DOCUMENT RESUME

ED 115 800 95 CE 005 623

AUTHOR	Byrd, J. Rick; And Others
TITLE	An Empirical Determination of Tasks Essential to Successful Performance as a Commercial Vegetable Producer. Determination of a Common Core of Basic Skills in Agribusiness and Natural Resources.
INSTITUTION	Ohio State Univ., Columbus. Dept. of Agricultural Education.; Ohio State Univ., Columbus. Research Foundation.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
BUREAU NO	V0033VZ
PUB DATE	75
GRANT	OEG-0-74-1716
NOTE	27p.; For an explanation of the project, see CE 005 614-615, and for the other occuations, see CE 005 616-643
EDRS PRICE	MF-$0.76 HC-$1.95 Plus Postage
DESCRIPTORS	Agricultural Education; Agricultural Occupations; *Agricultural Production; Agricultural Skills; *Farmers; Job Analysis; Job Skills; *Occupational Information; Occupational Surveys; Tables (Data); *Task Analysis; Vocational Education
IDENTIFIERS	*Vegetable Producers

ABSTRACT

To improve vocational educational programs in agriculture, occupational information on a common core of basic skills within the occupational area of the commercial vegetable producer is presented in the revised task inventory survey. The purpose of the occupational survey was to identify a common core of basic skills which are performed and are essential for success in the occupation. Objectives were accomplished by constructing an initial task inventory to identify duty areas and task statements for the occupation. The initial task inventory was reviewed by consultants in the field and 283 tasks were identified. A random sample of 84 commercial vegetable producers based on the 1975 directory of the Ohio Vegetable and Potato Growers was otabined. Data were collected utilizing a questionnaire. Forty-three questionnaires were returned of which 37 were usable. A compilation of basic sample background information is presented on the size and kind of commerical vegetable farm, years as a commercial vegetable producer, and preparation as a commercial vegetable producer. A compilation of duty areas of work performed and work essential for the occupation is given. Percentage performance by incumbent workers and the average level of importance of specific task statements are presented in tabular form. (Author/EC)

DETERMINATION OF A COMMON CORE OF BASIC SKILLS IN AGRIBUSINESS AND NATURAL RESOURCES

An Emperical Determination Of Tasks Essential To Successful Performance As A Commercial Vegetable Producer

DEPARTMENT OF AGRICULTURAL EDUCATION

THE OHIO STATE UNIVERSITY

COLUMBUS, OHIO 43210

2

AN EMPERICAL DETERMINATION OF TASKS ESSENTIAL TO SUCCESSFUL PERFORMANCE AS A COMMERCIAL VEGETABLE PRODUCER

J. Rick Byrd

Edgar P. Yoder

J. David McCracken

Department of Agricultural Education

in cooperation with

The Ohio State University Research Foundation

The Ohio State University

Columbus, Ohio

1975

PREPARED AS APPENDIX VII

Of a Final Report

On A Project Conducted Under

Project No. V0033VZ

Grant No. OEG-0-74-1716

This publication was prepared pursuant to a grant with the Office of Education, U.S. Department of Health, Education and Welfare. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Office of Education position or policy.

U.S. Department of Health, Education and Welfare
U.S. Office of Education

FOREWORD

The Department of Agricultural Education at The Ohio State University is involved in a major programmatic effort to improve the curricula in education programs in agriculture. One product in this effort is this report of the commercial vegetable producer task inventory survey. The data reported were collected as part of a more comprehensive thrust designed to develop a common core of basic skills in agribusiness and natural resources.

It is hoped that the revised task inventory contained in this report will be useful to curriculum developers working for improved occupational relevance in schools. Twenty-seven additional inventories in other occupational areas are also reported from this project.

The profession owes its thanks to J. Rick Byrd, graduate research associate, for his work in preparing this report. Special appreciation is also expressed to William A. McNutt, Secretary-Treasurer, Ohio Vegetable and Potato Growers Association, for his input and help in securing the cooperation of commercial vegetable producers across Ohio.

