A PRELIMINARY REPORT TO NACTA

Curriculum Patterns In Higher Education In Agriculture

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Readers, particularly those in the agricultural sector who responded to the 1962 questionnaire inquiry, will note that the data presented in this paper represent only comparatively few of the curriculums originally listed and presently offered in the agricultural colleges. The institutions which reported degrees granted from any agricultural curriculum and the curriculum designations they used when this Office conducted a survey of enrollment and degrees in agriculture in 1960 comprised the source of data for the present study, (1) From the universe of curriculum offerings thus determined for the Land-grant colleges a sampling procedure which provided for two-way stratification, by region and by curriculum, resulted in a population of 419 offerings of 83 differently designated curriculums in 67 institutions. The sample was drawn so as to include every curriculum offered under a different name even though a certain curriculum was offered in only one institution. Those curriculums more generally offered and appearing in many instances were sampled.

For the non-Land-grant colleges the universe was used. This was deemed logical and proper because there were only a few institutions in this group where more than one or two curriculums were offered. This non-Land-grant group added 197 curriculum offferings in 61 institutions.

The total number of questionnaires mailed out was, therefore, 616, to gather data on 83 differently named curriculums being offered in 128 institutions. The return was quite satisfactory: 96 percent from the Land-grant and 85 percent from the non-Land-grant institutions. Table I presents data on the curriculums for which 15 or more reports were received, and Table II shows the number of Land-grant and non-Land-grant institutions represented in the data for each of these 16 curriculums.

In reading Table I showing percentage allocations to the different areas of study, it is to be remembered that the data from the different institutions were arranged in ascending order of the percentage values for the series in each vertical column for each curriculum,i.e., in each cell of the table. It is understood then that only the (M) means can be added horizontally with any significance.

It is also to be noted that the full number of cases reporting for a curriculum was used in the calculation of each item. A zero shown as "L" and/or D1, or even as D5 in any cell simply means that one or more, or perhaps more than half the institutions reporting for the particular curriculum allotted no credit course work to the subject-matter area represented by the column being read.

Certainly the reporting of requirements in the different categories was influenced by the administrative organization in the several institutions. This influence is probably most important in curriculums Agricultural Business, Agricultural Economic, Agricultural Education and Agricultural Engineering. Where these curriculums are in some division other than the School or College of Agriculture, or administered jointly with some other division, the reporting of requirements for the "major field" might have different meanings. The data were tabulated as reported, however, and because the questionnaire form was sent to the Deans and Directors of Resident Instruction in Agriculture it must be assumed that these tabulations represent the "official" agricultural administration interpretation.

When considered in light of the recent recommendation of the Committee on Educational Policy in Agriculture of the National Academy of Sciences, National Research Council, these data present an interesting comparison. That Committee suggested and recommended about a year ago that "as a basis for attaining the status of a Bachelor of Science in Agriculture" . . . a curriculum, when 130 credits are required for graduation, should include:

General Education—65 credits		(50%)
1. Communications —12 credits	(9.2%)	
2. Humanities and Social Science—18 credits	(13.9%)	
3. Mathematics and Statistics—9 credits	(6.9%)	
4. Physical Science —12 credits	(9.2%)	
5. Biological Science —14 credits	(10.8%)	
Major field—26 credits		(20%)
Supporting courses to major field—26 credits		(20%)
Electives—13 credits		(10%)

Table I. Curriculum Patterns in Higher Education

Percentages of total credits necessary for graduation allocated to different areas of study in Agricultural Curriculums in Higher Education; Aggregate United States, 1962.

