

Professional Education Advancement Project

Ministry of Education, Culture, Sports, Science and Technology,
FY 2015

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture

Report
(Summary)

March 16, 2016

Tokyo University of Agriculture and Technology

I. Project Overview

1. Aims of the Project

Major transformations are underway in the agricultural sector that led the expansion in food production during Japan's high economic growth era, but we have not necessarily developed a sufficient grasp of the current status of educational systems or social needs in relation to science and technology human resources in the field of agriculture. Based on this awareness and with a view to advancing professional education in science and technology universities and graduate schools, this project involves conducting a survey on the nature of science and technology human resource development in the field of agriculture.

2. Outline of the Project

A. Survey on education-research balance

This survey addresses the topic of balance between education and research in universities and graduate schools. It explores this issue from the perspectives of educational content, students, faculty members and industry in order to shed light on the factors which lead to education-research balance being perceived as a problem.

B. Survey on connecting industry needs to curricular content

This survey of industry needs in relation to university education in science and technology (agriculture) and analysis of curricular content explores the compatibility of university curricula with the needs of industry and other sectors of society.

C. Proposals on methods for verification and evaluation of educational systems

The project considered criteria and methods appropriate for the verification and evaluation of educational systems.

D. Report on approaches to development of science and technology human resources in the field of agriculture

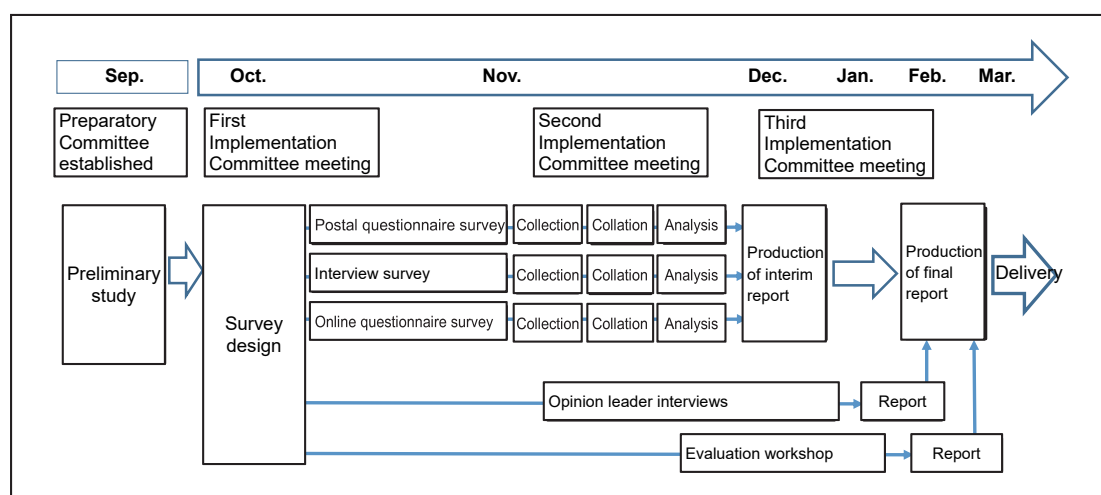
Through wide-ranging, comprehensive analysis of the findings from surveys A and B, the project identifies issues that need to be addressed in educational system reform and reports on key challenges and proposals.

3. Overall Project Plan

(1) Project schedule

The figure below offers an overview of the project. The study was commenced in November. The basic survey was conducted as a postal and online questionnaire. Responses were collected, collated

and analyzed, and an interim report produced in December. In light of these findings, interview surveys and interviews with opinion leaders will be conducted to solicit views on science and technology education in the field of agriculture in a broader perspective. An agriculture education evaluation workshop will be held and the findings of the study brought together into a final report.



Date	Activity
November 1	Finalize contract
November 2	Initiate survey ordering procedures (postal questionnaire, interviews, online questionnaire, opinion leader interviews, survey of universities outside Japan)
November 30	First Implementation Committee meeting (confirming project plan and survey questions)
November 12	Commission surveys commissioned to subcontractor/ commence survey activities
November 23	Complete survey activities
December 10	Submit survey analysis findings Submit interim report
January 26	Second Implementation Committee meeting
February 15	Commence interview survey Complete interview survey
February 25	Deliver educational system evaluation
March 2	Third Implementation Committee meeting / evaluation workshop (domestic)
March 16	Evaluation workshop (international)
March 29	Deliver final report (Japanese/English)

4. Implementation Structure

(1) Implementation Committee

(2) Expert Subcommittees:

Expert Subcommittees corresponding to key agricultural disciplines established within the Implementation Committee provide advice and assistance, and discuss the survey findings.

(3) Regional Subcommittees:

Regional Subcommittees established within the Implementation Committee for each region of Japan provide advice and assistance, and discuss the survey findings.

(4) Secretariat (implementation headquarters):

The Secretariat is established within Tokyo University of Agriculture and Technology.

(5) Universities and institutions to be surveyed:

Institutions participating in the Association of Deans of Agricultural-Related Faculties and Graduate Schools in Japan (74 institutions)

Universities outside Japan: University of California Davis, Cornell University, University of Milan, University of Bonn, Universiti Putra Malaysia, Kasetsart University, China Agricultural University, United Nations Food and Agriculture Organization (Rome), etc.

5. Study Period:

October 1, 2015 to March 31, 2016

II. Principles and Design of the Study

1. Education-Research Balance

In universities today, education and research are usually combined in a holistic way. This practice has its origins in the educational model employed by universities (graduate schools) in 19th-Century Germany, and could be said to be founded on the notion that the expansion and dissemination of knowledge are both exceptionally important endeavors, and that they are best pursued together in the same place and by the same people. Research activity furnishes new additions to human knowledge through discovery and invention, and is a direct means of self-realization for researchers themselves. In contrast, university education involves communicating leading-edge knowledge systems to the next generation, and could be seen as a form of social service. Today, there is a strong tendency to evaluate universities' status on the basis of research outputs (academic publications, research funding, prominent awards and prizes, etc.). It is for this reason that education and research come into conflict in a variety of situations in universities that aspire to integrate the two functions of higher education. In its examination of the balance between education and research, this study engages with the multiple standpoints of universities, faculty members, students, society, and employers (companies, etc.), and the hierarchy of actors including universities, educational organs (departments), and individual faculty members.

Survey method

- Questionnaires were conducted of undergraduate faculties, graduate schools, and departments in 74 universities across Japan, and 1,013 companies and other organizations. There was also an alumni monitor survey and a survey of faculty members in the Tokyo University of Agriculture and Technology Faculty of Agriculture.
- Educational institutions (universities) and educational organs within them (departments) were questioned about “education-research balance.” Responses were solicited exclusively from the senior managers of these organs: faculty and graduate school deans and department heads.
- In order to examine the education-research balance from the standpoint of individual faculty members, questions were included concerning time allocations for educational activities and the balance between education and research. Respondents were asked to indicate their usual teaching workloads, the time they could commit to research, and their administrative workloads. Questions concerning thesis supervision and research lab seminars were also included as these are cases of one-on-one training where research and education are integrated both temporally and spatially.
- Qualities and capabilities to be cultivated through specialist education were itemized as those expected from citizens, employees, technical experts, researchers, and leaders. The educational

contents related to these items were evaluated from the perspective of universities, faculty members, industry, and alumni. Particular attention was paid to field training (including clinical practicum and marine practicum), which are features of agriculture education.

2. Connecting with Industry Needs

The second aim of the study is to comprehend the current status of connections with the needs of industry and wider society. It seeks to gain a full understanding of the needs of industry and wider society, and analyze and verify matters such as the degree to which undergraduate and graduate-level agriculture curricula address those needs, and what kinds of problems may exist in such curricula.

Survey method

- The study surveyed the human resource development needs not only of traditional agriculture-related industries such as agriculture, forestry and fisheries, manufacturing, trading companies, food and processing, national administrative organs, local governments, and research institutes, but also those which in recent years have become rapidly more involved in agriculture as globalization progresses, such as private companies and public organizations in information technology, energy, environmental business, services, and finance, as well as third-sector organizations such as NGOs and NPOs.
- Specialist fields were categorized in accordance with the seven disciplines of agriculture set out in a report of the Science Council of Japan. The items to be surveyed here were also aligned with the survey questions relating to education-research balance.

3. Proposals concerning Methods for Verification and Evaluation of Educational Systems

The appropriateness of the points addressed in this study will be verified, including its awareness of issues surrounding professional human resource development in the field of agriculture. Examples will be provided of useful approaches (targets, techniques, analyses, viewpoints) to developing methods for evaluation and verification of effective educational systems in order for individual universities to implement reforms of their own systems. Trial design and implementation of online classes and dynamic curricular evaluation systems.