J. David McCracken
Project Director

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Occupational information is needed to develop and revise vocational and technical education curricula. Teachers and curriculum developers generally determine which skills might be taught in a program based upon teacher expertise, advisory committee input, informal and formal community surveys, and/or task inventories.

The Agricultural Education Department at The Ohio State University has utilized and revised a system for obtaining and using occupational information as an effective aid in planning, improving, and updating occupational education curricula. This report presents the results of a survey of the occupation, commercial vegetable producer. The information contained herein may be used by curriculum development specialists, teachers, local and state administrators, and others involved in planning and conducting vocational and technical programs in agriculture.

Purpose and Objectives

The major purpose of the occupational survey was to identify the skills which are performed and essential for success as a commercial vegetable producer. The specific objectives of this survey were as follows:

1. Develop and validate an initial task inventory for the commercial vegetable producer.
2. Identify the specific tasks performed by the commercial vegetable producer.
3. Determine the relative importance of the specific tasks to successful employment as a commercial vegetable producer.

Definition of the Occupational Areas

The commercial vegetable producer receives a major portion of his income from the sale of truck crops. The particular truck crops grown will depend on the locality. The vegetables may be grown for canneries, frozen food processing plants, and for wholesale and retail trade. Some commercial vegetable producers may only grow vegetable crops under glass. The specific duties performed by the commercial vegetable producer will depend on the specific truck crops being grown. In general, the commercial vegetable producer prepares seed beds, plants, cultivates, sprays, dusts, harvests, and markets the truck crops.

The commercial vegetable producer also has a large investment in buildings and equipment. He operates and maintains the machinery and equipment and maintains the buildings and structures.

METHODOLOGY

Objectives were accomplished by constructing an initial task inventory, validating the initial inventory, selecting a sample of workers, collecting data, and analyzing data.

Initial Task Inventory

Duty areas and task statements for the commercial vegetable producer were identified by searching existing task lists, job descriptions, curriculum guides, and reference publications. Additionally, contacts with several commercial vegetable producers aided in clarifying the specific responsibilities of the commercial vegetable producer. All the tasks that the project staff thought to be performed were assembled into one composite list.

The initial tasks were grouped into functional areas called "Duties".

After the task statements were grouped under the proper duty areas, each task statement was reviewed for brevity, clarity, and consistency. In all, 322 task statements were included in the initial task inventory.

Initial Inventory Validation

After the initial task inventory was constructed, it was reviewed by twelve commercial vegetable producers.

The commercial vegetable producers were asked to respond to the initial task list inventory by performing the following activities:

1. Indicate whether any of the tasks listed were not appropriate.
2. Add any additional tasks they believed were performed by the commercial vegetable producer.
3. Make changes in the wording of tasks to help add clarity to the statements.

The comments from the twelve commercial vegetable producers were pooled and needed revisions were made. One new duty area was added as a result of the initial review process. The duty areas relating to the overall management of a commercial vegetable farm which were not unique to the vegetable enterprise but common to several production agriculture occupations were removed from the commercial vegetable producer questionnaire and incorporated into a separate farm manager (owner-operator) questionnaire.

As a result of the initial task inventory review process, 283 tasks were identified.

Worker Sample Selection

An attempt was made to survey commercial vegetable producers with various sizes and types of vegetable production operations. A sample of 84 commercial vegetable producers was obtained from the 1975 directory of the Ohio Vegetable and Potato Growers Association using a stratified random sampling approach. The strata used in the sampling approach were geographic location and type of operation.

Data Collection

A packet of materials was sent to the randomly selected commercial vegetable producers. The packet of materials included:

1. A cover letter from the Ohio Vegetable and Potato Growers Association.
2. A questionnaire printed on yellow.
3. A stamped and self-addressed return envelope.

The commercial vegetable producer was instructed to complete the questionnaire and return it in the stamped and self-addressed return envelope by the date specified in the cover letter.

