

* * * *

A PROCEDURE FOR MEASURING LEVEL OF FARMING PRACTICE*

V. R. Cardozier

University of Maryland

Several studies have been conducted to determine where farmers get their information, to determine the extent to which they have adopted various innovations and improved farming practices (hybrid

*Several agricultural education leaders contributed to the National Young Farmer Study, either as members of the National Research Committee or as state leaders. Dr. R. J. Agan guided the final effort in placing the data on IBM cards. The author was Specialist in Research and Teacher Training in Agricultural Education, U.S. Office of Education when schedules for the 1959-61 pilot programs phase were developed.

corn, for example) and other aspects of the broad question relating to how well farmers farm. But apparently no measure for determining the level of farming practice has been heretofore developed and standardized. This was the conclusion of the National Research Committee in Agricultural Education (affiliated with the American Vocational Association) when it undertook a nationwide study in 1959.

The study was the final phase of the National Young Farmer Study, consisting of trying out in pilot centers throughout the country a composite of procedures and practices for vocational agriculture teachers to use in organizing and conducting young farmer classes. The plan called for conducting the pilot programs two years, July 1, 1959 to June 30, 1961. At the beginning and at the end data were collected, some of a pre- and post-test nature. The Committee wanted to determine, among other things, changes that occurred in the extent to which young farmers enrolled utilized essential farming practices. By "essential" was meant those farming practices which were critical in their farming, i. e., the failure to use them would result in reduced success. This normally meant reduced income, but could be defined in other terms, appropriate to the enterprise.

The Committee discovered that no instrument for measuring this dimension existed, so it undertook the development of one to serve the purpose. It was decided that the measure should be built around 10 critical farming practices. Efforts to identify 10 farming practices which would apply equally well throughout the country proved hopeless. Diversities within states made the task almost as hopeless on a state basis. The procedure finally adopted was to ask each teacher of agriculture participating in the Study to identify 10 farming practices in his community which would apply to almost all farmers in that community which could be termed essential or "critical". These were to be practices which not all farmers would have adopted; use of hybrid corn seed and similar practices which almost all farmers were using were to be excluded.

After the teacher had developed the list, he was instructed to visit each farmer enrolled in his class, and in direct interview to ask the farmer how he performed each practice. The teacher was instructed to follow-up each question with as many additional questions as required for him to gain a thorough understanding of the nature and extent of the farmer's use of each practice. As each practice was described, the teacher evaluated the farmer's reported practice in terms of what he (the teacher) considered ideal use of that practice for that farmer in that situation. Thus, the criterion level was specific for each farm,

and the teacher's subjective judgment was the source of authority for the appropriate criterion level. Based on his judgment, the teacher recorded a rating of the farmer's level of application for each farming practice, as shown in the accompanying illustration

To guide teachers in developing the list of 10 critical practices, two were listed on the form, as shown in the illustration included at the end of this article. It will be noted that these were worded so as to apply to any community. However, teachers were given the option of omitting these two if they chose.

The purpose of the instrument was to produce a "Level of Farming Practices" score which could be used as a basis for measuring change between 1959 and 1961, and also as a basis for comparing relationships between level of farming practices and selected factors. The various ratings were arbitrarily assigned the following numerical values:

E (excellent)	5
VS (very satisfactory)	4
S (satisfactory)	3
LS (Less than satisfactory)	2
U (unsatisfactory)	1

Although no method for validating the scale or procedure seemed suitable, the scale does appear to have value for certain purposes. The self-evident weaknesses of invalidity and unreliability of teacher judgment are, perhaps, less serious when considered in the light of alternatives and the rationale for this approach. Admittedly the teacher of agriculture may not be aware of the "best" use of a given farming practice for a particular farming situation in a given community, but it is assumed that, on the average, the agriculture teacher is most likely to be as able as anyone in that community to make that judgment. Secondly, it is recognized that there is great variation in teachers' judgments of the ratings that should be assigned to a given level of practice. However, this scale was designed not as an absolute measure but primarily to measure change. That is, its primary purpose was to measure changes in farmers' levels of farming practices during the two-year period. It is assumed that any variations in teachers' judgments from the "true" level of a farmer's practices would be consistent over a two-year period, and hence the error would be relatively constant. Thus, even though "error" might be present in the teacher's judgment, the difference in ratings assigned to a given farmer's practices during the two years would be valid.

