,278,890,000 Lbs.	38.1
Condensed milk, bulk			
Sweetened, whole	1	58,355,000 Lbs.	74.6
Sweetened, skim	1	30,695,000 Lbs.	48.2
Unsweetened, whole	3	31,822,000 Lbs.	21.0
Unsweetened, skim	3	126,859,000 Lbs.	15.9
Dry products			
Nonfat dry milk for human use	3	140,573,000 Lbs.	12.7
Skim milk for animal feed	5	590,000 Lbs.	7.5
Buttermilk	1	19,460,000 Lbs.	36.6
Dry whey 2/	1	311,703,000 Lbs.	38.8
Lactose	1	53,826,000 Lbs.	49.5
Condensed whey	1	34,881,000 Lbs.	24.0
Whey solids in wet blends	1	42,972,000 Lbs.	62.9
LIVESTOCK AND POULTRY			
All cattle and calves 3/	8	4,100,000 Head	3.5
Milk cows and heifers that have calved 3/	1	1,810,000 Head	16.6
All hogs and pigs 4/	12	1,400,000 Head	2.4
Turkeys raised 5/	9	5,544,000 Birds	4.1
Honey 1/	5	9,625,000 Lbs.	5.5
Mink 6/	1	926,000 Pelts	30.7
CROPS 1/			
Corn for grain	7	286,000,000 Bu.	4.5
Corn for silage	1	11,760,000 Tons	10.1
Oats	4	76,050,000 Bu.	10.2
All hay	1	12,002,000 Tons	9.2
Potatoes	7	18,038,000 Cwt.	5.1
Cherries, tart	2	12,200,000 Lbs.	5.7
Cranberries	2	870,000 Bbl.	40.9
Maple syrup	3	130,000 Gal.	10.6
Mint for oil	5	327,000 Lbs.	5.0
Cabbage 7/	4	2,125,000 Cwt.	9.0
Carrots 7/	4	1,636,000 Cwt.	8.2
Sweet corn for processing	2	596,000 Tons	25.3
Green peas for processing 8/	1	146,200 Tons	29.7
Beans, lima, for processing 8/	2	6,900 Tons	9.3
Beans, snap, for processing	1	185,450 Tons	27.4
Beets for canning	1	95,000 Tons	46.1
Cabbage for sauerkraut	2	74,450 Tons	32.3
Cucumbers for pickles	5	58,550 Tons	9.3

Table 3. Wisconsin's rank in the nation's agriculture.

The Wisconsin Department of Agriculture provided a list of the fairs and made suggestions as to which ones had the potential for drawing large audiences. We initially selected and contacted six, and got space at four: the main disappointment was that the two fairs contacted in the northern part of the state were either booked, or not interested.

The locations of our demonstrations (figure 2) were:

1) Dane County Fair, Madison - July 20-22: largest agricultural county of the state, leader in field crops and second in dairying and meat animals;
2) Racine County Fair, Union Grove - Aug. 3-5: leader in poultry and eggs, wheat, and second in soybeans;
3) Manitowoc County Fair, Manitowoc - Aug. 24-26: a large dairy region, also near the vegetable producing areas. Due to its lakeside location, and lack of proximity to a Weather Service Forecast Office (WSFO), Manitowoc residents are unusually skeptical about weather forecasting;
4) Vernon County Fair, Viroqua - Sept. 14-16: the last fair of the season, in a region noted for tobacco and dairying and close to fruit orchards.

In addition to the above, Green Thumb was also demonstrated at

5) Wisconsin Farm Progress Days held at Montford, Oct. 9-11 in the livestock area of the state. This is a statewide farm machinery, grain, pesticide, etc., show which rotates around the state from year to year. It is billed as the most significant show of its kind in the state.

The task of organizing, publicizing and demonstrating Green Thumb was made more difficult and time-consuming than need be due to the lack

1971 Green Thumb Demos

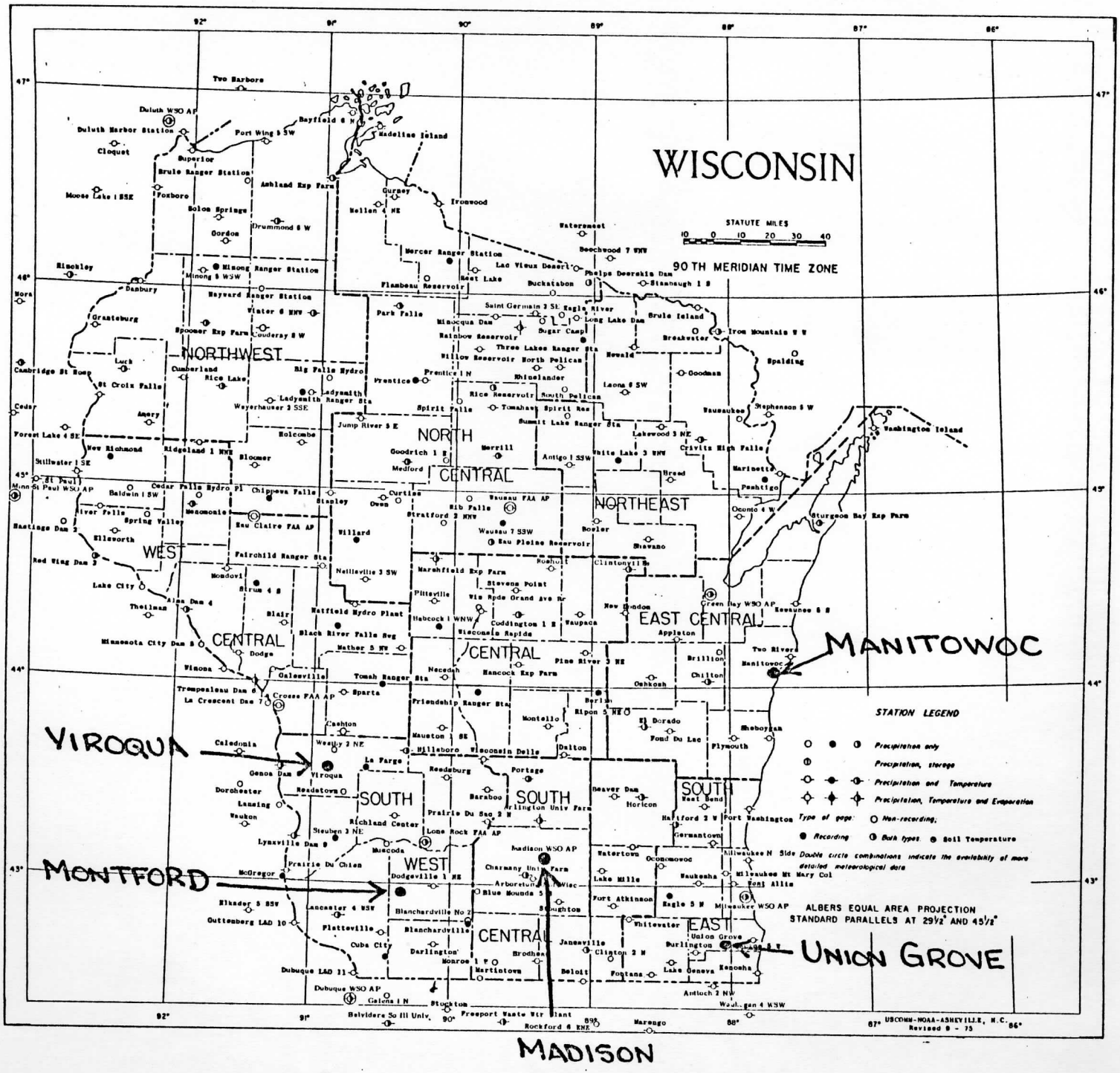


Figure 2. Locations of Green Thumb Demonstrations

of cooperation of the State Agricultural Meteorology Committee. One of the committee's tasks was a feasibility study of a program similar to Green Thumb. Although possessing the necessary contacts, the committee failed to provide them and made little effort to view the UW system once in operation.

III. THE GREEN THUMB PROTOTYPE

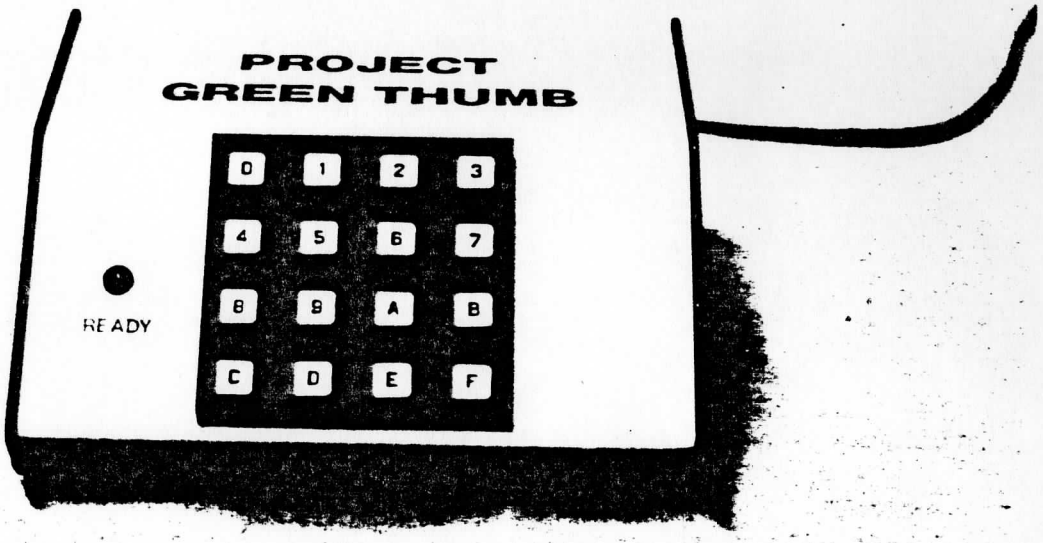
A. Basic Components

The basic components of our prototype system are an Apple II computer, a "floppy disk", a television monitor for display, plus a simple key pad "Green Thumb Box." Complete details can be found in Appendix C. The Project operated from two terminals, one located at SSEC into which the information was entered, and the other at the fairgrounds which was used to simulate the "at home" terminal. Communication between the two was over a standard phone line. The latter will be discussed first.