A follow-up of non-respondents consisted of mailing a packet of materials two weeks after the initial mailing. The follow-up consisted of a packet of materials identical to the initial packet except that a cover letter on Ohio State University stationery replaced the cover letter on Ohio Vegetable and Potato Growers Association stationery.

Data Analysis

The 43 questionnaires which were returned were checked for completeness and accuracy by the project staff. Information from the 37 usable responses was coded on Fortran coding sheets for key punching. In addition to coding appropriate respondent background information, each specific task statement was coded as to whether it was performed (1 = Task performed by respondent; blank = Task not performed by respondent) and the level of importance of the task (3 = Essential; 2 = Useful; 1 = Not Important). The information was keypunched on IBM cards and verified by personnel at the Instruction and Research Computer Center at The Ohio State University.

The data was analyzed using the SOUPAC computer program and the facilities of the Instruction and Research Computer Center. Consultant assistance for analyzing the data was provided by personnel at The Center for Vocational Education. The SOUPAC computer analysis resulted in the computation of relative frequencies, means, and rankings for each task statement. The results of the computer analyses were printed in tabular form for ease of interpretation.

FINDINGS

Objectives of the study resulted in the compilation of basic sample background information, the determination of tasks performed by the commercial vegetable producer, and the identification of tasks essential to successful performance as a commercial vegetable producer.

Description of the Sample

Information regarding the performance of tasks and the importance of the tasks to successful employment as a commercial vegetable producer was obtained from commercial vegetable producers across Ohio.

Response to the Survey

A total of 84 questionnaires were mailed and 43 replies were received. This represented a 51.2% rate of return. The response to the questionnaire is summarized in TABLE I.

TABLE I

PRODUCER RESPONSE TO THE QUESTIONNAIRE

	N	Percent of All Producers In the Survey
Employees in Survey	84	100.0
Total Returns	43	51.2
Usable Returns	37	44.0
Unusable Returns	6	7.2
Nonrespondents	41	48.8

Size and Kind of Commercial Vegetable Farm

Commercial vegetable producers from various size commercial vegetable farms were included in the study. Of the 43 questionnaires received, 37 included information regarding the size of the commercial vegetable farm. TABLE II summarizes the responses to the question, "How many acres do you have in commercial vegetable production?" Fifteen commercial vegetable producers or 40.5% operated farms with 0-100 acres in commercial vegetable production. Six vegetable producers or 16.2% operated farms with

201-300 acres in commercial vegetable production. Six vegetable producers or 16.2% operated farms with 701 or more acres in commercial vegetable production. The number of acres in commercial vegetable production ranged from 4-1600 acres. The mean number of acres in commercial vegetable production per farm was 331 acres.

TABLE II

SIZE OF OPERATION
(Acres in Commercial Vegetable Production)

Acres	N	Percent of Respondents
0-100	15	40.5
101-200	5	13.5
201-300	6	16.2
301-500	1	2.8
501-700	4	10.8
701 or more	6	16.2
Total	37	100.0

$\bar{X}$ number of acres in commercial vegetable production = 331.0

The thirty-seven commercial vegetable producers produced many kinds of vegetables. TABLE III summarizes the responses to the question, "What kind(s) of vegetables do you grow?" Twenty-two vegetable producers or 59.5% raised potatoes. Fourteen vegetable producers or 37.8% raised sweet corn. Twelve vegetable producers or 32.4% raised tomatoes. Eight vegetable producers or 21.6% raised cabbage. Eighteen vegetable producers or 48.6% raised other vegetable crops such as onions, peppers, sugar beets, carrots, radishes, pickles, beans, parsley, celery, and squash. An examination of TABLE III reveals that the thirty-seven vegetable producers responding to the survey often raised several kinds of vegetable crops on their farms.