4. Report to Inform Human Resource Development in the Field of Agriculture

Building on the findings of the basic survey and sample survey, hearings, interviews with opinion leaders, and domestic and international workshops will be conducted, and important insights, issues, and challenges will be identified to inform the pursuit of educational improvements in the field of agriculture.

III. Findings

1. Environment for Faculty Members engaged in Education and Research

(1) Time allocations to education and research

Data concerning time allocations for education and research were compared across the faculty members' survey and the undergraduate and graduate departmental surveys. There was no great difference across the three surveys in terms of responses to the question gauging agreement to the statement that faculty currently spend more time on research than on education. In each case around 40% of respondents agreed with this statement (Agree and Somewhat Agree responses).

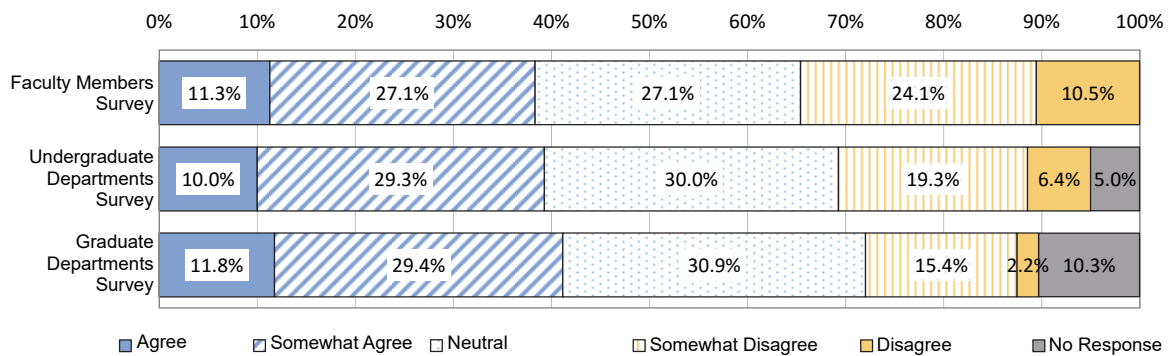


Figure Current Conditions: "Tend to spend more time on research than education"

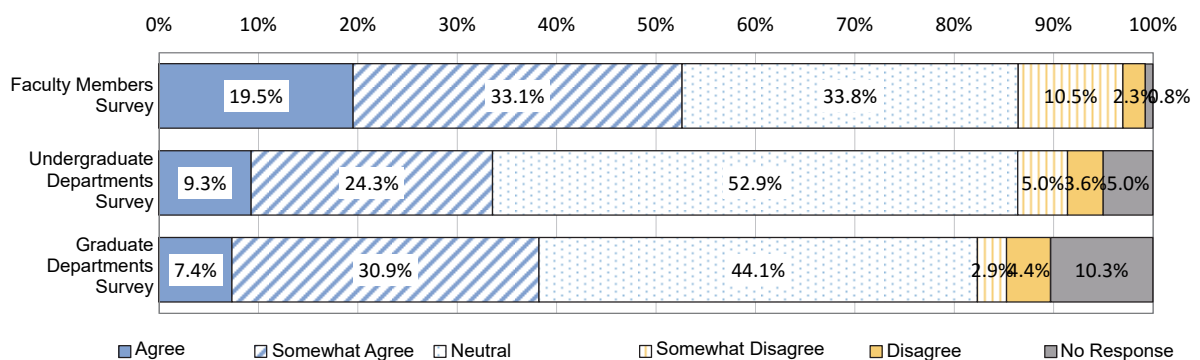


Figure 4 2 Ideal: "Would like to spend more time on research than education"
(faculty members survey)

["I would like faculty to spend more time on research than education" (department dean survey)]

In regard to desired time allocations, more than 50% of faculty members agreed (responded "Agree" or "Somewhat Agree") to the statement "I would like to spend more time on research than education." In contrast, the Agree/Somewhat Agree response rates in the undergraduate and graduate

departmental surveys were 30% and just under 40% respectively. Individual faculty members want to place greater weight on research than they currently do, whereas department heads want to keep placing emphasis on education. This trend is particularly marked in graduate school departments. More than half (51.1%) of faculty members chose Agree in response to the statement “I would like to place more emphasis on research, but my time is taken up with education (including student guidance),” while just 3% of them chose Agree in response to “I would like to place more emphasis on education (including student guidance), but my time is taken up with research.”

In graduate school departments, faculty members hope to spend more time on research, but departmental authorities want to enhance education. This correlates with the identified problems of over-emphasis on thesis research and guidance and demand for enhancement of coursework in graduate schools.

(2) Weighting in faculty member performance evaluation

The performance evaluation of individual faculty members was addressed in the departmental surveys through the statement, “when evaluating the performance of faculty members, we tend to place greater emphasis on research than education.” Around 50% of undergraduate departments agreed with (responded Agree or Somewhat Agree to) this statement. Seen in reverse, this means that 50% are not research-focused. In graduate departments, 60% agreed with the statement, indicating an emphasis on research 10% greater than in undergraduate departments.

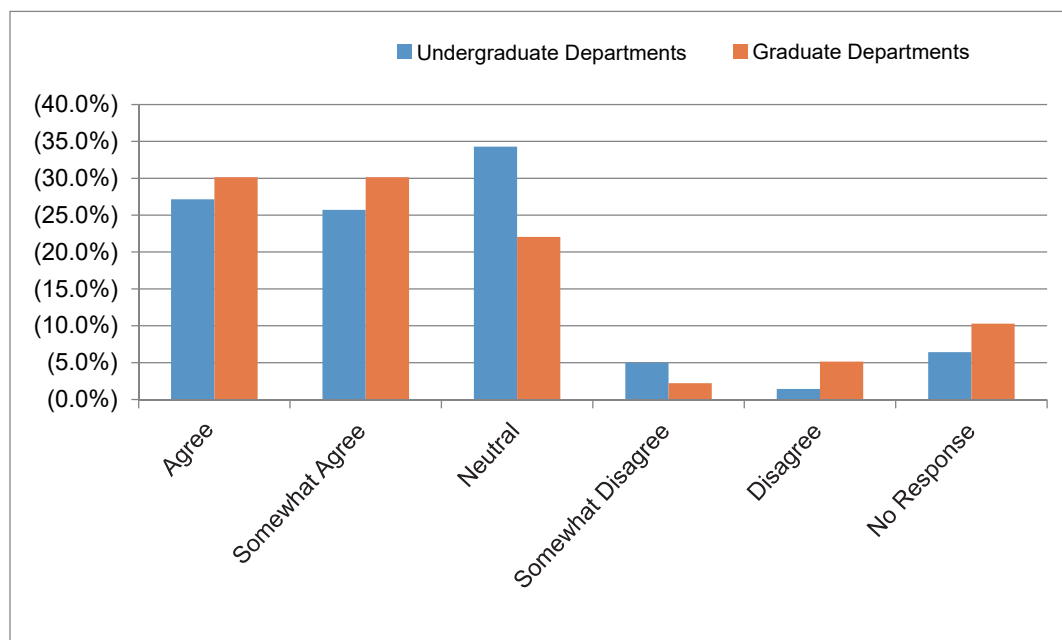


Figure When evaluating the performance of faculty members, we tend to place greater emphasis on research than education
(Research-education balance in performance evaluation)

(3) Expansion in administrative work

In the faculty members survey, 60.2% of respondents agreed (responded Agree or Somewhat Agree) to the statement, “I would like to place more emphasis on education and/or research, but my time is taken up with university administration (meetings, internal/external duties), university events, etc.” An extremely high number of comments in the open response field similarly concerned the large burden of work in areas other than education and research, such as: “I have extremely many meetings and miscellaneous duties,” and “Education-research balance aside, there are many miscellaneous duties that prevent me from maintaining a work-life balance.”

Furthermore, the percentage of annual work hours (workload) that faculty members devote to “administration (attending meetings, etc.),” “external activities (academic societies, advisory councils, etc.),” and “clinical and other work” averaged 27.4%, virtually no different from the percentage devoted to research.

In addition, a comparison of the faculty member, undergraduate departmental and graduate departmental survey responses to questions about problems in education reveals that in all three cases, a high proportion of respondents felt they were too busy to secure sufficient time for lab-based student guidance due or class preparation. This suggests that the pressures of other duties make it difficult to maintain the education-research balance.