While it does not "prove" validity, the distribution of "Level of Farming Practice" scores obtained by teachers from 2813 farmers in 1959, shows nearly normal distribution. No farmer received a score of less than 10. None received the perfect score of 50. The distribution is shown in Figure I.

Table I shows the correlation between "Level of Farming Practices" scores and production efficiency. The total N varied in the case of each agricultural enterprise, since the number of farmers producing that enterprise level varied. It is readily apparent that efficiencies in peanut and grain sorghum production correlated lowest with Level of Farming Practice scores, while silage and broiler production correlated highest.

TABLE I
RELATIONSHIP BETWEEN LEVEL OF FARMING PRACTICES AND EFFICIENCY IN FARMING, ENROLLEES IN NATIONAL YOUNG FARMER STUDY PROGRAMS, 1959

Enterprise*	r	Enterprise*	r
Silage	0.77	Feeder hogs, daily gain	0.54
Broilers, gain, lbs./bird/week	0.63	Calves per beef cow	0.53
Oats	0.63	Eggs Per hen	0.53
Hay	0.63	Broilers, % raised	0.51
Lambs per ewe	0.62	Pigs weaned per sow	0.50
Wheat	0.61	Turkey poults, % raised	0.50
Corn	0.59	Fat steers, daily gain	0.46
Baby beef, daily gain	0.58	Pig litters, daily gain/litter	0.46
Feeder lambs, daily gain	0.58	Bees, # honey/colony	0.42
Milk, lbs./cow	0.58	Cotton	0.37
Potatoes	0.56	Tobacco	0.35
Wool per sheep	0.55	Peanuts	0.24
		Grain Sorghum	0.23

*Production efficiency of crops measured in yield per acre.

Table II shows the correlation between level of farming practices and other selected factors. Correlation was highest in the cases of investment in land and buildings and in percent of cash farm income from livestock products, principally milk. While all of these r values are significant, it is questionable whether any could be of much use for predictive purposes.