Years as a Commercial Vegetable Producer

Commercial vegetable producers with varying amounts of experience in vegetable production were included in the study. TABLE IV summarizes the responses to the question, "How many total years have you been a commercial vegetable producer?" Twelve vegetable producers or 33.3% has been a vegetable producer from 21-30 years. Nine vegetable producers or 25% had been a vegetable producer from 11-20 years. Eight vegetable producers or 22%

TABLE III

KIND OF VEGETABLE PRODUCED

Kind of Vegetable	N	Percent of Respondents
Potatoes	22	59.5
Tomatoes	12	32.4
Sweet Corn	14	37.8
Cabbage	8	21.6
Lettuce	5	13.5
Melons	4	10.8
Other	18	48.6

TABLE IV

TOTAL AMOUNT OF WORK EXPERIENCE IN COMMERCIAL VEGETABLE PRODUCTION

Years	N	Percent of Respondents
1-10	8	22.2
11-20	9	25.0
21-30	12	33.3
31-40	3	8.4
41 or more	4	11.1
Total	36	100.0

$\bar{X}$ years as a commercial vegetable producer = 24.0

had been a vegetable producer from one to ten years. The total years as a vegetable producer ranged from 3-70 years with a mean of 24 years.

Preparation as a Commercial Vegetable Producer

Commercial vegetable producers obtained training for their job from various sources. TABLE V summarizes their responses to the question, "Where did you receive your training as a commercial

vegetable producer?" Thirty-five commercial vegetable producers or 94.6% indicated they received training on-the-job. Ten commercial vegetable producers or 27% indicated they attended college and received training in vegetable production. Nine commercial vegetable producers or 24.2% indicated they obtained training in vegetable production by attending adult education courses.

TABLE V

SOURCE OF TRAINING RECEIVED AS A COMMERCIAL VEGETABLE PRODUCER

Source	N	Percent of All Farmers In the Survey
On-The-Job	35	94.6
High School Program	6	16.2
College/University Program	10	27.0
Adult Education Program	9	24.2
Other	4	10.8

Duty Areas of Work Performed by the Commercial Vegetable Producer

The 283 tasks were grouped under 17 duty areas. Each respondent indicated whether he performed the specific task in his current position as a commercial vegetable producer. The percentages of respondents performing each task were averaged for all tasks under each duty area. The mean percentage of commercial vegetable producers who performed specific tasks in specified duty areas is presented in TABLE VI.

Duty areas of work in which 50% or more of the commercial vegetable producers performed the tasks were:

1. Following Legal Regulations in Vegetable Production
2. Following General Safety Precautions
3. Maintaining Equipment and Vehicles
4. Using and Maintaining Hand and Power Tools
5. Testing Soil and Plant Tissues
6. Fertilizing Vegetable Crops
7. Operating Equipment and Vehicles
8. Controlling Diseases and Insects
9. Controlling Weeds

10. Constructing and Maintaining Vegetable Production Buildings and Structures
11. Assembling and Installing Vegetable Production Equipment
12. Establishing Vegetable Crops
13. Marketing and Shipping Vegetable Crops
14. Harvesting Vegetables
15. Storing Vegetable Crops

Duty Areas of Work Essential for Successful Performance as a Commercial Vegetable Producer

A level of importance rating was obtained for each task. The respondent could rate the task as essential, useful, or not important for successful performance as a commercial vegetable producer. A ranking of essential was assigned a numerical rating of "3", useful a numerical rating of "2", and not important a numerical rating of "1". The level of importance ratings for each task were averaged for all tasks under each duty area. The average level of importance ratings for the specific tasks in the specified duty areas are presented in TABLE VI.

Duty areas of work which received a 2.0 or higher level of importance rating by incumbent workers were:

1. Following Legal Regulations in Vegetable Production
2. Following General Safety Precautions
3. Maintaining Equipment and Vehicles
4. Using and Maintaining Hand and Power Tools
5. Testing Soil and Plant Tissues
6. Fertilizing Vegetable Crops
7. Operating Equipment and Vehicles
8. Controlling Diseases and Insects
9. Controlling Weeds
10. Assembling and Installing Vegetable Production Equipment
11. Establishing Vegetable Crops
12. Marketing and Shipping Vegetable Crops
13. Harvesting Vegetables
14. Storing Vegetable Crops

Percentage Performance and Level of Importance Ratings of Specific Tasks

The percentage performance by incumbent workers and the level of importance for each specific task is also presented in TABLE VI.