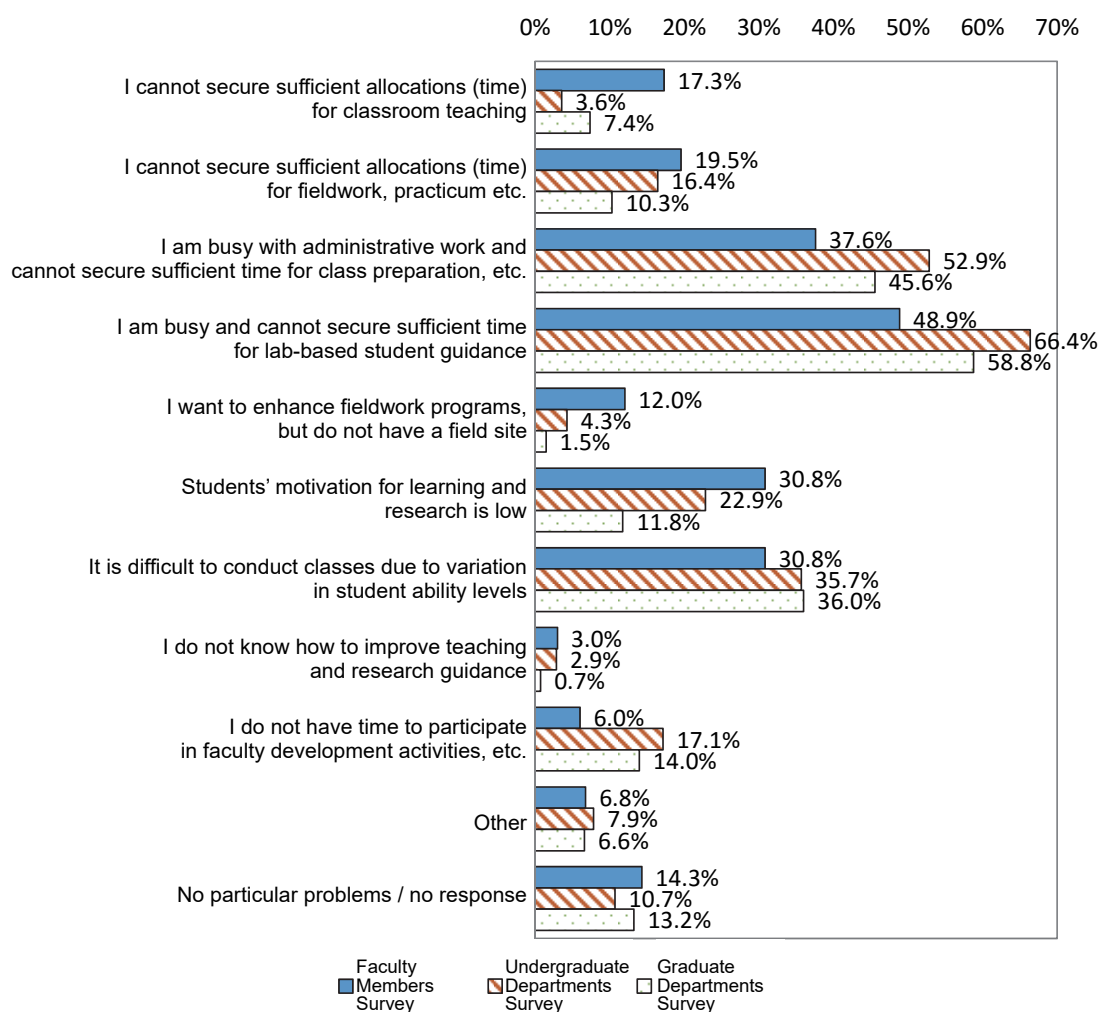


Figure 4-4 Problems in Education (multiple responses permitted)
(Q9 in faculty member survey, Q21 in undergraduate and graduate departmental surveys)

2. Target Qualities and Competencies in Education

In regard to the qualities and competencies that universities aim to cultivate, students feel they have acquired, and employers expect, analysis was conducted from the three perspectives of universities, alumni, and companies.

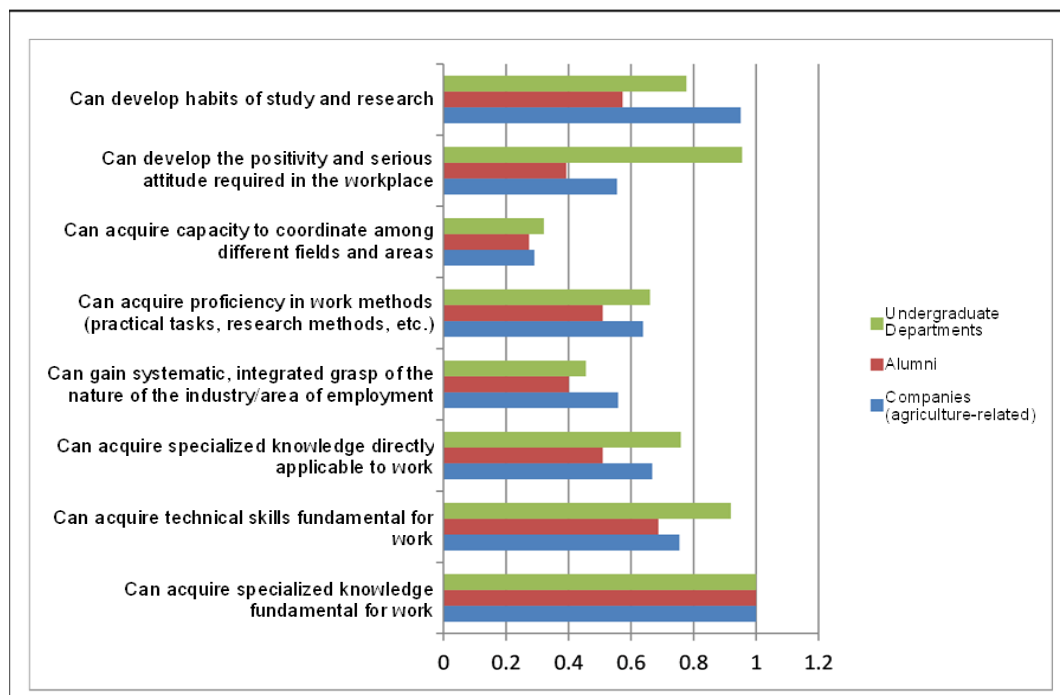
(1) Competencies demanded of agriculture graduates

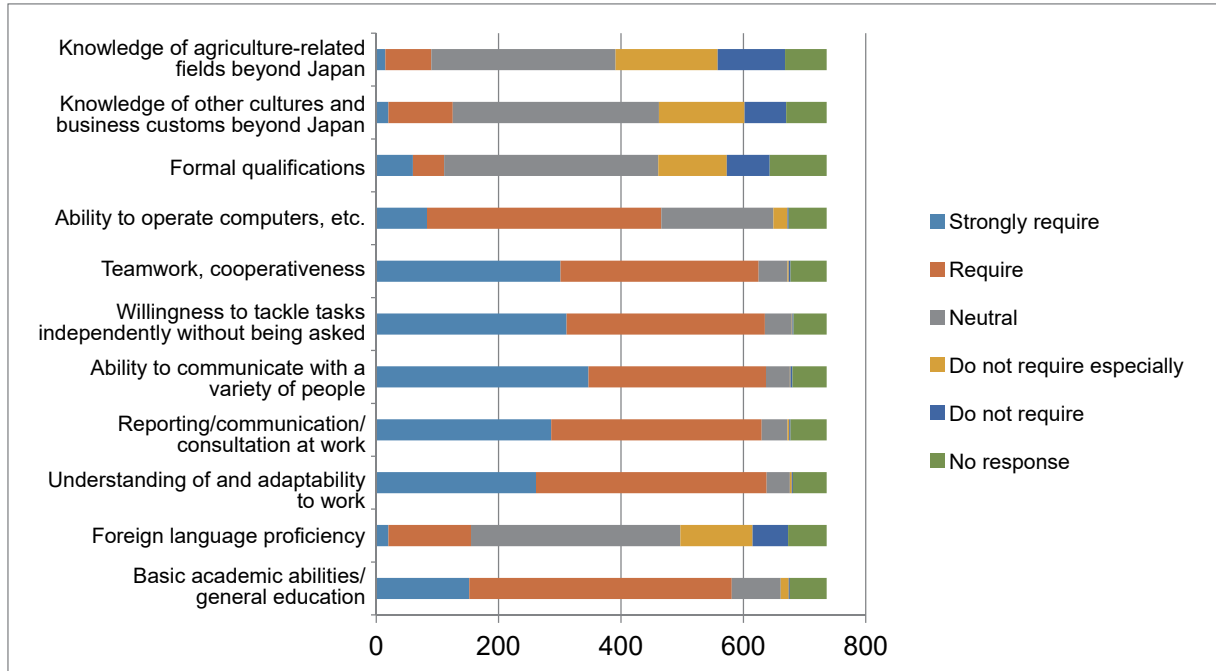
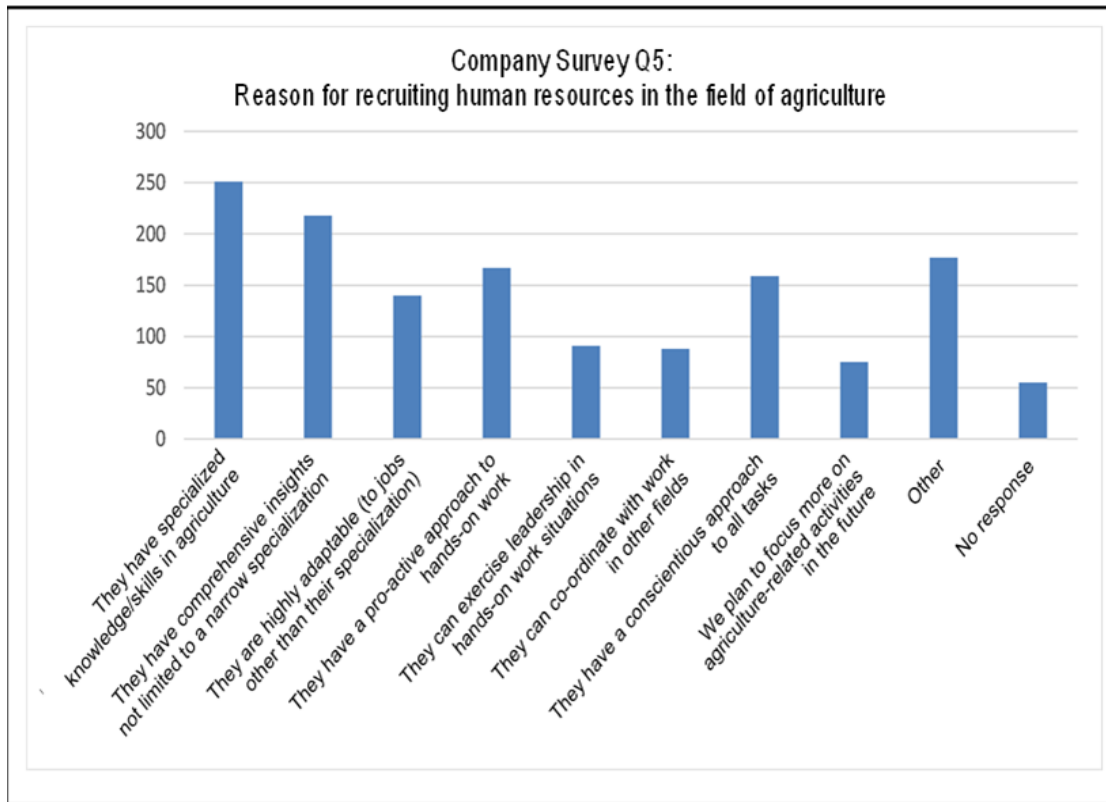
In regard to the competencies demanded of agriculture graduates, responses to questions concerning “target competencies” in the undergraduate and graduate departmental surveys were compared to those concerning “the competency expected most from agriculture graduates” in the company survey. Care is required in comparing results as the departmental surveys permitted multiple responses while