B. Remote Terminal

The "Green Thumb Box", a device resembling a touch-tone telephone, (figure 3) was connected to a television monitor and a phone jack. The television monitor was set to an unused channel. Hidden was the small computer and disk from which the information to be presented could be accessed. When not in use, the monitor showed a list of six (see figure 3) options: weather, agricultural advice, markets, world climate, local meetings and recent extension publications. By pressing the appropriate button on the Green Thumb Box, a sub-menu would appear on the screen associated with each of the above choices. The user would then choose the appropriate number corresponding to the information desired and the initial page of text could then be read. This remained on the screen until either the next page of text was chosen, or the menu was returned to. A complete listing of options can be found in Table 4. Each of the items was updated as needed:

1) Weather: The state forecast and weather warnings (shown graphically) came directly from the NWS. The current observations (updated every other hour) and the precipitation were shown both



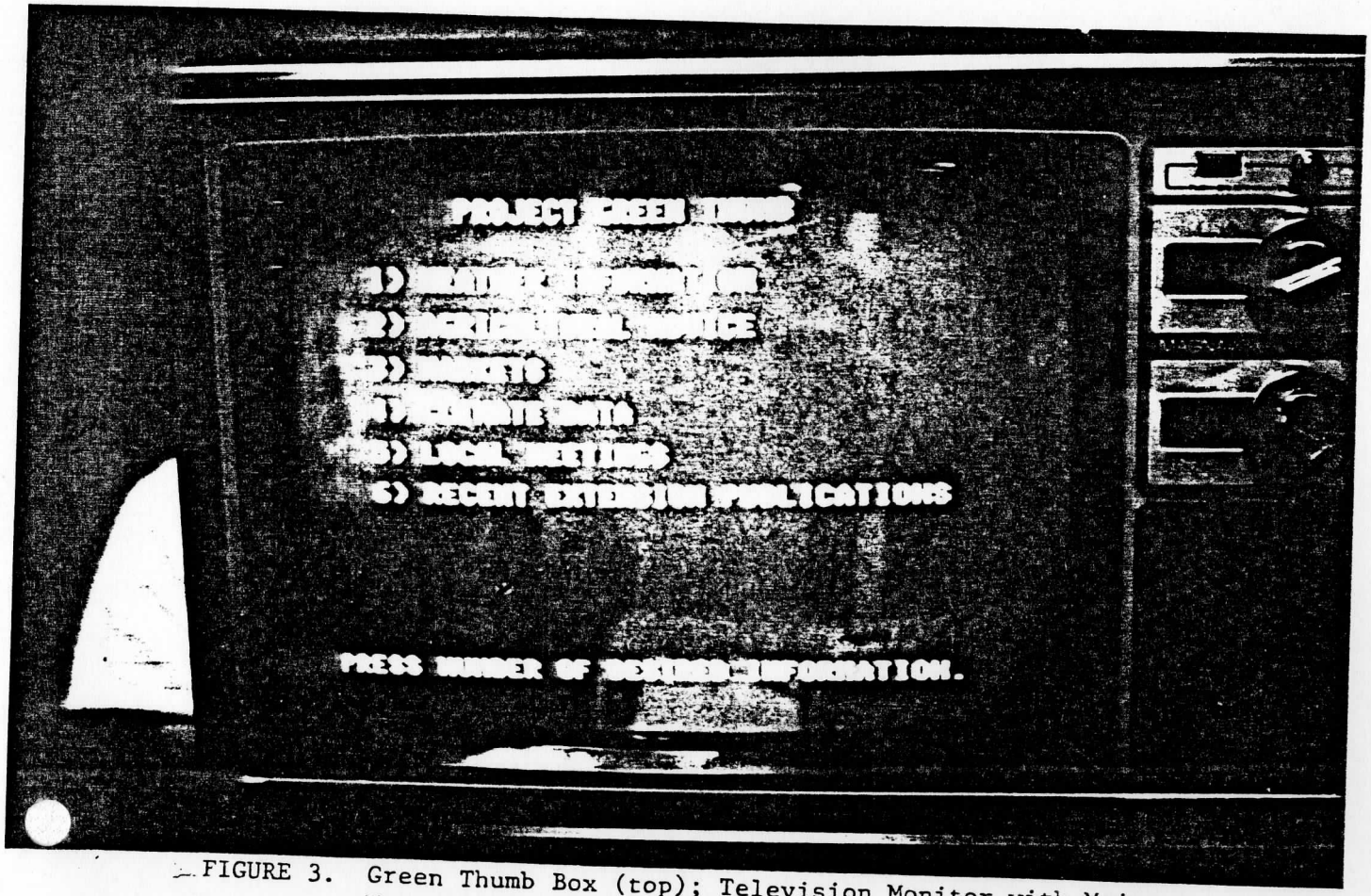


FIGURE 3. Green Thumb Box (top); Television Monitor with Main Menu displayed (bottom).

Table 4

Green Thumb Menu and Options

I. Weather

1. State Forecast (from NWS)
2. County Forecast
3. Agricultural Forecast (wind, dew points, sunshine, precipitation, and 3-5 day outlook)
4. 24-hour Precipitation (in tabular form and graphing on state map)
5. Current Area Observations (as in #4)
6. Radar (graphically on local, state, or area maps with text description)
7. Weather Warnings (issued by NWS)

II. Agricultural Advice (from County Extension Office); e.g.

Collecting Forage Samples

Armyworms

Establishing an Alfalfa Field

Corn Borers

Harvesting Weedy Small Grain Fields

Herbicides Sold by Long Distance Calls

Make Weed Maps Now!

2,4,5T Brushkiller Substitutes

Current DHIA Testing Rates

Tobacco Curing

Tobacco Field Information

Pickling Problems

Preserving Tomatoes

Wisconsin Agricultural Highlights

Housing Livestock

Balanced Dairy Rations

III. Markets

1. Livestock (Chic. Mercantile Exchange)
2. Wheat, Corn, Oats (Chic. Bd. of Trade)
3. Soybeans, Oil, Meal (Chic. Bd. of Trade)
4. Cash Markets--Grain
5. Cash Markets--Fruit and Vegetable
6. Cash Markets--Livestock
7. Special Reports (e.g. crop projections, trade deals, gold prices)

IV. World Climate

1. USSR
2. China
3. India-Southeast Asia
4. South America
5. Europe
6. U.S.--general
7. U.S.--grains
8. U.S.--fruits and vegetables

V. Local Meetings

Fair Schedule

4-H Schedule

Other Meetings

VI. Recent Extension Publications

in tabular form, and plotted on a Wisconsin map. The radar was indicated graphically to show intensity (by color), areal coverage and movement. We had the options of depicting the graphics on either a local (3 or 4 county), state or upper midwest map. Radar was updated hourly or as needed. The county and agricultural forecasts were generated in-house by meteorologists working for the program.

2) Agricultural Advice: These items were supplied by the county extension office who chose the topics and wrote the text. County extension cooperation was initially obtained with difficulty since the project was not operating under UW-Extension jurisdiction and therefore received initial opposition. In addition, some county agents feared for the security of their own positions if Green Thumb were to be implemented in their area. The number and quality of the items submitted varied, requiring some improvisation.

3) Markets: This information was obtained from SSEC's teletype terminal with cash market prices coming from the Chicago Board of Trade and the Chicago Mercantile Exchange, and futures prices coming from Chicago and Kansas City. Updates were transmitted as received, usually two or three times daily. The special reports came from United Press International. Although these market listings were not optimal, they were free (to the project) and readily available.

4) World Climate: Text was adapted from the Weekly Weather and Crop Bulletin issued by NOAA and the USDA. Although some of the information presented was dated, no negative comments were received regarding it.

5) Local Meetings: The schedules were supplied by the fairs, county extension offices and county 4-H clubs.

6) Recent Extension Publications: A list of all relevant extension bulletins issued within the past year, identification number, cost, and how to obtain them. The bulletins' relevance was decided by the Project.

An update to the text could only be made with the system dwelling on the main menu, at which point an appropriate message was displayed and viewer access to the files was limited. Unlike the proposed operational system, there was no limit as to the number of pages of text that one viewer could obtain at a given time.