It is recommended that the results for each specific task be examined by educators and others who are developing educational programs to determine curriculum content for preparing commercial vegetable producers. Specific tasks with a high level of performance and a high level of importance rating should be given more emphasis in the educational program than specific tasks with a low level of performance and a low level of importance rating.

TABLE VI

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE* OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Following Legal Regulations in Vegetable Production		
Follow laws relating to chemical use	94	2.8
Follow laws regarding application of chemicals near specific locations	94	2.8
Identify government regulations regarding marketing of vegetable products	70	2.5
Follow government regulations regarding chemical tolerances and residue build up	83	2.8
Mean Rating	85.3	2.7
Following General Safety Precautions		
Follow safe work habits	94	2.8
Identify potential safety hazards	83	2.7
Store chemicals	91	2.8
Use fire extinguishers	75	2.6
Wear appropriate protective clothing	67	2.4
Ventilate work areas	83	2.6
Interpret information on labels and signs	89	2.8
Use proper lifting and carrying methods	72	2.5
Store inflammable materials	75	2.6
Wear appropriate work clothing	83	2.4
Adjust safety devices	86	2.8
Determine when climatic conditions create unsafe work situations	70	2.3
Correct potential safety hazards	86	2.8
Remove debris from work areas	83	2.6
Use electrical connectors and safety devices	81	2.6
Dispose of chemical containers	80	2.5
Clean up chemical spills	81	2.7
Recognize symptoms of injury or poison from chemicals	70	2.7
Mean Rating	80.5	2.6
Maintaining Equipment and Vehicles		
Add coolant to radiators	78	2.6
Add oil to equipment	91	2.8

*Average rating of importance may range from 1-3 with 3 being the highest

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Adjust carburetors	64	2.2
Adjust clutch pedal free travel	78	2.5
Bleed diesel fuel system	75	2.3
Change oil and oil filters	89	2.7
Change thermostats	67	2.2
Clean debris from equipment	89	2.4
Grease equipment	94	2.8
Inflate tires	94	2.7
Inspect cooling system for leaks	89	2.6
Install and adjust belts	92	2.7
Install and adjust chains	89	2.7
Install and service battery	92	2.7
Interpret maintenance directions in equipment operator's manual	94	2.8
Remove equipment from storage	81	2.4
Repack bearings	86	2.5
Replace and adjust spark plugs	86	2.6
Replace bearings and seals	92	2.2
Replace diesel fuel nozzles	50	2.0
Replace spark plug wires	78	2.4
Replace radiator hoses	84	2.6
Replace universal joints	73	2.4
Service air cleaners	86	2.7
Service fuel strainer, fuel filters, and sediment bowl on fuel system	92	2.7
Time engines	50	2.2
Prepare equipment for storage	92	2.6
Mean Rating	82.4	2.5
Using and Maintaining Hand and Power Tools		
Adjust tools	81	2.4
Clean tools	81	2.4
Identify tools	78	2.1
Interpret tool operation instructions	84	2.4
Recondition tools	60	2.1
Select tools for specific jobs	81	2.5
Sharpen tools	73	2.5
Store tools	81	2.3