the company survey required a single response only, but it appears that at all educational levels—Bachelor, Master, and Doctoral—university (departmental) emphasis is not as high as company demand in the areas of “ability to mobilize expertise acquired at university while also contributing actively in non-technical areas” and “ability to perform with motivation and fundamental skills regardless of specific specializations.”

Furthermore, companies do not appear to require graduates of Bachelor degrees to possess “ability to perform technical roles mobilizing expertise acquired at university” as much as universities (departments) seek to cultivate such ability. These results suggest a perception gap between universities and companies in terms of cultivating abilities to work outside one’s specialization and utilizing the expertise of Bachelor degree holders.

Qualities/ competencies of a specialist	Can acquire specialized knowledge fundamental for work
	Can acquire technical skills fundamental for work
	Can acquire specialized knowledge directly applicable to work
Qualities/ competencies of an employee	Can acquire proficiency in work methods (practical tasks, research methods, etc.)
	Can develop the positivity and sincerity required in the workplace
Qualities/ competencies of a leader	Can acquire capacity to coordinate among different fields and areas
	Can gain systematic, integrated grasp of the nature of the industry/area of employment
Qualities/ competencies of an informed citizen	Can develop habits of study and research





(2) Evaluation of agriculture graduates

Evaluations of agriculture graduates were compared with those of science and technology graduates in general across the company survey (companies that require specialized knowledge/skills in agriculture) and departmental surveys. No difference was found between companies' evaluation of agriculture graduates and their evaluation of science and technology graduates. Overall, graduates tend to be evaluated less highly by wider society than universities (undergraduate and graduate departments) believe. However, in regard to leadership qualities and competencies such as overall grasp of issues and capacity to co-ordinate across different fields, universities acknowledged similar insufficiencies as those identified by companies and graduates. In general, companies' (employers') evaluations were higher than the self-evaluations of alumni (employees) in these areas. Evaluations were comparatively low in regard to practical workplace skills. This weakness, however, is common across both agriculture and science and technology graduates in general, and appears to be a point of consensus despite small differences of opinion across companies, alumni and universities. This is understandable in light of the fact that science and technology education has traditionally focused on training technical specialists for employment. On the other hand, companies recruiting graduates are looking for people with specialized knowledge, suggesting that their needs match well with universities' perceptions. Companies' responses can also be interpreted as indicating demand for human resources with both highly specialized skills and generalist skills. Personnel management in Japanese companies tends to follow a pattern of engaging younger employees in specialized work, then gradually diverting them into generalist roles. The survey data can be seen to verify this pattern. The ideal that emerges overall is of an employee equipped with solid specialist knowledge, academic skills, and capacity for self-improvement, who engages sincerely and earnestly in their work and is willing to take on practical workplace roles. Furthermore, the data suggest that companies have lower expectations than might have been expected in regard to employees' capacity to exercise leadership and coordinate flexibly across different fields.

3. Educational Systems

The study explored relationships between the qualities and capabilities above and the actual content of educational curricula.

(1) Connecting needs in curricular courses

The study sought to gain an overview of connections between university education and wider society in the educational content of curricular courses. Surveys examined companies' expectations in regard to science and technology personnel in general and personnel in the field of agriculture in general, the areas that university departments consider to be well-developed, those which faculty members emphasize, and those which agriculture graduates say have proved useful to them.

Curriculum	Lecture courses (general)
	Lecture courses (specialized)
	Fieldwork courses
	Laboratory courses
	Practicum courses
	Seminars in research labs, etc.
	Graduation research / thesis writing
	Internships (for credit)
	Internships (not for credit)
	Study abroad
Extracurricular activities	Club and volunteer activities
Private activities	Part-time work

Companies and universities are in agreement on the importance of curricular courses including general education courses, specialized courses, laboratory courses, practicum courses, fieldwork courses, research lab seminars, and thesis courses (thesis supervision). Companies expect a solid grounding in lecture courses especially, and perceive general education courses as more important than universities would expect. In addition, companies tend to evaluate study abroad experience highly, while universities' work in this area is insufficient. Universities are aware of this deficiency, however, and list study abroad as an educational component that they hope to strengthen in the future. Companies and universities are in consensus on these points. Companies were also asked to assess the value of experiences outside the formal curriculum such as part-time work and club activities. They perceive especial value in club activities, rating them as highly as specialized curricular courses. Evaluations of part-time work are almost as high. These results are related to the qualities that working adults are expected to possess such as cooperativeness, communication, and leadership, demonstrating that the educational benefits of university student life are not limited to curricular courses. The data in this regard offer important insights into the anticipated roles and functions of university campuses, where impressionable young people spend an important part of their lives.

It should be noted that the university survey did not include items such as club activities and part-time work. In addition, the results of the faculty member survey, although conducted only in the Tokyo University of Agriculture and Technology's Faculty of Agriculture, yielded results highly consistent with those from the survey of 140 undergraduate departments. The faculty member survey questionnaire sheets were distributed at the start of a faculty council meeting and collected at the end of the meeting, making for a simple and inexpensive survey.