Curriculum	No. of Cases	Value Symbols*	PERCENT OF CREDITS NECESSARY FOR GRADUATION ALLOCATED TO: AGRICULTURE Total - Major and Supporting Courses	Natural Sciences and Mathematics	Humanities	Social Science	Other Requirements	Phys. Ed. and R.O.T.C.	Electives
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Agricultural Business	25	M	47	18	10	21	1	3	20
		H	55	36	16	42	4	9	44
		D9	52	27	13	37	3	6	32
		D5	26	15	10	21	0	3	21
		D1	15	9	5	9	0	0	7
		L	2	6	5	6	0	0	6
Agricultural Economics	41	M	24	21	10	20	1	4	20
		H	46	42	16	43	5	9	54
		D9	38	30	13	37	2	7	39
		D5	25	21	10	20	0	4	18
		D1	7	13	5	4	0	0	8
		L	0	10	4	2	0	0	6
Agricultural Education	58	M	39	20	10	13	3	4	11
		H	60	36	18	31	19	9	30
		D9	53	28	15	23	6	8	24
		D5	39	20	10	12	2	4	10
		D1	24	13	6	5	0	0	0
		L	16	8	4	2	0	0	0
Agricultural Engineering	21	M	38	32	9	9	0	3	9
		H	57	54	16	24	0	10	19
		D9	[illegible]	50	14	20	0	9	17
		D5	37	29	9	7	0	3	8
		D1	17	21	6	2	0	0	4
		L	16	19	5	2	0	0	0
Agricultural Science	21	M	20	32	12	8	1	4	23
		H	39	49	18	29	4	9	42
		D9	35	46	17	14	2	7	37
		D5	18	32	11	7	0	5	25
		D1	4	20	8	2	0	2	8
		L	2	10	8	2	0	0	6
Agronomy	68	M	29	32	10	10	0	4	15
		H	48	49	23	33	5	11	40
		D9	39	45	15	19	2	8	32
		D5	28	32	9	9	0	4	13
		D1	21	17	5	5	0	0	5
		L	10	12	4	2	0	0	0
Animal Husbandry	51	M	32	27	11	10	1	3	16
		H	52	47	25	27	4	12	33
		D9	[illegible]	37	16	18	2	6	26
		D5	31	28	11	9	0	3	15
		D1	20	17	6	3	0	1	9
		L	13	12	4	2	0	0	5
Dairy Husbandry	23	M	32	26	10	12	1	4	15
		H	51	46	13	26	2	7	32
		D9	42	43	13	24	2	7	26
		D5	31	23	10	11	0	3	16
		D1	23	14	6	6	0	1	4
		L	20	9	6	2	0	0	4
Dairy Manufacturing	19	M	27	27	10	15	0	4	17
		H	34	47	16	33	0	8	27
		D9	34	37	16	28	0	8	26
		D5	27	28	9	12	0	3	16
		D1	20	17	6	5	0	0	7
		L	20	14	5	4	0	0	5
Dairy Science	21	M	29	29	11	10	0	3	18
		H	37	44	15	25	1	8	34
		D9	37	44	15	24	1	8	33
		D5	27	29	11	8	0	3	16
		D1	23	14	4	0	0	1	9
		L	20	14	4	0	0	1	8
Fish & Game and Wildlife	15	M	19	42	13	8	0	4	14
		H	33	64	21	20	0	8	29
		D9	32	59	21	13	0	8	27
		D5	24	41	13	7	0	4	13
		D1	7	17	8	5	0	0	4
		L	7	14	5	2	0	0	2
Forestry	17	M	41	31	10	7	0	3	8
		H	58	48	13	14	0	5	17
		D9	55	47	11	12	0	5	13
		D5	41	30	10	6	0	2	9
		D1	33	20	7	3	0	0	0
		L	26	19	4	2	0	0	0
General Agriculture	62	M	32	24	12	10	1	3	18
		H	53	38	25	32	5	10	53
		D9	45	34	19	16	2	6	35
		D5	31	24	11	9	0	3	16
		D1	21	15	7	5	0	0	3
		L	2	7	5	4	0	0	0
Horticulture	47	M	29	30	10	11	1	3	16
		H	44	56	25	31	4	10	59
		D9	39	44	14	20	2	8	27
		D5	29	30	10	10	0	4	15
		D1	19	17	7	5	0	0	5
		L	2	10	6	2	0	0	1
Poultry Husbandry	33	M	28	28	10	11	1	3	19
		H	55	45	15	31	4	8	54
		D9	40	43	13	20	4	8	29
		D5	28	28	9	10	0	3	17
		D1	17	17	6	3	0	0	5
		L	0	14	5	2	0	0	0
Soil Science	15	M	27	36	8	7	1	2	19
		H	62	54	15	25	7	6	56
		D9	37	50	13	14	2	6	37
		D5	27	41	8	7	0	3	16
		D1	10	21	4	2	0	0	5
		L	10	20	0	0	0	0	2

*Symbols: M - the mean or average of the percentage values in the array under consideration.
L - the lowest percentage value shown in the array; H - the highest percentage value shown in the array.
D1 - the value that best represents the level below which approximately 10 percent of the total number of cases fall when the cases are arranged in ascending order of magnitude.
D5 - the value that best represents the midpoint in the array.
D9 - the value that best represents the level above which approximately 10 percent of the total number of cases fall.

Table II

Number of Land-grant and non-Land-grant institutions reporting for each curriculum shown in previous table.