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Use hand tools safely	86	2.6
Use power tools safely	86	2.7
Set up tools	71	2.1
Mean Rating	78.4	2.4
Testing Soil and Plant Tissues		
Interpret plant tissue test results	65	2.6
Interpret soil test results and recommendations	78	2.8
Prepare forms to submit with plant tissues	60	2.6
Prepare forms to submit with soil sample	71	2.6
Prepare plant tissues to be submitted to testing laboratories	52	2.4
Prepare soil to be submitted to testing laboratory	73	2.6
Take representative soil sample	76	2.7
Mean Rating	67.9	2.6
Fertilizing Vegetable Crops		
Calculate estimated costs of fertilizer and lime needed	84	2.5
Determine amount of fertilizer and lime to apply	86	2.8
Determine kind of fertilizer and lime to apply	86	2.8
Determine when to apply fertilizer and lime	86	2.7
Evaluate effect leaching and placement have on nutrient availability	59	2.5
Evaluate influence soil pH level has on nutrient availability	67	2.6
Identify functions of lime in crop production	62	2.5
Identify functions of major nutrients in vegetable production	72	2.6
Identify functions of minor nutrients in crop production	56	2.3
Identify nutrient deficiency symptoms in growing plants	64	2.5
Use soil test results	89	2.7
Interpret labels on fertilizer bags	86	2.7
Apply fertilizer in liquid form	62	1.7
Apply fertilizer in dry form	78	2.2
Mix fertilizer solutions	29	2.5
Interpret manufacturer's fertilization rate charts	56	2.1

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Evaluate influence nutrients have on plant growth	72	2.7
Identify specific nutrient requirements for vegetable crops	81	2.7
Select appropriate methods to apply fertilizers	86	2.7
Evaluate factors that influence affectiveness of fertilizers	78	2.6
Adjust rates of fertilizer application for specific conditions	89	2.7
Recognize signs of fertilizer injury	72	2.5
Transfer NH_3 from nurse tank to applicator	29	1.9
Transfer liquid fertilizer from nurse tank	45	2.1
Identify factors which influence fertilizer requirements	70	2.6
Apply fertilizers in gaseous form	40	1.6
Mean Rating	68.6	2.5
Operating Equipment and Vehicles		
Interpret gauge readings on equipment	91	2.8
Operate equipment and vehicles on public highways	91	2.8
Add wheel and front end weights	89	2.4
Adjust equipment safety shields	83	2.7
Connect front end operated equipment	67	2.3
Connect hydraulic systems and hydraulic operated equipment	83	2.6
Correct equipment safety hazards	89	2.8
Connect 3-point hitch equipment	91	2.7
Hitch towed equipment	86	2.7
Identify equipment safety hazards	78	2.5
Install safety shields and devices	83	2.6
Interpret hand operating signals	78	2.4
Interpret safety and operating instructions in operator's manuals	89	2.6
Interpret safety symbols on equipment	91	2.6
Operate equipment under field conditions	91	2.7
Refuel power units	89	2.7
Use appropriate equipment and vehicles for specific jobs	94	2.8
Mean Rating	86.1	2.6

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Controlling Diseases and Insects		
Apply chemicals in liquid form	89	2.8
Apply chemicals in dust form	35	1.8
Apply chemicals through steam system in greenhouses	13	1.1
Determine amount of chemical to apply	89	2.8
Determine when to apply chemicals	94	2.9
Evaluate influence of diseases and insects on vegetable crop production	91	2.9
Evaluate influence of temperature, light, and humidity in greenhouses on disease and insect problems	32	1.8
Evaluate life cycle of insects to determine appropriate control procedures	81	2.6
Identify common vegetable crop diseases	94	2.9
Identify common vegetable crop insects	89	2.9
Identify damage caused by insects and diseases	94	2.9
Identify disease and insect resistant varieties to plant	81	2.7
Identify means by which diseases and insects are spread	86	2.7
Mix chemicals	86	2.6
Select appropriate chemicals to control insects and diseases	91	2.9
Select appropriate method to apply chemicals	91	2.9
Use mechanical and cultural means to control insects and diseases	86	2.5
Inspect areas to determine when infestations require control	91	2.9
Distinguish between harmful and beneficial insects	78	2.7
Contact insect and disease specialists	89	2.6
Interpret chemical labels	97	3.0
Destroy crop residues to control insects and pests	56	2.4
Identify factors which influence chemical effectiveness	81	2.6
Calculate cost of controls	81	2.6
Recognize chemical injury to plants	91	2.8
Select correct field travel and PTO speed for applying chemicals	86	2.9
Calibrate application equipment	89	3.0
Select correct type and size nozzle tips	86	2.9
Adjust applicating equipment	91	2.9
Select proper application pressure	91	2.9
Determine total amount of chemical needed	91	2.9
Mean Rating	81.3	2.7