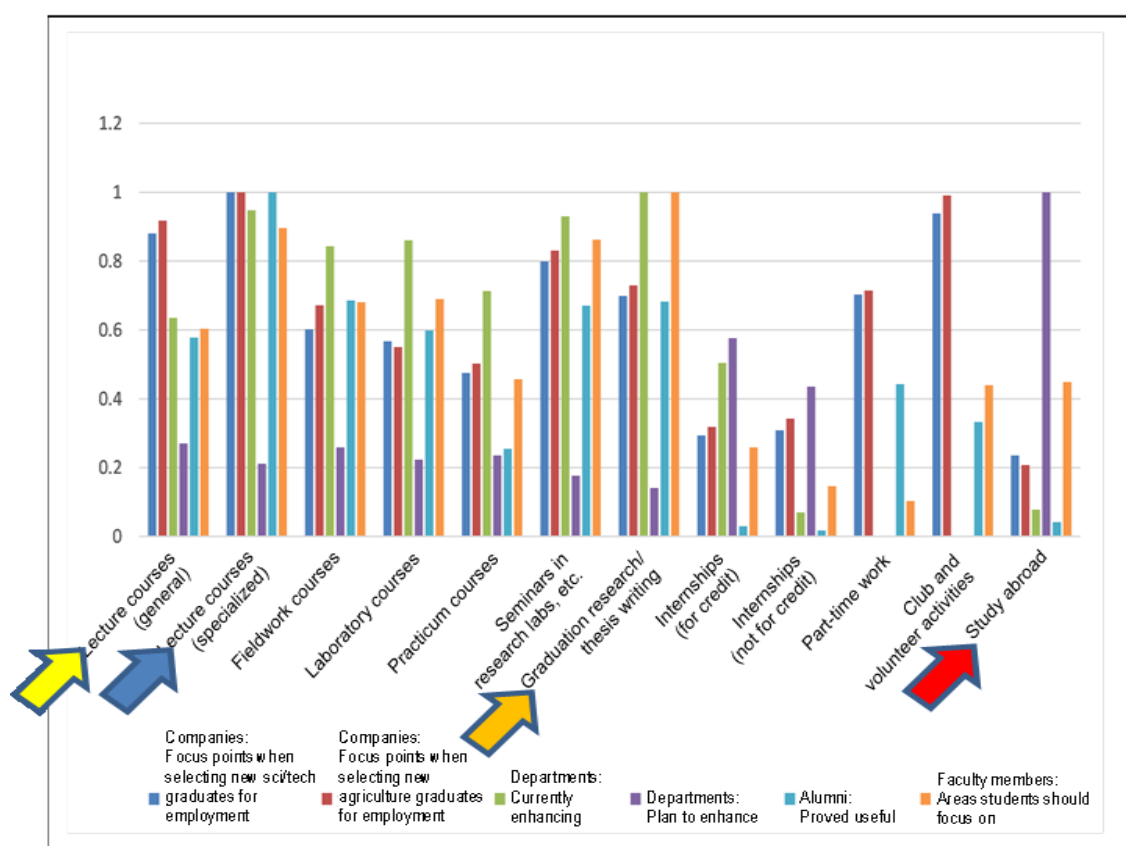


Figure 4-3 Comparison of Study and Experiences at University
(Q6 in faculty member survey, Q16_1 in undergraduate departmental survey,
Q14 in alumni survey, Q8 (2) in company survey)

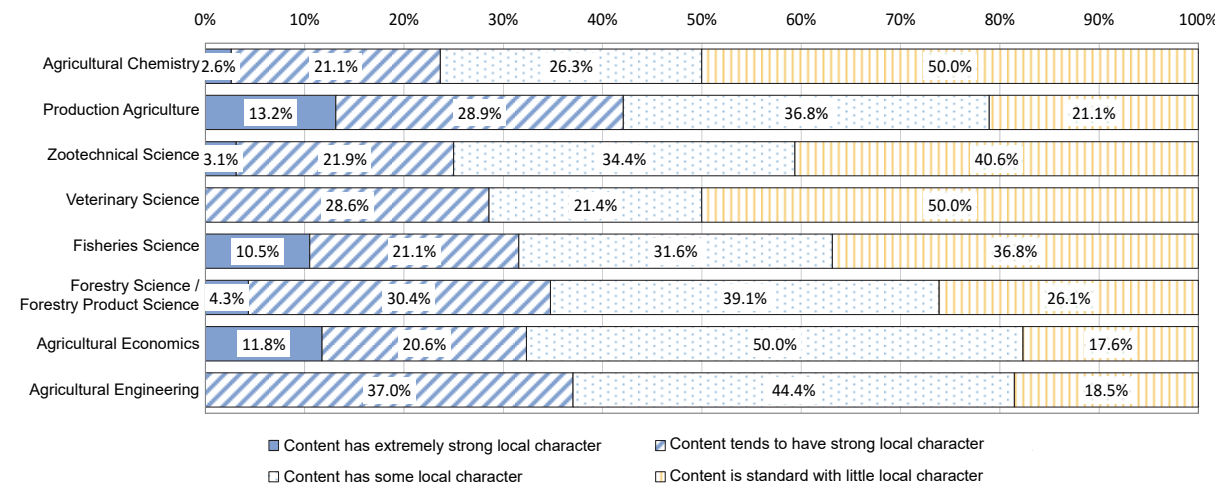
(2) Connecting needs in fieldwork courses

In regard to practicum and fieldwork, characteristic features of agriculture education, the corporate needs (company survey results) were compared with actual activities in universities (departmental survey results) across the seven basic disciplines of agriculture. The proportions of practicum/fieldwork required by companies were found to be consistent with the practicum/fieldwork currently implemented by departments across all disciplines. Even in the discipline of fisheries science, companies recognize the significance of undertaking “farm fieldwork,” “forestry fieldwork,” and “clinical animal training.” This could be seen as acknowledgment of the value of active physical training itself.

4. Local Dissemination of Agricultural Technology

The forms taken by higher education institutions of agriculture and local agricultural extension organizations are closely related to the policies of the state. In the United States, state universities (land grant universities) are responsible for agricultural extension, while in Germany, state agricultural laboratories are attached to universities closely relating to each other in terms of both

organizational structure and personnel, realizing a system where universities are directly involved in local agricultural extension. In the case of Japan, the responsibility of local agricultural extension lies with public laboratories and research institutes operated by national and prefectural governments. Seen in this light, the phenomenon whereby more than 10% of universities have started to function as organized agricultural extension centers is something that has emerged spontaneously out of collaboration between universities and local communities, providing a new forum for pursuit of activities in the fields of both education and research.



The situation in countries such as the U.S. and Germany, where universities are directly involved in agricultural extension activities, is related to the heavy social responsibilities and prestige of university departments for agricultural education and research.

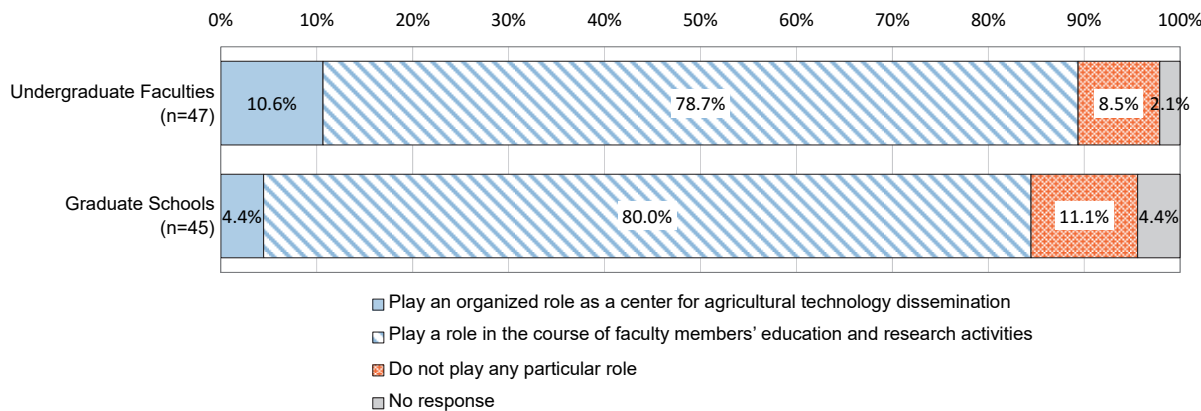


Figure 3 Universities' role in agricultural extension in 47 regions of Japan

Universities play a role in agricultural extension across all seven disciplines, but are especially committed in the field of veterinary science (50%), followed by production agriculture and fisheries science.

5. Partnerships with Wider Society

(1) Educational partnerships

11% of the 1081 companies responding to the survey are implementing or planning to implement partnerships with universities, and close to 30% are interested in doing so. 40% of companies are positive about working with university partners, and their interests in educational partnership are synchronized with those in joint research.