C. Main Terminal

The terminal at SSEC was the same as that at the fairs except that it contained a joystick controller for drawing graphics instead of a "Green Thumb Box." Prior to each demonstration a new file structure was set up with text for items (2, 4, 5, 6 [not changed at the fairs]) entered. This disk was then duplicated and sent out with the remote system to the fair site. When a file was to be updated, it was accessed, corrected and its name entered on an update list. When all the updates were completed for a given time, the computer automatically dialed up the remote terminal on the telephone and re-wrote all the files from the update list. When complete, it automatically hung up, and the update list became void. The operator at the main terminal also had the option of operating in the same mode as the remote terminal (viewing only) by using the keyboard of the Apple II as he would the "Green Thumb Box." The mechanics of entering and editing the graphics were similar to that described above, and are given in greater detail in Appendix C.

IV. THE FIELD PHASE

At each of the county fairs, the project was assigned a booth in the building or tent that housed commercial exhibitors. At some fairs, this location was detrimental because the agricultural and commercial exhibits were at different parts of the fairgrounds, and the latter were not visited by farmers. None of the fairs had a directory of exhibitors so it was possible that prospective viewers were not able to locate the Green Thumb exhibit. Farm Progress Days was held on two farms with each of the hundreds of exhibitors occupying their own tent; each tent's location was listed in a brochure.

The demonstration booth was divided into three areas (see figure 4): (1) the display area where the system and information flow was shown, and handouts (figure 5) were available; (2) the Green Thumb System consisting of the television monitor and "Green Thumb Box"; and (3) a separate area where questionnaires could be filled out anonymously and a log book could be signed. The set-up worked rather well.

The questionnaire (see figure 6) was designed to gather the following information: Would the responder use the system? If so, how much would he be willing to pay (rent) for it? Is the information on the system useful for his operation and is he currently receiving it? In addition, demographic information was obtained to determine the representativeness of the sample, and to see if the responses varied with the size and type of the farming operation.

Once the arrangements, fees, etc. were taken care of, each demonstration took one week's time. For a typical fair, set-up would occur at the fair site on Monday including a check of phone and electrical service. In

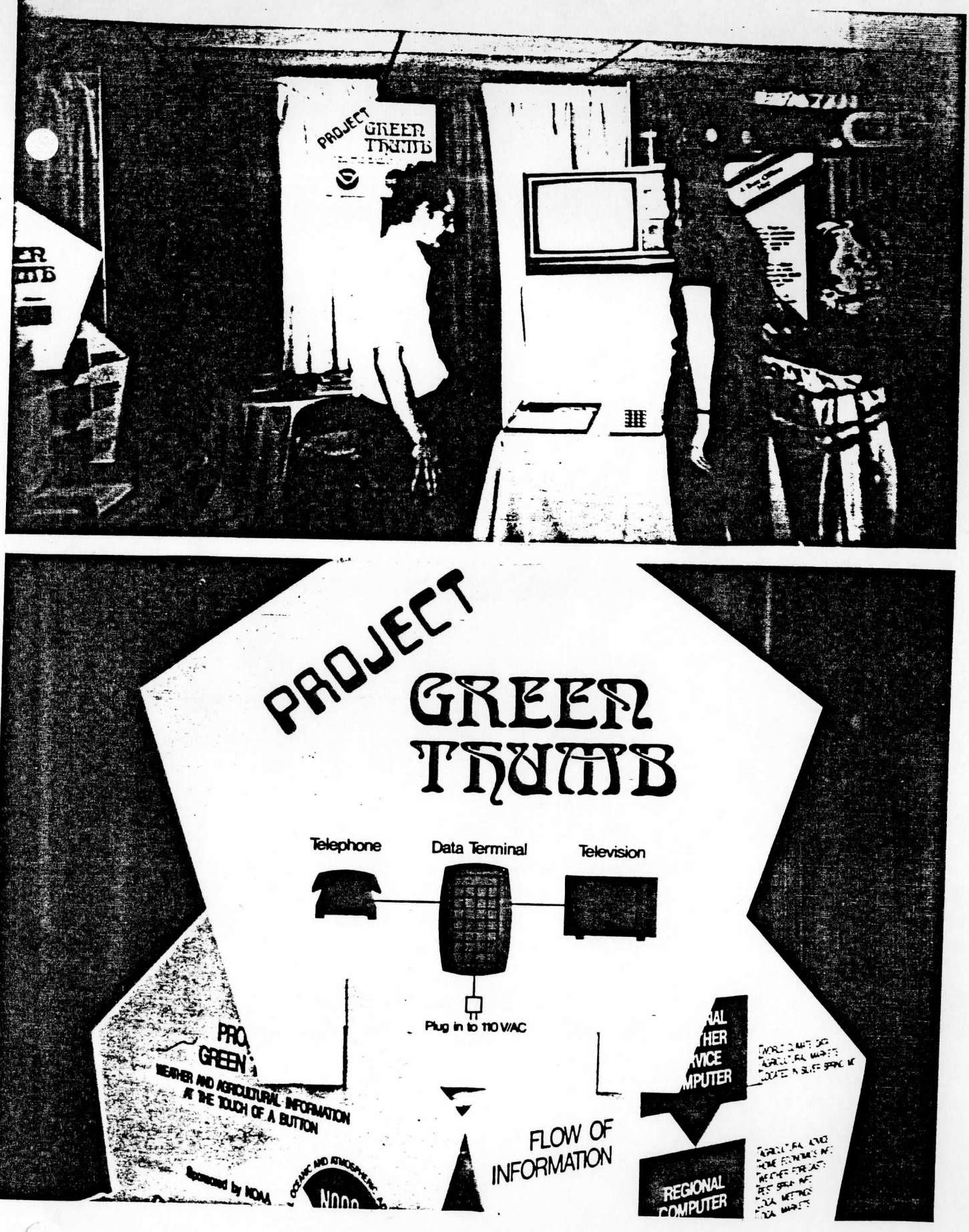


FIGURE 4. Green Thumb Booth at Dane County Fair.

Figure 5. Fair handout.

PROJECT GREEN THUMB

The Green Thumb Project is a look ahead at the information sources of the future. It is not in operation yet; however, a pilot program is underway in Kentucky. The Space Science and Engineering Center of the University of Wisconsin-Madison is demonstrating a prototype of the system here in Wisconsin and trying to determine if Wisconsin farmers are interested in the service. Your responses to our questionnaire will be forwarded to the National Oceanographic and Atmospheric Administration who along with the U. S. Dept. of Agriculture & Agriculture-Extention will be making the decisions about the development and deployment of the Green Thumb system.

Objective of the System

The objective of the proposed Green Thumb system is to provide farmers with a means of receiving the most up-to-the-minute agricultural information in their homes at their convenience. This will be done by means of a "box" connected to the user's television set and also linked by telephone lines to a county computer where the latest information on local weather, agricultural markets, pest, spray information, meetings, 4-H, and home economics is available.

How the System Works

To use the Green Thumb box, the user simply turns on his television set, dials to a unused channel, and telephones a local county extension computer. A "table of contents" of the computer will be displayed on the user's television screen, listing by number the types of information available. By pressing a corresponding numbered button on the Green Thumb box the desired information is displayed on the user's television screen.

The Green Thumb box will be portable, reasonably priced, and easy to use. No special training will be needed in order to use it.

Space Science & Engineering Center
University of Wisconsin-Madison

Figure 6. Green Thumb questionnaire.

GREEN THUMB QUESTIONNAIRE

We appreciate your taking the time to complete this questionnaire. Your responses will be sent to Washington and will help advise those making decisions about the Green Thumb project. The "Green Thumb Program" is not currently in operation, though it is hoped to be developed in the near future (one or two years). Your information will provide a needed input into the design and form of this system.

Thank you.

Space Science & Engineering Center
University of Wisconsin-Madison

National Oceanographic &
Atmospheric Administration

1. Would you use a Green Thumb Box if it were available?

   Yes ___ No ___

2. What is the most you would be willing to pay to have such a box in your home?

   Under $100 ____ $200-300 ____

   $100-200 ____ over $300 ____

3. If the box were free, but the data service cost, what is the maximum monthly price you would be willing to pay for the data service?

   Under $20 ____ $35-50 ____

   $20-35 ____ over $50 ____

4. Which type of data presented would you be able to use in your operation?

   a. Weather Information ____
   b. Agricultural Advice ____
   c. Markets ____
   d. World Climate Data ____
   e. Meetings, etc. ____
   f. 4-H Information ____
   g. List of Extention Bulletins ____

5. Are you currently receiving all of the above checked items?

Yes ___ No ___

If not, which items do you not currently receive.

a. Weather Information ____

b. Agricultural Advice ____

c. Markets ____

d. World Climate Data ____

e. Meetings, etc. ____

f. 4-H Information ____

g. List of Extention Bulletins ____

6. Do you feel that any of the items in (#4) should <u>not</u> be in the Green Thumb Box? Yes ___ No ___

Which one(s)? _____

Please explain _____

_____

7. Would you make any additions to what was presented?

Please list _____

_____

_____

_____

_____

8. Are you a farmer? Yes ___ No ___

Do you own your own farm? Yes ___ No ___

How much land do you farm?