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Controlling Weeds		
Apply chemicals to control weeds	86	2.8
Evaluate influence weeds have on vegetable crops	81	2.7
Identify common weeds	91	2.8
Inspect fields to determine when weed infestations require control	89	2.7
Evaluate influence cultivation has on yields, soil temperature, and soil moisture	83	2.6
Mean Rating	86.0	2.7
Preparing the Greenhouse Growing Medium		
Determine appropriate soil mix for specific plants	24	1.6
Determine soil texture	24	1.6
Evaluate physical, chemical, and biological effects steam has on soil	16	1.3
Fill benches and pots	21	1.1
Fill soil bins	16	1.0
Identify greenhouse soil materials	21	1.2
Level soil surface	21	1.2
Mark soil for planting	21	1.2
Mix soil with appropriate plant growing materials	24	1.3
Prepare compost	16	1.0
Shred or screen soil	16	1.1
Spread peat moss on top of soil mix	18	1.0
Steam soil	21	1.3
Sterilize mixed soils with chemicals and heat	24	1.2
Mean Rating	20.1	1.2
Constructing and Maintaining Vegetable Production Buildings and Structures		
Apply wood and metal preservatives	54	1.8
Clean and oil electric motors on structures	62	2.2
Clean heating and cooling systems	56	2.1
Build and remove concrete forms	51	1.5
Construct and repair benches and frames	45	1.5

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Determine cost of repairs	48	1.7
Develop bill of materials	40	1.5
Repair and hang gates and doors	51	1.7
Lay concrete blocks	56	1.9
Install electric motors	35	1.4
Mix, pour, finish, and cure concrete	48	1.7
Read and interpret blueprints	32	1.5
Install and repair bracing in buildings and structures	62	1.8
Repair electrical cords and broken wires	78	2.2
Repair minor leaks in roof of buildings	72	2.0
Replace belts and pulleys	67	2.2
Reset circuit breakers	75	2.2
Install and replace electrical switches	70	2.1
Replace fuses	72	2.2
Replace lighting fixtures	67	2.0
Replace plastic coverings on temporary greenhouses	32	1.4
Replace traps in greenhouse heating system and water lines	18	1.3
Replace valves in water system	51	1.6
Replace or repair faucets	59	1.8
Install or replace water pipe	62	1.9
Replace window panes	54	1.8
Wash greenhouse glass	16	1.0
Wire simple electrical circuit	62	2.0
Construct and repair fences and gates	54	1.7
Install and repair wood siding on buildings and storage bins	59	1.7
Repair metal structures with arc or oxy-acetylene welder	51	1.8
Mean Rating	53.5	1.8
Assembling and Installing Vegetable Production Equipment		
Adjust belts on equipment	83	2.5
Adjust chains on equipment	83	2.5
Adjust controls on equipment	83	2.5
Adjust safety shields on equipment	78	2.5
Check for missing equipment parts or hardware	83	2.4
Follow written assembly instructions	81	2.5
Identify hardware	78	2.3
Inspect assembled equipment for operating defects	83	2.3

