publications have an impact

M. F. Smith
J. W. Milon

A recent effort in Florida provided the opportunity to evaluate the effects of disseminating informational materials. The focus of the program was to provide information to help growers save energy in citrus production and harvesting. The specific steps implemented were:

1. Needs assessment: A stratified sample of citrus growers in 3 citrus-producing regions in Florida were interviewed shortly after the 1977-78 crop year to determine direct annual energy use for specific production and harvesting practices.
2. Educational intervention: The results of the survey were reported to citrus growers in a 52-page technical report[1] and a 4-page fact sheet[2] that summarized the report and suggested specific practices to reduce energy consumption. The documents were mailed to citrus growers on agent mailing lists.
3. Published information: Information from these two publications appeared in condensed form in popular journals intended for citrus growers and was presented in Extension agent training sessions and grower conferences.
4. Impact evaluation: In fall, 1980, citrus growers were surveyed to determine production and harvesting changes as a measure of the influence of the technical report and fact sheet. These data were used to estimate energy savings resulting from growers using the two publications. This article is a report of the fourth step—impact evaluation.

M. F. Smith: Assistant Professor, Program Evaluation Specialist, Florida Cooperative Extension Service, University of Florida—Gainesville, and *J. W. Milon:* Assistant Professor, Food and Resource Economics Department, University of Florida—Gainesville. Accepted for publication: January, 1982.

Questionnaire Sent

In August, 1980, 713 citrus producers in 7 counties in Florida were sent a 16-item questionnaire and a cover letter explaining the total process and asking for their cooperation. A second letter and form were sent to nonrespondents about a month later. These 2 mailings gave us properly completed questionnaires from 329 citrus producers controlling 510,372 acres (about 60% of the total citrus acreage in Florida).

Results

Among responding producers, 33% indicated that they'd made a big effort to determine where energy might be saved in their operations; 44% reported a medium effort; 15%, a small effort; and 8%, no effort.

Asked what energy conservation changes they'd made or planned to make in the 12-month period following the distribution of the 2 publications, they reported changes and the number of acres affected in 6 major energy use categories: irrigation, freeze protection, spraying, resetting, transportation, and cultivation.[3]

Reported changes represented a total expected industry savings of 285,663[4] barrels of oil. Thirty-two percent of the producers indicated that the publications had influenced them to plan the changes. The savings directly attributable to the publications were estimated to be 81,977 barrels of oil in 1980 and 163,954 in 1981—4.29% of the total oil used by the industry in 1980 and 8.5% in 1981.

The changes were suggested mostly by producers controlling large operations. Of the producers suggesting changes, 70% controlled more than 500 acres; 20%, 100-500 acres; and 10%, less than 100 acres. These figures reflect, somewhat, the fact that more producers from large acreages responded to the questionnaire (Table 1). However, when the number suggesting change is compared to the percentage of the total group in that operation size, a similar observation can be made—a greater percentage of the more-than-500-acres group suggested change than did the less-than-100-acres group (Table 2). The situation was the same for those who indicated they were making a big

Table 1. Frequency of respondents by size of operation.

Size of operation (acres)	Respondents		Acres	
	N	% total	N	% total
Less than 100	98	29.8%	4,040	0.8%
100	82	24.9	21,791	4.3
More than 500	149	45.3	484,541	94.9

Table 2. Producers suggesting change(s) by size of operation.

	Operation size in acres		
	>500	100-500	<100
Percentage of producers in each operation size suggesting one or more changes	28%	22%	13%

effort to determine where energy might be saved in their operations—51% of these controlled more than 500 acres compared to 23% with less than 100 acres.

The cost of energy increased by 300% from 1973 to 1979. Producers were asked the extent that this increase was a problem to their individual operations and to the Florida citrus industry. For individual operations, 74% said it was a *major* problem, 23% a *minor* problem, and 3% *no* problem. Their projections to the citrus industry as a whole showed 91% believed it to be be a *major* problem, 8% a *minor* problem, and less than ½ of 1%, *no* problem.