1-49 acres ____
50-99 acres ____
100-199 acres ____
200-499 acres ____
over 500 acres ____

9. Do you raise:

Dairy Cows ____
Beef Cattle ____
Hogs ____
Poultry ____
Eggs ____
Other Livestock ____

Apples ____
Cherries ____
Cranberries ____
Other Fruit ____

Corn ____
Oats ____
Hay ____
Tobacco ____
Soybeans ____
Wheat ____
Barley ____
Rye ____

Potatoes ____
Sweet Corn ____
Green Peas ____
Snap Beans ____
Cucumbers ____
Cabbages ____
Carrots ____
Other Veg. ____

10. Is the size or shape of the box important to you?

Please indicate ____ _____

_____

_____

11. Do you have any other comments on what you have seen today?

_____

_____

_____

_____

_____

_____

PLEASE SIGN IN LOG BOOK. THANK YOU FOR YOUR TIME.

addition, project personnel also met with fair officials and local reporters to arrange publicity, and obtained and discussed the agricultural advice section at the county extension office. The rest of the week would be spent loading the system and familiarizing ourselves with the meteorology and agriculture of the area. The Green Thymb system would then be demonstrated from Friday through Sunday. Prior to presenting the questionnaire results, the peculiarities of each area will be discussed to aid in their interpretation.

1) Dane County Fair: Although Dane county is in the center of the most productive agricultural region in Wisconsin, this was largely an urban fair. The agricultural and commercial exhibits were far apart and Green Thumb was largely lost in the County Coliseum with more than a hundred other commercial exhibits. Most of the visitors were from the immediate Madison area, although extensive media exposure in newspapers, radio and television brought farmers to see this exhibit from a radius of over sixty miles. The system was not complete here with neither the graphics nor the communications link functioning (updates were hand-carried to the fair). The farmers in this area already had easy access to much of the information presented plus the advantages of a WSFO in Madison.

2) Racine County Fair: The fair was plagued by severe weather during much of the project's stay, with both tent and display being damaged; there was no safe place to "hide" on the fairgrounds during these storms. Many of the people in this area appeared to be resistant to new ideas and in some instances, seemed very

hostile. There was also less cooperation from the fair administrators and media representatives than at any other demonstration. Consequently, the fewest responses were obtained here.

3) Manitowoc County Fair: Because of its location along Lake Michigan, weather is of great concern to area farmers and weather forecasts are rarely trusted. Due to a break in two weeks of rain, many farmers were in the fields cutting hay, and the turnout was smaller than expected. The local extension people were very cooperative and interested.

4) Vernon County Fair: This was the smallest and most rural of the fairs, and was probably the most successful. The cooperation of local radio and newspaper helped, and although people were initially skeptical, they were receptive.

5) Farm Progress Days: The people who visited Farm Progress Days were all business; they came for a purpose and provided the biggest turnout. The cold and damp weather discouraged people from sitting down and filling out questionnaires.

V. RESULTS

For each demonstration, the questionnaires were tabulated for farmers and non-farmers separately. The results are composited in Table 5. The responses to the questions concerning the demographic information and the contents of the system are summarized for farmers only. Details from each display along with relevant comments are given in Appendix B. The sample was split evenly between farmers and non-farmers with the bulk of farmers coming at the last two demonstrations. To summarize:

1) About 90% of the total sample (93% of the farmers) would use the system if it were available;
2) The size and shape of the box was not important as long as it remained compact;
3) As would be expected, people wanted to pay as little as possible--about 93% under $200. The $100-$150 range was viewed as most reasonable. The respondents were much more willing to buy the box than rent it;
4) The sample farms were on the whole larger than the state average. About 2/3 were dairy farms, on which corn, oats and hay were also raised. About 1/3 of the farmers raised cattle and hogs, 1/10 vegetables, and 1/6 either tobacco, poultry or soybeans. Thus a sample of Wisconsin's most significant farming activities was reached;
5) The dairy-only farmers found Green Thumb less useful than those raising cash crops or livestock because dairy prices are more stable and dairy farms are less weather dependent. The size of the farms had little relation to the responses;

PROJECT GREEN THUMB

FARMER	YES	NO
	308	263
OWN LAND	264	234

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
(Farmers)	35 (11.7%)	26 (8.7%)	77 (25.8%)	122 (40.9%)	38 (12.9%)
State:	9.9%	16.0%	33.8%	34.7%	5.6%

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	308	219	32	9
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	396	139	14	4

F/ ERS ONLY:

SAMPLE: 315

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	201	106	93	53	29	20	4	1	46

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	274	214	53	48	28	5	5	259	

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	43	66	42	28	34	33	38	34

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	287	252	267	67	119	84	150
DATA NOT RECEIVED	63	98	83	81	88	70	101
DATA CONSIDER IRRELEVANT			1	18	7	9	4

COMMENTS

FARMERS ONLY: SAMPLE: 315

	YES	NO
WOULD USE A GREEN THUMB BOX	498 274/224 (Farmer/Non-Farmer)	56 22/34 (Farmer/Non-Farmer)
SIZE & SHAPE IMPORTANT	68	373
COMMENTS	TOTAL SAMPLE: 585	

6) The information of greatest interest was weather, agricultural advice and markets. In fact, some people stopped by several times a day to either follow the weather or markets. The market information from Dubuque or Milwaukee would have been more useful in Wisconsin than the Chicago markets. The county weather forecasts and radar had great appeal though a good 3-5 day forecast was most important to the farmers. Finally, in the more rural counties, Green Thumb was viewed as having the potential to be an important local communications medium.

7) One third of those surveyed either had little contact with the local extension offices or were not aware of what they had to offer.

8) The main suggestions received were for "accurate" long-range market and weather predictions, and more localized market information. In addition, many people viewed this as the best local communications device available.

Many of the potential viewers expressed hostility toward anything run by the federal government, associated with the university, or more importantly, that cost money. Initially people had to be convinced that they would neither be sold anything nor be put on any government mailing list before they would even approach the booth. Many were "rugged individualists" who felt the government had no business meddling in their lives. After that hurdle was overcome, less than half of those willing to view the system would fill out the questionnaires. Older people were, as a rule, more cautious and reluctant, while a number of the women felt that it was not their place to have an opinion.

Only one of the many people in either state or county extension with

whom project personnel dealt took the time to observe the system; only one member of the state Agricultural Meteorology Committee came.

Finally, many of the respondents were very enthusiastic and anxious to see a Green Thumb system operating in Wisconsin in the near future.

VI. SUMMARY

Under a very short lead time, a prototype Green Thumb system was developed, built, and demonstrated at five different sites across Wisconsin during the period July-October 1979. Those viewing the system were asked to anonymously complete questionnaires on their reactions to what they saw. The primary conclusions based on their answers are:

1) A very high proportion of those responding would use a Green Thumb system if it were available;
2) Respondents were willing to spend $100-150 to buy a "Green Thumb Box", and preferred a purchase to rental; and
3) The weather, agricultural advice and markets were the most useful information presented.

Many of those viewing Green Thumb saw a potential in this system as a communications device far beyond that for which it was originally planned. Because of the enthusiastic response, it is hoped that an operational Green Thumb program can be set up in Wisconsin in the near future where it will be positively received and of great value.

A. MEDIA COVERAGE

Prior to each fair, local newspapers were supplied with a packet of descriptive information as a means encouraging newspaper coverage of Project Green Thumb. In addition, a press release was issued by the UW News Service and sent to most of the newspapers across the state in mid-July. The newspaper articles then led to radio interviews with the State Educational Radio Network in Madison, and local stations in Viroqua, Green Bay, Fond du Lac, and Dubuque, Ia., as well as television coverage in Madison.

The media, especially in Madsion and Viroqua, brought people to the demonstrations who would not ordinarily have come to the fairs.

The following are the press clippings of which we are aware.

uw news

From the University of Wisconsin-Madison / News Service, Bascom Hall, 500 Lincoln Drive, Madison 53706 / Telephone: 608/262-3571

Release: Immediately 7/17/79 jhs

'PROJECT GREEN THUMB' DEMONSTRATIONS SLATED

MADISON--Wisconsin farmers will get a preview during the next three months of what could become an agricultural information service of the future, University of Wisconsin-Madison weather scientists have announced.

A prototype of the federal Project Green Thumb concept, in which farmers could get weather and agricultural information through their home television sets, will be demonstrated at four county fairs and Wisconsin Farm Progress Days between July 20 and Oct. 11. The demonstrations will be conducted by UW-Madison's Space Science and Engineering Center, which also will survey farmers in an attempt to determine the value of the idea.

"Green Thumb" would use a box hooked into the user's television set and linked by telephone lines to a computer probably located at the county extension agent's office. Up-to-the-minute information could be obtained, upon request, on weather, markets, pests, insecticides, meetings and home economics. The cost would be recovered by some combination of basic charge or user fees.

A pilot program is presently being tested in Kentucky by the National Oceanic and Atmospheric Administration and the U.S. Department of Agriculture and Agriculture-Extension, the federal agencies which must decide the concept's fate.