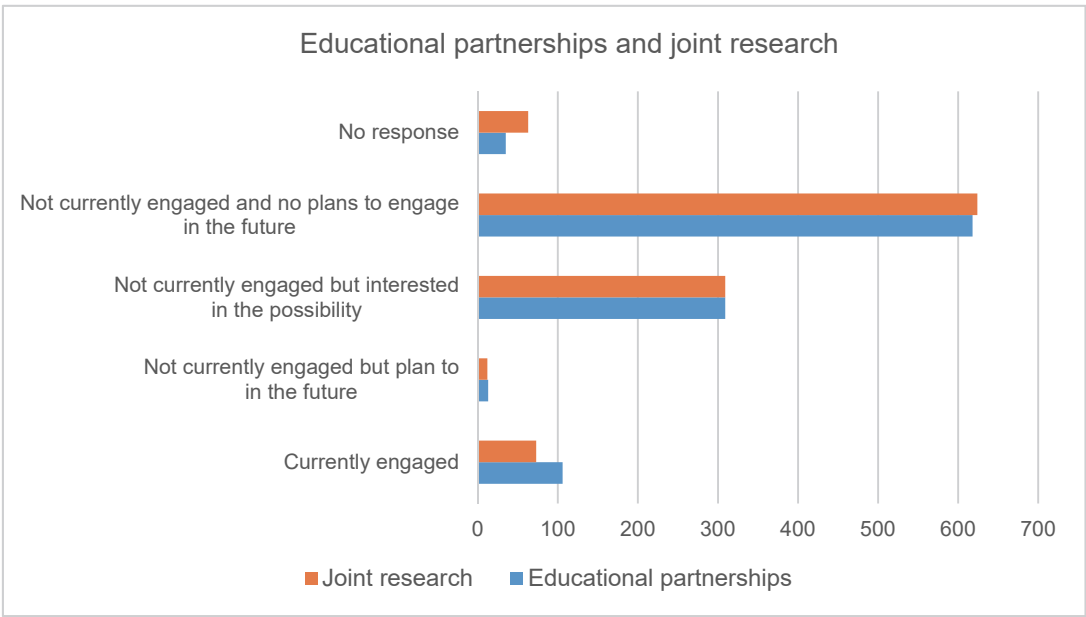
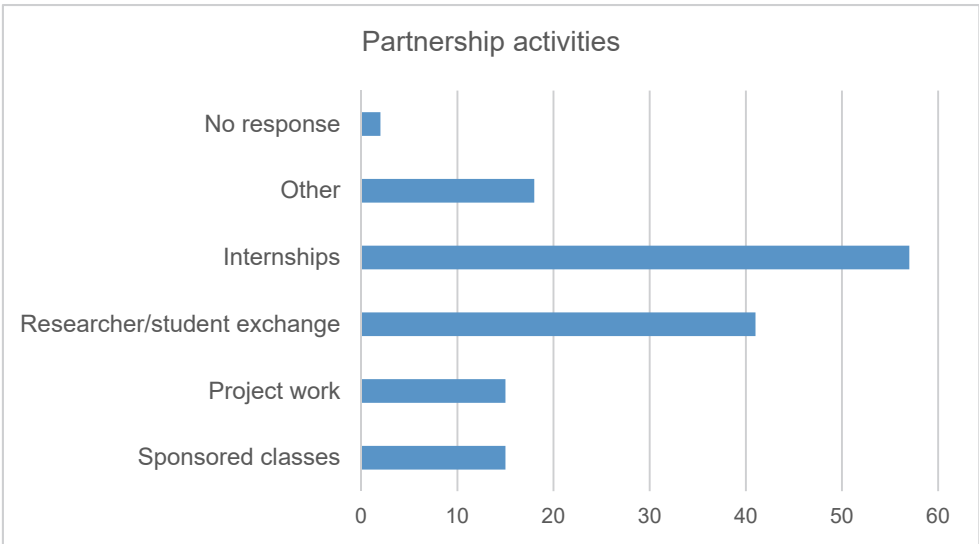
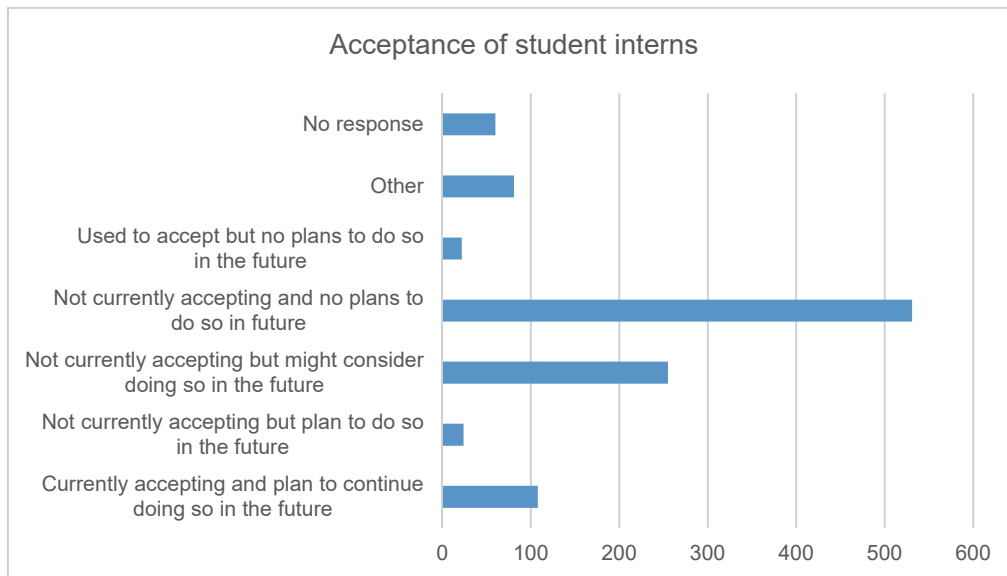


Figure 3-26 Educational partnerships and joint research



The 106 companies that are currently engaged in educational partnerships were asked about the content of these partnerships. More than half were internships, while 15 companies were engaged in

research/student exchange, project work, and sponsored classes.



As shown above, 108 companies currently accept students for internships (including student fieldwork and student exchange), and as many as 250 companies indicated they might consider accepting interns in the future. In light of the strong correlation between educational partnerships and joint research, this suggests that a similar number of companies can be seen as potential joint research partners. It can be concluded that of the 1081 companies responding to the survey, including those which do not employ agriculture graduates, 360 companies or 30% of the total have some interest in educational partnerships and/or joint research with universities.

As one means of converting this potential to reality, the survey asked university departments about their efforts to understand the educational needs of industry. There was a high proportion of positive responses, with 47.1% of undergraduate departments indicating that they furnish opportunities for university-industry dialogue in order to raise graduates' awareness of career paths, and 39.7% of graduate departments responding that they enable students to participate in joint research with companies. Close to half of all university respondents currently furnish opportunities for interaction and dialogue with industry.

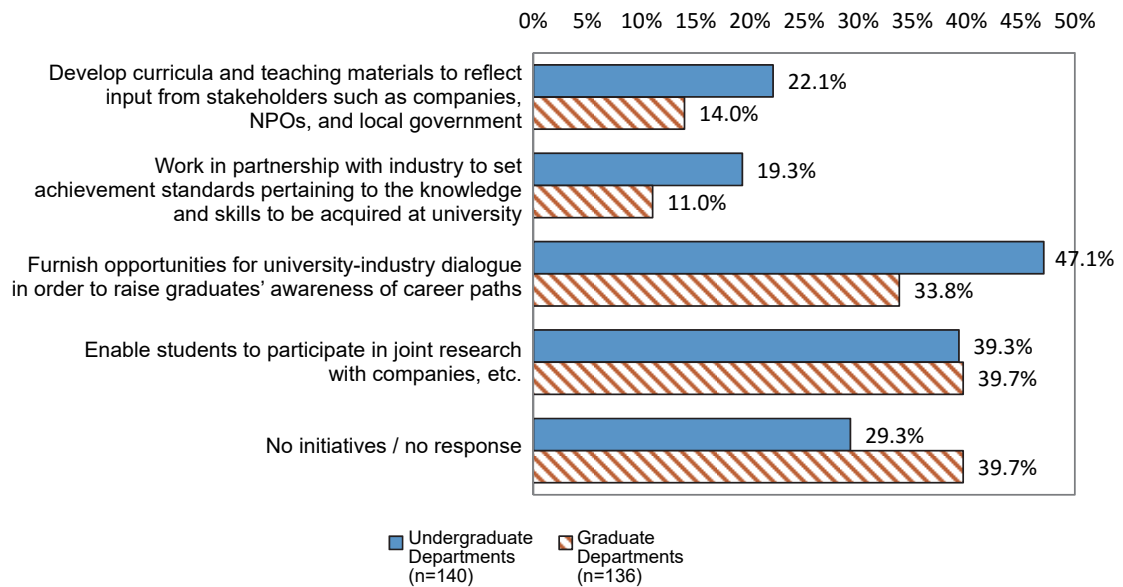


Figure Initiatives to understand the educational needs of industry
(multiple responses permitted)

However, the areas of job placement, education, and research are each entrusted to a different organizational unit within the university, such as the careers division, academic affairs (student affairs) division, and research administration division. There is market potential to realize concrete partnerships with industry if horizontal links can be built effectively within the university. On the other hand, if systems for collaboration across a university's different organizational units do not function properly, it is highly likely that the university will be unable to capitalize on approaches from prospective partners in industry and the local community.