Conclusions

The following conclusions have been drawn from this survey:

1. The first full year that the reported changes are in effect, the Florida citrus industry will save 15% of its expected annual energy fuel consumption. More than half of these savings (8.58%) will result from changes made by producers who indicated that the technical report and/or fact sheet influenced them to make the changes.

   The actual influence of the data from the energy use survey may have been less or greater than the 8.58% energy savings. The influence could be less if the producers who suggested changes were influenced only by forces and/or information sources other than the Cooperative Extension Service. The influence would be greater if some of the producers who indicated no influence by the publications were in fact affected by information presented in workshops, conferences, popular magazines, or direct Extension agent contact (the impact evaluation only asked about the direct influence of the two publications). The influence would also be greater if the information caused producers to make changes at a later time than covered by the impact survey (more than 12 months after receiving the publications).

This latter point—the possibility of producers being influenced now, but making changes at a later time—is the expected behavior. Changes in the production and harvesting of citrus may require large outputs of dollars—the desire to change may be present, but the capital to implement may not be available for some time.

A second reason for expecting delayed changes arises from research on individual and group adoption behavior.[5] Not all individuals are ready to adopt at any one time—some are at the awareness stage, while others are adopting. Also, within the social groups, there are innovators and early adopters who respond quickly, but the majority tend to lag in making change. These factors, coupled with increasing economic pressures associated with further increases in energy costs, lead us to expect more producers to make changes 18 to 24 months later than was measured 12 months after the distribution of the publications.

The study reported here is an example of Cooperative Extension "in process"—providing information to individuals to enable them **to change. . . .**

---

2. More of the producers (70%) suggesting change were controllers of large operations (more than 500 acres) and a higher percentage of that group (28%) suggested change than did the producers of smaller operations (13%). The same was true for those who indicated that they were making a big effort to determine where energy might be saved—53% of these managed operations greater than 500 acres and 23% had less than 100 acres.

   The incentive to change harvesting and production practices is most likely economic profitability. And, the trend noted here for more producers of large operations to suggest change reinforces the findings of Kivlin and Fliegel[6] who indicate that, in general, economic profitability is more of an incentive for large farmers to adopt change than for small farmers.
3. The number of producers suggesting change was greatest in the highest energy use practices. The technical report documented that the most energy was used on irrigation and cold protection practices.

The practice change survey (impact evaluation) showed these two categories to also have the highest frequency of producers indicating changes. The fact that the most change was tried in the two areas in which the technical report revealed the most energy use could be evidence of the impact of the technical report.

4. More producers perceive the high cost of energy to be a *major* problem to their operations than are making a *big* effort to determine where energy might be saved in their operations—74% said it was a major problem, but *only* 33% reported they'd made a big effort to determine where energy might be saved.

The study reported here is an example of Cooperative Extension "in process"—providing information to indviduals to enable *them* to change. You can't say that all the changes will be attributable to the educational interventions described in this cooperative effort. However, the impact evaluation did show that it was a contributing factor with some producers.

Footnotes

1. J. M. Stanley and others, *Citrus Energy Survey—Use Estimates and Conservation,* Energy Report No. 2 (Gainesville: University of Florida, Cooperative Extension Service, IFAS, 1980).
2. *Citrus Energy Use and Conservation,* Energy Information Fact Sheet #E1-47 (Gainesville: University of Florida, Cooperative Extension Service, IFAS, 1980).
3. Details of specific changes available from authors.
4. One barrel of oil=5.7 x 10^6 BTU.
5. For example, see E. M. Rogers and F. F. Shoemaker, *Communication of Innovations* (New York: The Free Press, 1971).
6. J. F. Kivlin and F. C. Fliegel, "Differential Perceptions of Innovations and Rate of Adoption," *Rural Sociology,* XXXII (March, 1967), 78-91.