The Wisconsin demonstrations are scheduled July 20-22 at the Dane County Fair in Madison; Aug. 4-5 at the Racine County Fair, Union Grove; Aug. 25-26, Manitowoc County Fair, Manitowoc; Sept. 15-16, Vernon County Fair, Viroqua; and Oct. 9-11, Wisconsin Farm Progress Days at Montfort in Iowa County.

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Farmers to be surveyed on weather system

Metro
Wisconsin State Journal
• Tuesday, July 17, 1979, Section 4

By Robert C. Bjorklund
State Journal Farm Editor

A survey of farmers and business agriculturists starts Wednesday at the Dane County Junior Fair to see if they want to be part of an improved weather and farm information system called Project Green Thumb.

David Suchman, associate scientist with the Space Science and Engineering Center on the University of Wisconsin-Madison campus, said farmers will get a chance to see how the system works in demonstrations through Sunday at Booth 50 in the Dane County Coliseum.

With the survey, Suchman said he wants to learn what information the farmer needs most and whether or not he would find such a system useful. If there is interest money could become available to continue the work in Wisconsin, he said.

The immediate information from county and state computers is transmitted directly to the farmer's home television screen.

Information, which appears on an unused television channel, will come when the farmer dials a special number at his county Extension office and is connected to a small computer. He chooses the information he wants and this data will be loaded into a "Green Thumb Box" and run off on his television set. If he wants more information, he orders up another eight screens full.

"We'd like to show how people can get immediate county and agricultural weather forecasts, up-to-the-moment livestock and grain market reports, a summary of world climatic data, recommendations on weed and insect control, irrigation recommendations, publications available and things like farm meetings and 4-H news," he continued.

If a farmer wants weather information he enters a code number and the computer returns the latest state and county forecasts, extended outlook, a special weather elements forecast, local weather observations and a radar picture showing precipitation and its intensity and movement.

The National Oceanographic and Atmospheric Administration (NOAA) has provided Wisconsin with a $35,000 grant to get a cross-section of farmer reactions and suggestions on how the service should be run.

On Sept. 15 and 16, the same survey will be made at the Vernon County Fair and on Oct. 9 to 11, farmers will get the program details and survey form at the Wisconsin Farm Progress Days, Montfort.

Racine and Manitowoc farmers will be surveyed at those county fairs in August.

NOAA developed the system for a look at the information sources of the future, Suchman said.

Currently a pilot program is under way in Kentucky and whether or not the program will be used in Wisconsin depends on the interest shown in the survey.

"What we are attempting to do with the Green Thumb system is to provide farmers with a means of receiving the most up-to-the-minute agricultural information in their homes. The system will be reasonably

Wisconsin has been part of early testing of a system also used in 10 other states to get weather from farm observers to a central computer to provide data for county-by-county forecasts.

Weather information was the main part of the system and once the problems of localized weather and farm information were solved, the work was expanded to provide information at a minimum cost to both the farmer and the government. Farmers will be asked how much they will pay for such a system.

Suchman said the Green Thumb Box is the key to the system. The farmer will either purchase or lease

He explained how one set of wires from the box will be connected to the antenna terminals of the home television receiver and the other will plug into the telephone line, thus connecting the television set with the computer and making it a computer terminal.

Suchman said the system also can be used so volunteer observers can enter weather information into it.

Racine Journal-Times
AUG 7 1979

Farmers get preview of data via TV

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By Thomas Locante
Journal Times Staff

Some Racine County Fairgoers had a chance to preview an information system which some scientists say could become an agricultural information service of the future.

A prototype of the federal project "Green Thumb," in which farmers could get weather and agricultural information through their home television sets, was demonstrated by UW-Madison extension scientists.

Green Thumb would use a box hooked into the user's television set and linked by telephone lines to a computer probably located at the county extension agent's office, said David Suchman, a UW-Madison Space Science Engineering Center associate scientist.

He said up-to-the minute information could be obained, upon request, on weather, markets, pests, insecticides, meetings and home economics. He said the cost would probably be a one time $200 charge for the box.

The demonstration at the fair consisted of the box and a a TV screen. A "menu" of information was on the screen. When the number for weather was pressed, for example, a choice of local, regional and state forecasts appeared, as well as radar.

Suchman said eight pages of information could be obtained at one time.

He said the advantages of the system are the cost and the 24 hour convenience.

"From what we've found out, the same market information available in this system, for example, would cost several hundred dollars a month for a farmer to buy," he said.

Suchman said approval of the system by observers was strong. "The reaction is very positive," he said. "Only four persons said they wouldn't use it."

Suchman said they are hoping to receive another federal grant in February. If this happens, he said, they would help set up a pilot system in selected Wisconsin counties.

He said eventually, the system would stretch nationwide.

Project Green Thumb to be at County Fair

Wisconsin farmers will get a preview during the next three months of what could become an agricultural information service of the future, including a demonstration at the Vernon County Fair, University of Wisconsin-Madison scientists have announced.

Viroqua Broadcaster & Censor

AUG 2 1979

A prototype of the federal Project Green Thumb concept, in which farmers could get weather and agricultural information through their home television sets, will be demonstrated at four county fairs and Wisconsin Farm Progress Days between July 20 and Oct. 11.

The demonstrations will be conducted by UW-Madison's Space Science and Engineering Center, which also will survey farmers in an attempt to determine the value of the idea.

"Green Thumb" would use a box hooked into the user's television set and linked by telephone lines to a computer probably located at the county extension agent's office. Up-to-the-minute information could be obtained, upon request, on weather, markets, pests, insecticides, meetings and home economics. The cost would be recovered by some combination of basic charge or user fees.

A pilot program is presently being tested in Kentucky by the National Oceanic and Atmospheric Administration and the U.S. Department of Agriculture and Agriculture-Extension, the federal agencies which must decide the concept's fate.

The Wisconsin demonstrations are scheduled July 20-22 at the Dane County Fair in Madison; Aug. 4-5 at the Racine County Fair, Union Grove; Aug. 25-26, Manitowoc County Fair, Manitowoc; Sept. 15-16, Vernon County Fair, Viroqua; and Oct. 9-11, Wisconsin Farm Progress Days at Montfort in Iowa County.

Broadcaster-Censor, Viroqua, Wis., Sept. 13, 1979

Space age info demonstration at Vernon Fair

A prototype of a space-age home information system will be at the Vernon County Fair on Friday, Saturday and Sunday.

"Project Green Thumb", which involves getting weather and agricultural information over television sets from a computer in the local extension office, is bringing two people to the Fair to survey potential customers of the system.

"Green Thumb" would use a box hooked into the users TV and linked by telephone lines to the computer. Up-to-the-minute information could be obtained by request concerning weather, markets, pests, insecticides, meetings and home economics. The costs would be recovered by some combination of basic charge or user fees.

Andy Edman and Vida Groman will be demonstrating the system for the University of Wisconsin-Madison Space Science Center and will be asking questions of Fair visitors to gather information under a federal grant to the University in cooperation with the Extension. They will be in the Commercial building from noon Friday through Sunday during hours the Fair is open.

The system will not be for sale in Viroqua yet, but will be demonstrated, opened for trial use and will be the focus of questions such as "Are you interested?", "What should it cost?", "What information should be available?" and "What use would you have for it?".

Results of this survey and results from three other areas of Wisconsin will be forwarded to the U.S. Department of Agriculture.

A pilot program is presently being tested in Kentucky by the National Oceanic and Atmospheric Administration, the USDA and Ag-Extension, agencies that will decide whether the program is needed and is viable.

The study being done in Wisconsin is the only additional consumer information currently being prepared for the decision.

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Area farmers to preview information service

By MICHAEL J. SIBILSKY
Area News Editor

MANITOWOC – Lakeshore Area farmers will soon get a preview of what could become an agricultural information service of the future, and perhaps get the last laugh in their appeals to grinning TV weathermen and unknowing radio disc jockeys.

How soon? Saturday and Sunday, Aug. 25-26, during the six-day run of the Manitowoc County Fair.

Dr. David Suchman, associate scientist with the Space Science and Engineering Center, University of Wisconsin-Madison, said a booth will display a prototype of the federal "Project Green Thumb" concept – via which farmers could get instantaneous CRC Weather-Link data and other agricultural information through home television sets – at their leisure.

And with an on-site questionnaire, farmers will be surveyed in an attempt to determine the value of the purported time and money-saving idea.

According to Suchman, "Green Thumb" would use a box hooked into the user's television set and linked by telephone lines to a computer probably located in the county UW-Extension office.

Up-to-the-minute information could be obtained, upon request, on weather, markets, pests, insecticides, spraying techniques, 4-H activities and home-economics.

Cost would be recovered by some combination of basic charge or user fees, Suchman said.

A pilot project is being tested in Kentucky by the National Oceanic and Atmospheric Administration and the U.S. Department of Agriculture-Extension, the federal agencies which must decide the concept's fate.

What are specific, potential benefits of the system? The Agricultural Weather Program of the National Weather Service and Cooperative Extension Service offered additional explanations:

"Weather drives biological mechanisms and is one of the most important variables faced by farmers. Understanding weather and its effects on the biological systems within agriculture opens up possibilities for great breakthroughs in controlling pests and optimizing the efficiency of agricultural production.