Curriculum	Land-grant	Non-land-grant
Agricultural business	13	12
Agricultural economics	35	6
Agricultural education	40	18
Agricultural engineering	16	5
Agricultural science	6	15
Agronomy	53	15
Animal husbandry	33	18
Dairy husbandry	17	6
Dairy manufacturing	16	3
Dairy science	21	0
Fish and Game or Wildlife	12	3
Forestry	11	6
General agriculture	31	31
Horticulture	36	11
Poultry husbandry	28	5
Soil science	14	1

While the present data portraying the actual situation as it existed in the field in 1962 show the expected variation among curriculums on account of different objectives and interest, and considerable difference among institutions in the organization of any particular curriculum, it must be noted that the total picture of the average offerings indicates that the developments suggested and recommended by the Committee on Educational Policy in Agriculture are rapidly being met.

Comparisons can be made by taking across-the-board means, i.e., a total of percentages of the work necessary for graduation from all sixteen curriculms in all the institutions represented, divided by the total of the "no. of cases" column. These caluculated unweighted means for the seven columns are:

Natural sciences and mathematics	27%
Humanities	10%
Social science	12%
Other requirements (psychology) (.78)	1%
Agriculture	30%
Electives	16%
Physical education and R.O.T.C.	4%

The Committee of the National Academy of Sciences would have 26.9% of the curriculum allotted to biological science, physical science, and mathematics and statistics. The collected data show 27% to be the practice.

The committee would have 23.1% of the curriculum allotted to communications, humanities and social science. The system by which the data were gathered included "communications" in the humanities category, but this category when taken with the social science shows an overall mean of 22%.

For the area of agriculture and technology the comparison is also quite close. The Committee suggested 20% in the major field, 20% in supporting courses, and 10% in electives. The data show 16% in the major field, 14% in supporting courses, 20% in electives including R.O.T.C. and physical education. The total is the same—50%.

It is to be understood that the column headings in Table I represent only the major headings of the categorization used in the original questionnaire. A subsequent report specialized for agriculture will include the more detailed breakdown following the pattern in which the data were collected.

Natural Science
- Biological
- Physical
- Mathematics & Statistics

Social Science
- Basic
- Applied

Agriculture
- Orientation
- Agricultural Technology
  - (1) in major area
  - (2) supporting in other areas

Humanities
- English
- Communications
- Foreign Language
- Fine & Applied Arts
- Philosophy & Religion

Other Requirements
- (Psychology)

Military Science & Physical Education

Also, in the specialized report the data for Land-grant institutions and for the non-Land-grant institutions will be shown separately.

To whatever extent seems feasible the interpretation of the data in the more detailed report will be explained in terms of the wide variation in organization in the different institutions. This should help readers not thoroughly familiar with current practices in colleges of agriculture to appreciate and understand the nature of this work as a bench-mark survey. In many cases changes have been made since these data were collected, and changes will be made continuously. Comparisons of these data with similar data collected three or five years from now will give evidence to the response of curriculum planners to the rapidly developing technology and the broadening concept of the agricultural industry.

1. "Enrollment and Degrees in Agriculture—Institutions of Higher Education, September 1960." Department of Health, Education and Welfare, OE 56006. Washington, D.C.: Government Printing Office 1961.

News Items

FRESNO STATE COLLEGE . . . A regional meeting of the National Association of Colleges and Teachers of Agriculture will be held at San Luis Obispo, California, on Tuesday, **June 23, 1964.** This meeting has been made possible through the courtesy of the junior colleges who meet annually with the California Agriculture Teachers Association during their summer conference at California State Polytechnic College. The one-day NACTA regional meeting will involve college teachers of agriculture from all the western states. The program will consist of a review of what is being done in the introductory courses in animal husbandry, agricultural mechanics and agronomy.

Washington, D.C. . . . Dr. Henry S. Brunner, Specialist for Agricultural Education, Department of Health, Education and Welfare, Office of Education, Division of Higher Education has started the publication of a news letter entitled, "Instruction in Agriculture, Programs, Activities and Developments." Worthy news items are solicited from NACTA schools and a free copy may be had by sending your name to his office and requesting the newsletter. No regular schedule is planned for publication. The support given by colleges in supplying information for this news letter will be a definite factor in the frequency of its appearance.

Syracuse, N.Y. . . . The following item is quoted from Dr. Brunner's March 1964 Newsletter. "The Climate of Learning" in Higher Education. A Conference to be held at Syracuse University — June 22-23-24. Plans for discussion "in a leisurely setting" include questions such as: What can be done to improve the quality of learning? What do we know about the whole process of teaching and learning on a college or university campus? What kinds of innovations in curriculum and instruction are under way? What implications does this have for use of physical resources? For information write to Professor E. D. Duryea, Chairman, Program in Higher Education, Syracuse University, Syracuse, N.Y. 13210."

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