FIGURE 1. LEVEL OF FARMING PRACTICE SCORES AND ENROLLEES IN NATIONAL YOUNG FARMER STUDY, 1959

Number of Enrollees

N = 2813

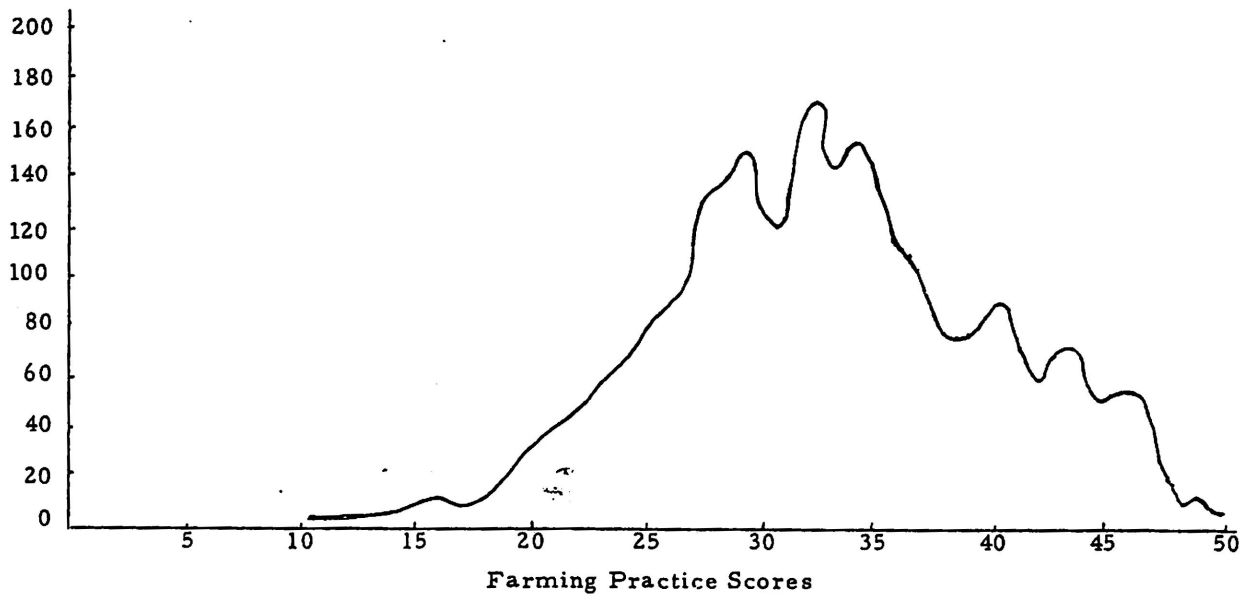


TABLE II
 RELATIONSHIP BETWEEN LEVEL OF FARMING PRACTICES AND
 SELECTED FACTORS OF ENROLLEES IN NATIONAL YOUNG
 FARMER STUDY PROGRAMS, 1959

Factor	r	Factor	r
Investment in land	0.66	Percent of farm cash	
Investment in buildings	0.68	income from:	
Investment in farm mach-		Crops	0.41
inery and equipment	0.58	Livestock	0.56
Investment in livestock	0.60	Livestock products	0.67
Net Worth	0.64	Timber	0.51
Acreage of major cash		Labor income	0.56
crop	0.31	Age of farmer in years	0.56
No. of animals of major			
animal enterprise	0.52		

Management

It might be hypothesized that young farmers with higher scores on the Level of Farming Practices Scale would have had more formal lease or rental arrangements. Examination of data in Table III shows that the distribution of scores was approximately the same among those who had oral agreements, written agreements or written agreements recorded with the county government.

When queried about whether a soil conservation and/or land capability map had been prepared for their farm, 904 answered in the affirmative, 876 said no, and the remainder did not know, or did not respond. Distribution of Level of Farming Practices scores between the yes and no respondents was not significantly different.

Summary

It is not the purpose of this paper to establish predictive validity for the Level of Farming Practice Scale, but merely to present the rationale for the Scale and some evidence of the relationship of scores to selected factors in farming. At this stage, it cannot be regarded as a highly valid procedure for its purpose, nor indeed can its validity be disproved. In view of the difficulty of measuring the dimension concerned, it appears to have some utility. Further study is needed to determine its validity and reliability before it is employed for predictive purposes.

TABLE III
LEVEL OF FARMING PRACTICE SCORES AND TYPE OF LAND RENTAL OR LEASE AGREEMENTS CONTRACTED BY ENROLLEES IN THE NATIONAL YOUNG FARMER STUDY, 1959

Level of farming practice scores	Oral	Written	Written and recorded at courthouse	Other
0 - 10	0	0	0	0
11 - 20	23	17	4	0
21 - 25	91	27	6	2
26 - 30	166	67	11	3
31 - 35	204	91	5	4
36 - 40	118	64	7	2
41 - 45	75	46	6	1
46 - 49	14		0	0

LEVEL OF FARMING PRACTICE SCALE*

This scale is to be completed by a teacher of vocational agriculture (or other professional who is qualified to judge proficiency of performance) of practices in a given community, while interviewing the farmer. Practices chosen should be those that would apply to all of the group involved in a study. Practices which have long since been adapted by all farmers, such as use of hybrid corn, should be avoided.

Two practices, for illustrative purposes, are given in the scale. In interviewing the farmer, the teacher asks how each practice listed in the "Practice" column was carried out last year (or the current year) and after hearing the description, makes a judgment of rating that is to be placed on the farmer's performance. By having the same person conduct the interviews, any error in judgment should be constant.

Practice	E	VS	S	LS	U	NA
	(Check One)					
1. Describe the insect control practices you used last year on your major crop.						
2. Describe how you decided when and how to market your major crop last year.	-	-	-	-	-	-
.	-	-	-	-	-	-
.	-	-	-	-	-	-
10.	-	-	-	-	-	-
Total number check each column	-	-	-	-	-	-

Evaluation: E=excellent; VS=very satisfactory; S=satisfactory; LS=less than satisfactory; U=unsatisfactory; NA=does not apply

*Instructions have been revised since use in the National Young Farmer Study.