"Entomologists know insects require certain weather conditions for development. By monitoring weather near fields where crops are grown, it is possible to model insect's development and predict when it can be present. If weather conditions show an insect cannot be present at the stage of development which causes damage, scouting may be reduced or the control program postponed. By combining rural weather information with agricultural knowledge, pesticide use can be reduced an estimated 20 percent.

"About 25 percent of the herbicides applied in the U.S. are ineffective because of incorrect timing in relation to weather conditions. The farm value of these herbicides is $10.5 billion. Assuming only a 10 percent improvement in herbicide efficiency, the agricultural weather program would be worth $2.6 billion to the nation's farmers.

"The farm value of pesticides – insecticides, bactericides, fungicides, nematocides and the like – is $7 billion. Researchers estimate a 20 percent reduction is possible from a fully implemented agricultural weather program to support efforts in integrated pest management. Assuming results are half effective, the farmer's pesticide bill would be reduced by $1.4 billion nationwide.

"Irrigation is a critical component in the nation's agriculture. Research shows irrigation efficiency can be improved by some 35 percent through use of rural weather data in irrigation scheduling. Assuming this to be true for 10 states, it represents a savings of $420 million annually.

"When a crop matures is closely tied to weather. Localized weather information can be used to predict when a crop will reach maximum quality. This information, in addition to its value to farmers, can be used in scheduling processing operations."

After recording observations, recruited volunteers would call a toll-free number provided by National Weather Service and send data directly to a NWS computer by using a touch-tone pad. "Keying in an observation takes less than a minute," Suchman said.

Volunteers also would make special calls when they believe they have something significant to report – particularly for short-term forecasts, Suchman said.

The "Green Thumb" box cos about $100 and can either be pu chased or leased by farmer One set of wires will connect the antenna terminals of th home television receiver and th other will plug into the telephon line. "In effect, this will turn th television receiver into a com puter terminal. The show woul bypass commercial TV broad casters.

"To assess the disseminatio system, the farmer will call special number at his local cou ty Extension agent's office an be connected to a small com puter. He will then choose up t eight screensful of informatio from some 300 which will be available.

"The information will be loaded at high speed into a memory system in the Green Thumb box. At this point, the telephone communication will be terminated and the farmer can view the information at his convenience. If he wants another set of information, he will have to call t county computer again Suchman explained.

The concept, which has t backing of U.S. Agricultu Secretary Bob Bergland, al will be displayed Sept. 15-16 the Vernon County Fair and Farm Progress Days Oct. 9-1 Suchman said.

Manitowoc Herald-Times-Reporter

AUG 19 1979

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Denmark Press

AUG 16 1979

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"Project Green Thumb" Demonstrations Set

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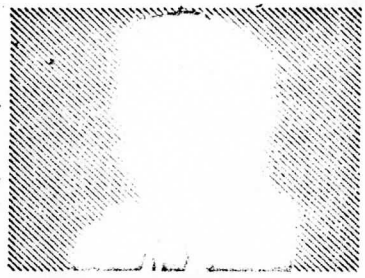
Wis. State Farmer, Waupaca

(Madison) Wisconsin State Journal, Sept. 30, 1979



By Robert C. Bjorklund

serve grand champions for $80 a head to Crouch Hogs Farms, Richland Center.

Carl Hirschinger said 43 pens of feeders were exhibited at the show.

His review of the feeder pig market showed the number of feeder pigs was reduced after a sell-off of sows because of low prices. But now sow sales have been cut back and with feeder pig numbers increasing there will be depressed prices for some time.

The growing problem is that there will be more Wisconsin hogs ready for market than there are markets to take them.

TV-computer hookup

First reports on using the home television set as a computer terminal to provide current weather developments and forecasts and updated market reports for farmers show that 90 percent of the people who have seen the system demonstrated would like to use it — and are willing to pay a fee to use the system.

The system is called Project Green Thumb and is being investigated by the National Oceanographic and Atmospheric Administration to see if it can be used to keep farmers abreast of those developments that affect their businesses.

If a farmer wants weather information, he uses his telephone to call his county extension office, enters a code number and the computer will return the latest state and country forecasts. To make the system work, it will be necessary to lease or purchase a special electronic box, which holds the information for display on an unused television channel.

He also may receive local weather observations and a radar picture showing how storms are moving in the area and the precipitation and intensity of the weather.

David Suchman, researcher with the University of Wisconsin-Madison Space Science and Engineering Center, demonstrated the system at four county fairs, including Dane and Vernon counties. The Wisconsin demonstration and survey will be continued at the Wisconsin Farm Progress Days Oct. 9-11 at the Mueller and James Farms, Montfort.

Two big shows

We are about to enter the biggest two weeks for agriculture Wisconsin has ever seen.

More than 200,000 visitors are expected in Dane and Iowa counties for two spectacular programs telling what is happening on our farms and those of the world.

World Dairy Expo starts it off on Wednesday at the Dane County Exposition Center where the program continues through Sunday, Oct. 7, and Wisconsin Farm Progress Days at Montfort will continue the farm emphasis from Oct. 9 to 11.

B. INDIVIDUAL QUESTIONNAIRE RESULTS

The questionnaire responses, for each of the demonstrations follow. The responses are divided into those by farmers and non-farmers for ease in statistical analysis. Relevant comments are included; ambiguous answers were not tabulated.

set #1 - Dare County

PROJECT GREEN THUMB

62 questionaires reviewe

FARMER	YES	NO
	60	none
OWN LAND	45	12

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	9	2	13	33	3

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	29	26	2	none

	- 20	20-35	35-50	50+
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	41	11	2	1

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	44	24	17	12	6	4	none	none	12

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	54	46	8	12	6	none	none	53	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	6	13	11	5	5	5	5	6

	YES	NO
WOULD USE A GREEN THUMB BOX	51	5
SIZE & SHAPE IMPORTANT	10	44

COMMENTS

1) Prefer compact size.
2) Reasonably priced.
3) Preference for size domonstated.
4) Audial reception.
5) Not complicated.
6) No larger than 5*7.
7) Automatic alarm system for weather emergencies.

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	56	53	53	21	24	18	33
DATA NOT RECEIVED	11	16	14	16	17	17	19
DATA CONSIDER IRRELEVANT	none	none	none	none	1	2	1

COMMENTS

1) Add local markets:hay,livestock,vegetables,fruit,trees,oats.
2) Dairy&livestock rations.
3) New diseases & health problems.
4) Accurate forecasts.
5) Weekly updates:production & pest problems.
6) Ways of contacting other growers.
7) U.S.D.A. bulletins.
8) Homemaker project meetings.
9) Accomadation of additional information.

set #2-Racine PROJECT GREEN THUMB 21 questionnaires revie 1

FARMER	YES	NO
	21	none
OWN LAND	15	6

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	3	3	5	6	2

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	8	11	1	none

	-20	20-35	35-50	50+
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	12	8	none	none

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	7	6	8	8	8	1	none	none	2

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	15	6	3	9	8	1	none	8	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	2	7	1	2	2	4	2	1

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	18	17	19	8	5	6	7
DATA NOT RECEIVED	2	7	3	5	2	2	4
DATA CONSIDER IRRELEVANT	none	none	none	1	none	2	1
COMMENTS	(1) Insect control information. (2) Long range weather&market predictions. (3) Emergency routes for evacuation in disasters.						

	YES	NO
WOULD USE A GREEN THUMB BOX	20	1
SIZE & SHAPE IMPORTANT	none	15
COMMENTS	This program is not worth pursuing because the current methods of fulfilling farmers'needs are satisfactory.	

FARMER	YES	NO
	37	none
OWN LAND	35	2

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	7	3	11	12	2

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	21	11	7	1

	-20	20-35	35-50	50+
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	26	12	none	none

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	23	10	7	6	4	2	none	none	8

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	27	24	none	none	2	2	none	30	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	4	4	4	3	5	3	5	4

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	39	32	32	4	17	10	21
DATA NOT RECEIVED	10	15	13	8	12	5	11
DATA CONSIDER IRRELEVANT	none	none	none	4	none	none	none
COMMENTS	(1) Information on health programs. (2) Milk marketing and pricing. (3) Local and state grain markets. (4) Comparison prices for markets. (5) Extended weather forecasts. (6) Weather conditions for flying & boating. (7) Legislature bills in State and Federal committees-information &explanation.						

	YES	NO
WOULD USE A GREEN THUMB BOX	37	1
SIZE & SHAPE IMPORTANT	4	31
COMMENTS	General preference for display size and/or compactness.	