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Install equipment and structures in proper places	75	2.4
Interpret assembly diagrams	75	2.3
Interpret assembly instructions	75	2.4
Use proper tools and equipment to assemble and install equipment and structures	75	2.2
Mean Rating	79.3	2.4
Managing and Controlling the Greenhouse Environment		
Alter spacing of plants	29	1.3
Apply shading compound to glass	27	1.3
Basin plants for watering	8	1.0
Control air temperature	27	1.5
Control humidity	18	1.4
Control light quantity and quality	18	1.2
Determine appropriate temperatures for various plants	27	1.5
Evaluate affect temperature has on plants	27	1.4
Evaluate influence relative humidity has on plant growth	18	1.4
Hang lath or saran cloth	5	1.0
Interpret light meters	13	1.2
Mist plants	5	1.0
Regulate carbon dioxide generating equipment	5	1.1
Set automatic water timers	5	1.0
Temper water	29	1.5
Water greenhouse plants	13	1.0
Wet greenhouse walks	10	1.1
Set automatic light timers	10	1.1
Mean Rating	16.3	1.2
Establishing Vegetable Crops		
Compact seedbed after seeding	37	1.4
Determine seeding rate	78	2.5
Determine when to seed	75	2.5
Evaluate advantages and disadvantages of various varieties	78	2.4
Identify vegetable plants	78	2.4
Identify vegetable seeds	78	2.4

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Identify problems related to seeding failures	72	2.6
Treat seeds	64	2.2
Interpret information on seed tags	70	2.3
Mulch before or after seeding	45	1.5
Operate seeding or setting equipment	67	2.3
Prepare seedbed	70	2.3
Select appropriate seeding or planting method(s)	81	2.5
Select variety to plant	78	2.5
Determine seeding depth	81	2.6
Cultivate vegetable crops	78	2.4
Evaluate advantages and disadvantages of various planting methods	78	2.4
Determine appropriate spacing	81	2.6
Irrigate vegetable stands	59	1.9
Thin stands	32	1.5
Calibrate planting equipment	62	2.0
Transplant vegetable crops	75	2.4
Mean Rating	69.0	2.3
Marketing and Shipping Vegetable Crops		
Calculate expected returns and profits from sales	75	2.5
Classify vegetables for market purposes	62	2.2
Determine feasibility of participating in vegetable futures market and contracts	45	1.9
Evaluate effect product quality has on value	81	2.6
Inspect vegetables for damage and defects	83	2.6
Load vegetables	81	2.2
Prepare carriers for hauling vegetables	72	2.1
Select markets	67	2.4
Prepare advertising announcements for sale of vegetables	32	1.7
Interpret market reports	70	2.3
Analyze market cycles	51	2.2
Select appropriate marketing system	62	2.3
Select carriers to ship vegetables	54	2.2
Identify various grades of vegetables	70	2.5
Pack and prepackage vegetables	64	2.2
Trim vegetables for market	43	1.6

TABLE VI (Cont.)

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS

TASK STATEMENTS	Percent Performing	Average Level of Importance
Wash vegetables to be marketed	59	2.1
Mean Rating	63.0	2.2
Harvesting Vegetables		
Determine latest dates for harvesting	78	2.4
Determine stage of maturity	86	2.7
Evaluate influence stage of maturity has on quality and value of vegetables	81	2.5
Follow weather forecasts	72	2.3
Determine yield	83	2.4
Determine field harvesting losses	72	2.2
Operate harvesting equipment	86	2.7
Identify harvesting practices which affect product quality	78	2.3
Determine when vegetables should be harvested during the day	83	2.4
Mean Rating	80.0	2.4
Storing Vegetable Crops		
Control humidity and temperature in storage areas	72	2.5
Determine moisture content of vegetables	64	2.0
Estimate amount of vegetables in storage	56	2.1
Estimate amount of storage space needed	59	2.1
Evaluate influence moisture of vegetables has on value and quality of vegetables	59	2.1
Identify storage problems that might occur	72	2.2
Load and unload vegetables	78	1.9
Remove damaged vegetables from storage areas	59	2.2
Cure vegetables prior to storage	45	1.8
Use fans in storage area	81	2.5
Clean storage areas	75	2.4
Check physical condition of vegetables to determine storability	78	2.4
Control light intensity in storage areas	62	2.2
Determine length vegetables may be stored	67	2.4
Mean Rating	66.2	2.2