(2) Partnerships with the local community

Open-ended responses and interviews (Kinouchi, Kato)

(3) New partners

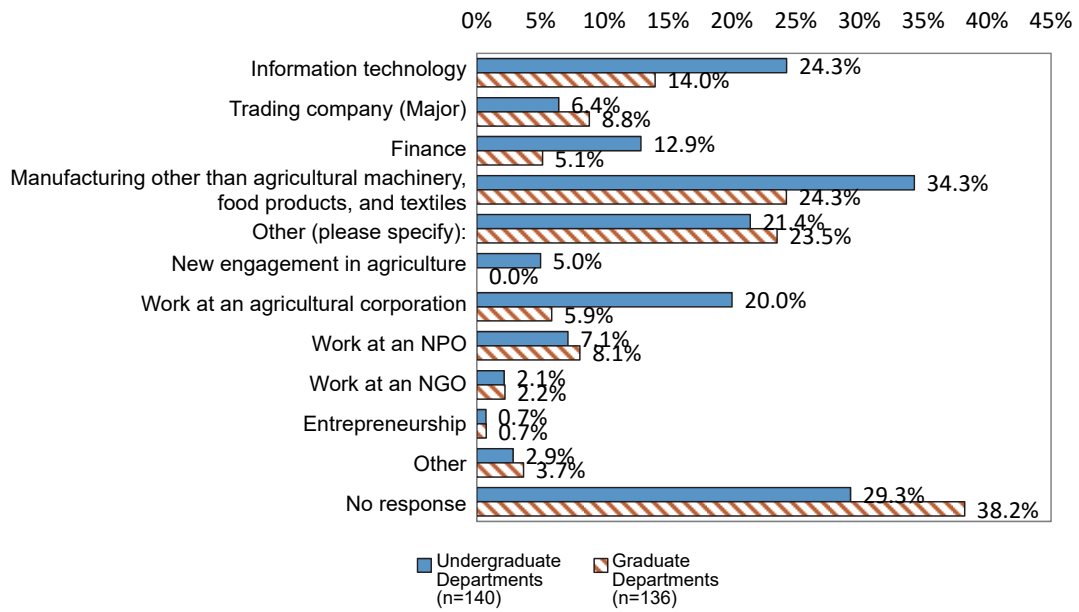
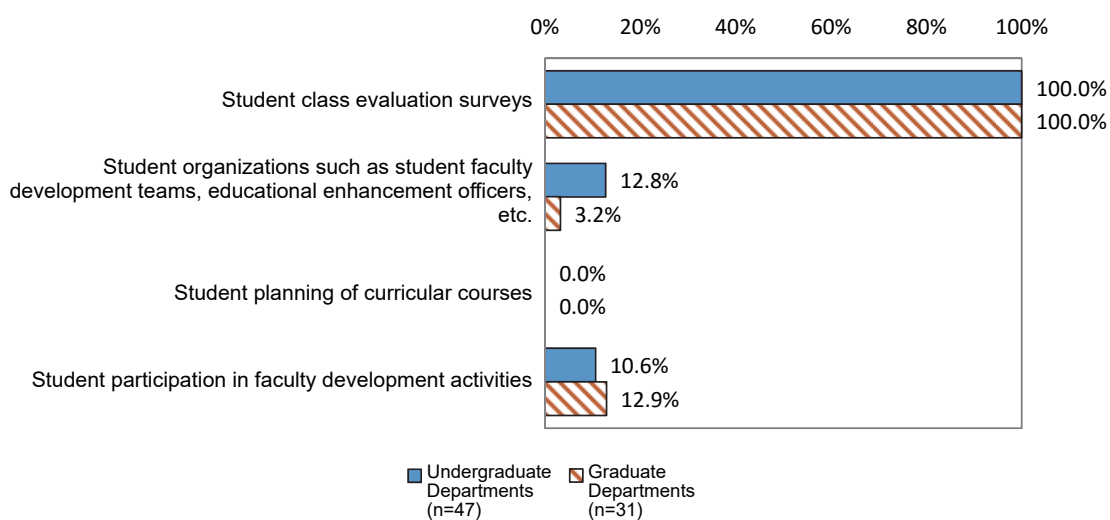


Figure 3-36

IV. Methods for Evaluating Educational Contents and Systems

1. Comprehending current conditions

In response to a survey question concerning evaluation of classes by students, 100% of both undergraduate faculties and graduate schools reported that they were currently implementing class evaluation questionnaires. 10% or more of universities also involve students in activities such as educational enhancement and faculty development.



Evaluation of classes by students (multiple responses permitted)

2. Trial class evaluation systems

V. Conclusions: Advancing Professional Education in the Field of Agriculture

The basic survey and sample survey provided the basis for subsequent oral surveys, interviews with opinion leaders, and domestic and international workshops. These activities identified the following important issues to inform the pursuit of educational improvements in the field of agriculture.

1. Issues

1. Importance of evaluation: Importance of evaluating faculty members, classes, and degree programs; importance of careful selection of evaluation methods.
2. Importance of each university being an entity that exercises autonomous judgment and action, in order to enjoy the respect of wider society as an institution of education, as well as having the capacity and intent to develop an evidence-led understanding of its own characteristics and roles as an educational institution.
3. Partnerships between universities, between undergraduate departments, and between graduate departments that build on characteristic strengths.
4. Collaboration across different organizational units within universities, in order to respond pro-actively to the high demand and expectations for local community partnerships revealed by the data.
5. Understanding newly-enrolling students' motivations in their choice of university, by reference to each university's ideals and standpoints. Questioning whether students are really making their choices based solely on university research quality and job placement.
6. Understanding developments chronologically; the need for perspectives that encompass agricultural education from the latter Edo and Meiji periods through to the present, and into the future.
7. Benefits of exploring in greater depth the educational outcomes and latent potential (including potential in relation to innovation and globalization, which may seem the most distant concerns) of characteristic educational offerings in the field of agriculture, such as farm fieldwork, forestry fieldwork and other forms of field-based and occupational farming training.
8. New roles and needs of affiliated facilities.
9. Knowledge of ethics, risk management, and university governance structures (learning about responsibilities of higher education practitioners and higher education institutions).

10. Possibility of enhancing the value of this study in the field of agriculture through comparison with similar studies in the field of engineering, in light of the fact that engineering provided the original model for education in science and technology disciplines in the modern university.
11. Need for international forums (panels) on agriculture education. Such forums exist in fields such as engineering and medicine, and initial moves in this direction are underway in Asia in the field of veterinary science, but not in agriculture. Clearly, one major reason is the inherently strong local nature of agriculture and the systematic difference between the history of science education and the history of agricultural technology education. As the world becomes more deeply interconnected, however, there are new opportunities to acknowledge the universal character of agriculture education's characteristically local focus. It is therefore hoped that forums and consortia will be established in order to discuss education in the field of agriculture, exchange information and opinions on curricular structures, and pursue constructive activities.

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture

— Survey of Education/Research Balance —

I. Your Situation

Q1. Please indicate the approximate percentage of your annual work hours (workload) that is devoted to each of the following task areas. (Enter your responses as numerals)

Area		Percentage
Education	Teaching classes (including preparation)	%
	Research guidance (thesis supervision, etc.)	%
Research		%
Administration (attending meetings, etc.)		%
External activities (academic societies, advisory councils, etc.)		%
Clinical and other work		%
Total		100%

Q2. In regard to your own education and research activities, please select the most appropriate response for each of the statements below.

(Circle a number from 1 to 5 corresponding to the most appropriate response)

			Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
a.	Relationship between education and research	I am able to reflect my research findings in my educational activities	1	2	3	4	5
b.		Information acquired in the course of education (teaching / student guidance) is reflected in my research	1	2	3	4	5
c.	Time allocation: reality and ideals	I tend to spend more time on research than education	1	2	3	4	5
d.		I would like to spend more time on research than education	1	2	3	4	5
e.	Education/research balance	I would like to place more emphasis on research, but my time is taken up with education (including student guidance)	1	2	3	4	5
f.		I would like to place more emphasis on education (including student guidance), but my time is taken up with research	1	2	3	4	5
g.		I would like to place more emphasis on education and/or research, but my time is taken up with university administration (meetings, internal/external duties), university events, etc.	1	2	3	4	5

Q3. Please indicate what percentage of your annual teaching hours are devoted to specialized (major) and general education (common) courses respectively. (Enter your responses as numerals; total should add up to 100).

Specialized (major) courses	General education (common) courses

Q4. Please comment freely on your education/research balance, including any problems you are facing (ex: time allocation difficulties, pressure of other duties, etc.), and the merits of balancing education and research (ex: synergies between education and research activities, etc.).

■Problems in education/research balance, etc.

■Merits of balancing education and research activities, etc.

II. Undergraduate and Graduate Students' Study Activities

Q5. In regard to the students to whom you are providing research guidance (your seminar students), please indicate the number of hours per week that they devote to research on average, and the number of hours that you would consider ideal. (Enter your responses as numerals)

	Undergraduate (Bachelor's) students	Graduate (Master's) students
Average hours per week devoted to research	hours	hours
Ideal hours per week devoted to research	hours	hours

Q6. What kinds of study activities and experiences do you think students majoring in agriculture-related fields should focus on while they are at university? Please mark your preferred focus areas with a ○, and those requiring particular emphasis with a ⊙.

a.	Curricular courses	Lecture courses (general)	
b.		Lecture courses (specialized)	
c.		Fieldwork courses	
d.		Laboratory courses	
e.		Practicum courses	
f.		Seminars in research labs, etc.	
g.		Graduation research / thesis writing	
h.		Internships (for credit)	
i.	Extra-curricular activities	Internships (not for credit)	
j.		Part-time work	
k.		Club and volunteer activities	
l.	Study abroad		

III. Paradigms for Agriculture Education

Q7. In regard to your educational activities, please select the most appropriate response for each of the statements below.