PROJECT GREEN THUMB

set#4-Viroqua

78 questionnaires reviewed

FARMER	YES	NO
	78	none
OWN LAND	66	9

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	5	15	22	27	9

MAX (in $$) EXPENDITURE ON BOX	-100	100-200	200-300	300+
	46	22	7	1

MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	-20	20-35	35-50	50+
	60	11	5	1

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	54	19	15	13	5	6	2	1	10

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	73	56	34	7	1	none	2	71	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHE
VEGETABLES	15	17	11	9	11	10	11	12

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	68	62	67	14	36	20	44
DATA NOT RECEIVED	13	26	20	24	24	22	29
DATA CONSIDER IRRELEVANT	none	none	1 (local)	7	3	none	none
COMMENTS	See back						

(1) Emergency phone numbers.
(2) Local school reports.
(3) Road conditions and closings.
(4) Dairy markets.
(5) World news.
(6) Political policies.
(7) Bills,amendments,import/exports affecting agriculture.
(8) Homemaking information.
(9) Tax information.
(10) Mental health information.
(11) Spraying directions.
(12) Hazardous chemical spills.
(13) Chemical dispersal phone #.
(14) Radiation background.
(15) Smog allerts.
(16) Combination with channel 27 special weather operation.
(17) Cultural events.
(18) Local markets.
(19) Automobile information and prices of gas(current and future).
(20) National dairy information.
(21) Ozone contamination.
(22) Availability of ration balancing.
(23) Testing averages.
(24) % of curing weather for hay.
(25) Degree days.
(26) Aviation weather.
(27) National and international events.

	YES	NO
WOULD USE A GREEN THUMB BOX	64	7
SIZE & SHAPE IMPORTANT	7	53
COMMENTS	(1) Compact. (2) Individual charge.(In case of damage.) (3) Small enough to be concealed. (4) Portable. (5) Inconspicuous. (6) Large buttons. (7) Should include as many features as possible-to increase demand for Box.	

PROJECT GREEN THUMB

set #5-Iowa: Farm Progress Days

112 questionnaires reviewed

FARMER	YES	NO
	112	none
OWN LAND	74	34

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	11	3	26	44	22

MAX (in $$) EXPENDITURE ON BOX	-100	100-200	200-300	300+
	56	44	6	3

MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	-20	20-35	35-50	50+
	74	30	2	1

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	73	47	46	14	6	9	2	none	14

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	105	82	8	20	11	2	3	97	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	16	25	15	9	11	11	15	11

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	106	88	96	20	37	30	55
)ATA NOT RECEIVED	27	34	33	28	33	24	38
)ATA CONSIDER IRRELEVANT	none	none	1	6	3	5	2
COMMENTS	see back						

(1) Stock market reports.
(2) Area auctions.
(3) Area problems.
(4) Future weather predictions from combinations of past weather facts.
(5) Health lines.
(6) Prayer for the Day.
(7) Listings of all commodities and effects on their markets.
(8) Local deaths.
(9) Import/Export information.
(10) Agricultural trips and shows.
(11) Animal foods.
(12) Nutrition information.
(13) Conputer hookup to all information available:history,economics etc.
(14) Outdoor and recreational news.
(15) Updated data from Dairy Science Information.
(16) DHIA Feeding programs.
(17) Herd health information.
(18) Major news and headlines of the day.
(19) Sports scores.
(20) Interest rates and advice.
(21) School and church activities.

	YES	NO
WOULD USE A GREEN THUMB BOX	102	8
SIZE & SHAPE IMPORTANT	10	88

COMMENTS

(1) Inexpensive.
(2) Compact.
(3) Easily worked.
(4) Capability with interphasing with an on farm computer.

PROJECT GREEN THUMB

set #1

53 questionaires reviewed

FARMER	YES	NO
	none	53
OWN LAND	5	32

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	3	none	2	2	none

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	30	17	2	1

	- 20	20-35	35-50	50+
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	39	9	none	none

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	none	1	none	none	none	1	none	none	2

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	2	none	none	1	none	none	none	none	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	1	2	2	2	3	3	2	2

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	46	16	22	21	23	6	21
DATA NOT RECEIVED	12	15	13	13	18	12	17
DATA CONSIDER IRRELEVANT	none	none	none	1	none	2	none

COMMENTS

1) Crop forecasts.
2) Export data.
3) Other markets.
4) Hearings (i.e. Wetland Hearings).
5) State legislature bills pending.
6) N.Y. Stock Market information.
7) New technology.
8) Road conditions.
9) Medical & veterinary facilities.
10) Local events.

	YES	NO
WOULD USE A GREEN THUMB BOX	36	12
SIZE & SHAPE IMPORTANT	13	20

COMMENTS

1) Should be available to city dwellers.
2) Should be able to accomadate new channels for additional service in the future.
3) Compact.
4) Preference for size demonstrated.
5) Should be available from T.V. dealers,and coordinated with cable T.V.
6) Should have larger data base for non-agricultural applications.
7) Negative opinion: The information offered is already available through media and agricultural agents. The box is superfluous and constitutes an additional expense to taxpayers.

PROJECT GREEN THUMB

set#2-Racine

46 questionnaires reviewed

FARMER	YES	NO
	none	46
OWN LAND	1	40

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	8	none	none	none	none

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	27	19	2	none

	-20	20-35	35-50	50+
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	35	11	none	none

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	none	3	none	none	none	8	4	none	9

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	3	none	none	none	none	none	none	5	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	5	6	6	6	7	5	8	9

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	45	21	23	20	15	13	23
DATA NOT RECEIVED	11	13	16	15	14	18	16
DATA CONSIDER IRRELEVANT	none	none	none	none	none	4	none

COMMENTS

(1) Road conditions.

(2) Congressional and state representative voting record.

(3) News items.

(4) Home message service.

(5) Travel information.

(6) Recreational information.

(7) Stock exchange listings for local and major companies.

(8) Crop budgets.

(9) State statistical reports.

	YES	NO
WOULD USE A GREEN THUMB BOX	44	1
SIZE & SHAPE IMPORTANT	5	28
COMMENTS	(1) Compactness. (2) Should contain listing of library facilities. (3) Touch keys.	

set#3- Manitowoc

PROJECT GREEN THUMB

60 questionnaires review

FARMER	YES	NO
	none	57
OWN LAND	12	29

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	10	1	none	none	none

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	27	27	none	3

	-20	20-35	35-50	50+
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	37	18	2	1

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	none	1	none	none	1	4	none	none	3

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	6	2	1	1	1	1	1	2	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	7	8	7	5	7	7	9	7

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	55	19	21	15	23	4	26
DATA NOT RECEIVED	12	15	18	22	20	14	23
DATA CONSIDER IRRELEVANT	none	none	none	2	1	1	none

COMMENTS

(1) Local news and events.
(2) Stock market reports.
(3) Traffic reports and road conditions.
(4) Library information.
(5) School programs.
(6) Send/receive and copy capabilities.
(7) Short ag classes.
(8) More prompting on bottom of screen.
(9) Expanded list of meetings.
(10) Lake conditions.
(11) National weather.
(12) Gas shortage reports.
(13) Weather forecasts for aviators.

	YES	NO
WOULD USE A GREEN THUMB BOX	47	9
SIZE & SHAPE IMPORTANT	6 Attn: Only 52 (out of 60) were surveyed for this question: 8 questionnaires had the last page missing.	30
COMMENTS	(1) Adaptibility to personal use. (2) Expansion to small bussiness and private use. (3) Transmission of data through regular channel-not Box. (4) Preference for demo size and/or compact.	

PROJECT GREEN THUMB

set #4-Viroqua

54 questionnaires reviewed

FARMER	YES	NO
	none	52
OWN LAND	2	36

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	2	2	1	none	none

MAX (in $$) EXPENDITURE ON BOX	-100	100-200	200-300	300+
	35	18	none	none

MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	-20	20-35	35-50	50+
	35	15	none	none

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	2	2	1	none	none	2	none	none	3

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	3	1	1	none	1	none	none	3	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	4	8	6	4	6	5	8	8

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	50	19	20	21	27	8	27
DATA NOT RECEIVED	10	12	7	16	16	7	20
DATA CONSIDER IRRELEVANT	none	none	none	4	none	1	none
COMMENTS	See back						

(1)Weather information on outside areas.

(2)Pilot weather reporting service.

(3)Radar range and sectional or U.S. weather maps.

(4)Stock market listings.

(5)Local activities.

(6)Church information.

(7)School classes and extracurricular activities.

(8)Local government meetings and dates.

(9)Possibility of broadcasting with cable T.V.

(10)Consumer information.

(11)Road conditions.

(12)Local news

(13)Help lines.

(14)Income tax information.

(15)Educational aids.

(16)Legislative action.

(17)Computerized list of business services available to the public.

(18)Sports summary.

(19)Time information.

(20)Fishing and hunting information.

	YES	NO
WOULD USE A GREEN THUMB BOX	45	7
SIZE & SHAPE IMPORTANT	2	31

COMMENTS

(1)Mounted on wall.
(2)Compact and pleasant looking.
(3)Possibility of keeping out of sight.
(4)Adaptibility to include any kind of information.
(5)Names and addresses for further information on topics of interest.
(6)Uniformity in size and shape.
(7)Adaptibility to interactive communication.
(8)Adaptibility for use by housewife.

set #5 #4-Iowa (Farm Prog. Days)

PROJECT GREEN THUMB

57 questionnaires reviewed

FARMER	YES	NO
	none	55
OWN LAND	9	34

SIZE (acres) OF FARMING AREA	1-49	50-99	100-199	200-499	500+
	4	1	3	3	1

	-100	100-200	200-300	300+
MAX (in $$) EXPENDITURE ON BOX	29	24	5	none

	-20	20-35	35-50	50+
MAX (in $$) EXPENDITURE ON MONTHLY DATA SERVICE	37	14	3	none

	DAIRY COWS	BEEF CATTLE	HOGS	POULTRY	EGGS	APPLES	CHERRIES	CRANBERRIES	OTHER
LIVESTOCK & PRODUCE	6	5	5	5	3	6	none	none	7

	CORN	OATS	TOBACCO	SOYBEANS	WHEAT	BARLEY	RYE	HAY	OTHER
GRAIN	11	6	1	1	2	none	none	10	none

	POTATOES	SWEET CORN	GREEN PEAS	SNAP BEANS	CUCUMBER	CABBAGE	CARROTS	OTHER
VEGETABLES	6	10	9	9	10	9	10	8

	WEATHER INFORMATION	AGRICULTURAL ADVICE	MARKETS	WORLD CLIMATOLOGICAL DATA	MEETINGS	4-H INFORMATION	EXTENTION BULLETINS
RELEVANT DATA	55	33	35	19	29	17	29
)ATA NOT ?ECEIVED	12	20	18	19	23	15	17
)ATA CONSIDER ?RRELEVANT	none	none	none	3	none	1	none
:OMMENTS	see back						

(1) Machinery equipment costs.
(2) List of wholesalers to provide information on feed costs,nutrition and materials.
(3) List of parts houses (for tractors,etc.)
(4) Homemakers advice.
(5) Road conditions.
(6) Outdoor report on hunting,camping,fishing,hiking,etc.
(7) Environmental information.
(8) Late blight prediction programs.
(9)Other predictive models for specific diseases and crops.
(10) Pest control information.
(11) Accounting system.
(12) Chemical, fertilizing and planting advice.
(13) Details about food price specials.
(14) Recipes.

	YES	NO
WOULD USE A GREEN THUMB BOX	52	5
SIZE & SHAPE IMPORTANT	11	33
COMMENTS	(1) Easily concealed. (2) Compact. (3) Easy to use. (4) Possible wall mount.(Conserve space,less damage.) (5) Easily placeable.	

APPENDIX C.

DESIGN REPORT ON TECHNICAL IMPLEMENTATION OF PROJECT GREEN THUMB

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Project Goal

The goal of this project is to develop the hardware and software necessary for a reasonable simulation of a proposed GREEN THUMB system. The GREEN THUMB system, as proposed, is an information retrevial network the user portion of which consist of a data terminal connected over standard phone lines with a computer managed weather information data base. This user device would also connect to the users home television receiver where it would display the data requested.

Overview

The system as implemented consists of two Apple computers and their associated peripherals linked over voice grade phone lines by Bell 103 standard modems. One of the Apple computers acts as a data Entry and Formater Computer (EFC) while the other functions as a data Retreval and display Driver Computer (RDC). The Apple computer is used because it is, at this time, the only readily available system with color graphics capability that can be easily coupled to a standard color receiver through the antenna terminals.

Data Entry and Formater Computer

Hardware:

The EFC hardware consists of an Apple computer with the following major peripherals:

1) 48K bytes of random access memory
2) Floppy disk drive
3) Serial output port
4) 25 inch color television monitor
5) Bell 103 modem with FCC approved coupler
6) BASIC programming language in Read Only Memory

7) Joy stick control for graphics entry

Software:

The EFC software is written in BASIC, the interpreter for which resides in the optional Read Only Memory (ROM) card. This ROM card is used rather than the Random Access Memory (RAM) version of the same software package so that video display RAM areas can be freed up. Most of the programs are optimized for operating speed rather than size or readability. Comments are kept to a minimum because of the storage constraints of the small floppy disk drives.

All main programs are menu driven and file oriented. They break down into the following categories:

1) Editing (both text and graphics)

2) File inspection

3) File transmission

The file editor is the heart of the EFC unit. This program is used to edit and inspect both text and graphics files. The editor is written as a screen oriented package which operates on files existing on the floppy disk.

A file inspection program is included in the EFC system so that the data files may be examined in the same way they are accessed at the remote RDC unit. The only difference between this program and the master program of the RDC is that menu selection input is from the computer keyboard rather than a separate GREEN THUMB box.

File transmission is handled by a series of programs which set the phone number of the RDC and do dial up and transmission control.

Operation:

On power up the system enters the subprogram selection menu phase. From this point all normal system functions can be accessed by choosing the number of the desired function from a menu on the screen. After completion of the desired function all subprograms return to this phase.

The program most often accessed is the file editor. On entry this program asks for the name of an existing file to be edited. If no data has been entered into this file a blank screen is presented to the user. The graphics or text data desired may be entered at this time. See appendix A for a list of editor control characters. Text and graphics pages may be interleaved as required by the data. The number of pages which may be entered is limited only by the amount of disk storage space left.

If the file to be edited contains data, either text or graphics, the first page is displayed on the screen. Existing text files may be altered in the same way as they are originally edited into the system. The contents of graphics pages, on the other hand, may not be altered. The only option available for an existing graphics page is to delete or retain. This question is indicated at the bottom of the graphics on the screen and the user may respond accordingly.

The graphics editing subprogram presents a limited number of map outlines for the user. In the system as it exists these maps are developed by hand using the data representation system as described in the BASIC manual provided with the computer. Please consult that manual for further details.

At the end of the editing sequence the user is asked if the file just edited should be placed in the list of files to be transmitted to the RDC. If the user answers yes, the file will be transmitted the next time the

transmission phase is entered.

The user may inspect any file by entering the edit mode. It is faster, however, to use the file inspection facilities of the EFC. This subprogram will display the menu oriented files as they will be accessed at the RDC. In this way the user can see the data being displayed as the user of the RDC will see it. To exit this mode and return to subprogram selection phase the user must type a control "E".

Files may be transmitted as soon as they are edited or transmission may be delayed until a number of files are ready. File transmission is handled automatically by the system. The phone number of the RDC is dialed, connection is established and the files are transmitted. If an error in transmission is detected the connection is terminated and the system retrys to send the file which had the error.

Data Retrieval and Display Driver Computer

Hardware:

The RDC hardware consists of an Apple computer with the following major peripherals:

1) 48K bytes of random access memory
2) Floppy disk drive
3) 25 inch color television monitor
4) Bell 103 modem with FCC approved coupler
5) BASIC programming language in Read Only Memory
6) GREEN THUMB simulation box

Software:

The RDC software is written in BASIC and the same general comments apply to this software as to the ERC software.

All main programs are menu driven and file oriented. They break down into the following catagories:

1) File display

2) File reception

The main program in the RDC is the file display handler. It does the processing necessary to simulate the GREEN THUMB box.

The file reception program is called in to communicate with the EFC when necessary.

Operation:

On power up the system enters the file display handler program. This is the main control program of the RDC system. It displays the menus and menu selected data to the user. While running under this program the system accepts input from the user thru the GREEN THUMB simulation box. It is not necessary to have the computer accessible to the user at this time.

All of the data presented to the user is taken from the floppy desk. In this respect the system differs from the proposed GREEN THUMB system.

When a ring is detected on the phone line, control is transfered to the file receiver program. This program is responsible for communicating with the transmission program of the EFC. It answers the phone and then establishes connection with the EFC. It receives the files transmitted to the RDC and replaces the corresponding disk files with the updated files received. It also does error checking and if an error is detected the connection is terminated and control is returned to the display handler. After all files are received control is passed to the display handler.

Conclusion

The use of the EFC and RDC provides a simulation device which can be used to demonstrate the features of the proposed GREEN THUMB system on a limited basis. From the end users perspective, operation of the system is very much like that of the proposed system.

JOYSTICK CONTROLS

1 SET STARTING POINT FOR LINE
2 DRAW FROM LAST POINT TO PRESENT LOCATION
3 DRAW FROM PRESENT LOCATION TO FIRST POINT OF FIGURE (CLOSE THE FIGURE)

NOTE: ^ indicates that the control key is to be pressed at the same time as the indicated character.

CONTROL CHARACTERS USED BY THE EDITOR

TEXT MODE

^U CURSOR UP 1 LINE
^N CURSOR DOWN 1 LINE
^J CURSOR RIGHT 1 SPACE
^H CURSOR LEFT 1 SPACE

^G CURSOR TO BEGINNING OF PRESENT LINE
^Y CURSOR TO TOP OF PAGE

^Z ERASE FROM CURSOR TO END OF LINE
^X ERASE FROM CURSOR TO END OF PAGE

^P GO TO NEXT PAGE
^B GO TO FIRST PAGE OF FILE
^E END EDIT

^I INSERT GRAPHICS PAGE BEFORE PRESENT PAGE
^O INSERT GRAPHICS PAGE AFTER PRESENT PAGE

GRAPHICS MODE

^U CURSOR UP 1 LINE
^N CURSOR DOWN 1 LINE
^J CURSOR RIGHT 1 SPACE
^H CURSOR LEFT 1 SPACE

^G CURSOR TO BEGINNING OF PRESENT LINE
^Y CURSOR TO TOP OF PAGE

^W WRITE GRAPHICS TO DISK - EXIT GRAPHICS MODE
^R RESTART GRAPHICS MODE - ERASE PRESENT GRAPHICS

^T TOGGLE TO/FROM PLOT MODE
^S SWITCH PLOT COLOR

PLOT MODE

^T TOGGLE TO/FROM GRAPHICS MODE
^S SWITCH PLOT COLOR