(Circle a number from 1 to 5 corresponding to the most appropriate response)

	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
a. In my classes I provide many opportunities for practical training such as farming experience	1	2	3	4	5
b. I provide my seminar students with many opportunities to encounter field situations	1	2	3	4	5
c. In my classes and seminars I provide instruction in light of the distinctive characteristics of the region in which our university is located	1	2	3	4	5
d. In my classes I utilize methods such as active learning	1	2	3	4	5

Q8. In regard to your laboratory and fieldwork courses in agriculture, please select the most appropriate response for each of the statements below.

(Circle a number from 1 to 5 corresponding to the most appropriate response)

	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
a. I can secure sufficient time for laboratory and fieldwork in my educational activities.	1	2	3	4	5
b. Laboratory and fieldwork courses take up my time, putting a strain on lecture courses and research activities.	1	2	3	4	5
c. Greater consideration to safety issues is now given in laboratory and fieldwork activities, and there are more safety-related tasks to undertake in practice.	1	2	3	4	5

Q9. Please indicate the problems you face in the area of education for students. (Multiple responses permitted; please circle any that apply)

1. I cannot secure sufficient allocations (time) for classroom teaching
2. I cannot secure sufficient allocations (time) for fieldwork, practicum etc.
3. I am busy with administrative work and cannot secure sufficient time for class preparation, etc.
4. I am busy with administrative work and cannot secure sufficient time for lab-based student guidance
5. I want to enhance fieldwork programs, but do not have a field site
6. Students' motivation for learning and research is low
7. It is difficult to conduct classes due to variation in student ability levels
8. I do not know how to improve teaching and research guidance
9. I do not have time to participate in faculty development activities, etc.
10. Other (please specify):
11. No particular problems

Q10. Please comment freely on the education of students majoring in agriculture at university/graduate school: problems you are facing (example: insufficient time for laboratory and fieldwork activities, etc.) and future prospects (example: focus on global education, education for innovation, etc.).

■Problems in education of students majoring in agriculture at university/graduate school

■Future prospects for education of students majoring in agriculture at university/graduate school

Contact Details

Finally, please enter details of the person who completed this form.

Position	<div> <div>1. Professor</div> <div>2. Associate Professor</div> <div>3. Lecturer</div> </div> <div> <div>4. Assistant Professor</div> <div>5. Other (please specify):</div> </div>
Number of students under your research guidance (supervision)	
Field of research	<div> <div>1. Agricultural Chemistry</div> <div>2. Production Agriculture</div> <div>3. Zotechnical Science</div> <div>4. Veterinary Science</div> <div>5. Fisheries Science</div> </div> <div> <div>6. Forestry Science / Forestry Product Science</div> <div>7. Agricultural Economics</div> <div>8. Agricultural Engineering</div> <div>9. Other (please specify):</div> </div>

End of survey. Thank you for your cooperation.

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture — Industry Needs Survey —

December 2015

Request for Cooperation

This questionnaire is to be completed by the person in charge of personnel affairs (or the managerial staff member or executive empowered to make personnel decisions) or the business proprietor (representative). In the event that questions 10-13 cannot be answered by the person in charge of personnel affairs, we would be grateful if answers could be provided by a person engaged in activities in the field of agriculture (a person who majored in agriculture at university or graduate school).

As part of an Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Tokyo University of Agriculture and Technology is conducting a questionnaire survey in order to collect information on the activities of science and technology graduates in the field of agriculture and solicit views on the needs of industry (including NPOs, municipalities, etc., as well as private-sector companies and organizations) in relation to university education. Individual responses will not be made public under any circumstances without consulting the respondent. The findings of this study are to be used as reference by MEXT when planning university education initiatives in the future. We ask for your kind cooperation based on understanding of the purpose of the study. We understand that you may find it difficult to respond to some questions in certain circumstances. Please feel free to leave the answer section blank in such cases.

Please note that sending and collecting of the questionnaire forms and tabulation of questionnaire responses are handled by a private survey research firm (think tank), Libertas Consulting Co., Ltd.

When you have completed the questionnaire, please place it in the enclosed return envelope (no postage stamp required) and post it by **Friday, December 25**.

If you require further clarification or have any questions about this survey, please contact the inquiries point shown below.

Survey conducted by:

Tokyo University of Agriculture and Technology

Inquiries:

Survey Secretariat (Libertas Consulting Co., Ltd.)
2nd floor, Toetsu Rokubancho Building
2-14 Rokubancho, Chiyoda-ku, Tokyo 102-0085
Staff in charge: Hatta, Kikuchi, Sobajima
E-mail: nougaku@libertas.co.jp
Telephone: 0120-575-332
Office hours: 10:00 – 17:00 (closed Sat/Sun and public holidays)



I. Activities of New Graduate Employees in Your Organization

Q1. Did any regular employees of your organization major in agriculture* at university or graduate school?
(Circle one response)

1. Yes ⇒ Proceed to Q2 **2. No** ⇒ Proceed to Supp. Q.1-2

*"Agriculture" here includes not only areas conventionally offered in agriculture colleges, but also bio-resources, bio-environmental science, applied biology, fisheries, livestock, veterinary science, textiles, etc.

Supp. Q1-2. Does your organization plan to employ university or graduate school agriculture majors in the future?
(Circle one response)

1. Plan to recruit actively ⇒ Proceed to Q5
2. Prepared to recruit (from any major) ⇒ Proceed to Q5
3. No plans to recruit ⇒ Proceed to Q8 on page 4

(Questions 2 to 4 are for those who answered "Yes" to Q1.)

Q2. Please enter the number of university or graduate school agriculture majors among the graduates newly employed by your organization in the 2015 fiscal year. (Enter your responses as numerals; you may use approximate figures)

Overall number of graduates newly employed in fiscal 2015	University (Bachelor's program) agriculture majors	Graduate school (Master's program) agriculture majors	Graduate school (Doctoral program) agriculture majors

Q3. Please indicate the roles/affiliated departments of regular employees (including researchers employed on a fixed-term basis) who majored in agriculture at university or graduate school. Choose from the list of roles/departments below and enter responses for graduates of Bachelor's, Master's and Doctoral Programs separately.

In line (1), please enter the roles/departments to which agriculture majors are mainly assigned.

In line (2), please enter roles/departments to which agriculture majors are assigned, other than those you listed in line (1). (Multiple responses permitted in each field)

■List of Roles/Departments

1. Research	7. Procurement	13. MR
2. Development	8. Planning	14. Sales
3. Production engineering	9. Sales engineering	15. Clerical
4. Manufacturing	10. Marketing	16. Farming
5. Production management	11. Consulting	17. Teaching
6. Quality control	12. System engineering	18. Other (please specify)

*Enter numbers corresponding to the applicable roles/departments (multiple responses permitted)

	Highest degree obtained		
	Bachelor's in agriculture	Master's in agriculture	Doctorate in agriculture
(1) Roles/departments to which agriculture majors are mainly assigned			

(2) Roles/departments to which agriculture majors are assigned, other than those listed in line (1)			
---	--	--	--

Q4. What are your impressions of the average university or graduate school agriculture major employed by your organization? Please provide your evaluation of the matters shown below in comparison to the other science and technology majors you employ. (Circle the appropriate response from 1 to 5 for each item)

	Superior	Generally superior	No difference	Some weaknesses	Inadequate
a. Acquired specialized knowledge fundamental for work	1	2	3	4	5
b. Acquired technical skills fundamental for work	1	2	3	4	5
c. Acquired specialized knowledge directly applicable to work	1	2	3	4	5
d. Gained a systematic, integrated grasp of the nature of the industry/area of employment	1	2	3	4	5
e. Acquired proficiency in work methods (practical tasks, research methods, etc.)	1	2	3	4	5
f. Acquired capacity to coordinate among different fields and areas	1	2	3	4	5
g. Developed the positivity and serious attitude required in the workplace	1	2	3	4	5
h. Developed habits of study and research	1	2	3	4	5

(Questions 5 to 7 are for those who answered “Yes” to Q1 and “Hope to recruit actively” or “Prepared to recruit (from any major)” to Supp. Q1-2.)

Q5. Please indicate the reason(s) why your organization would recruit (plans to recruit actively or is prepared to recruit) university or graduate school agriculture majors in the future. (Circle as appropriate; multiple responses permitted)

1. They have specialized knowledge/skills in agriculture (please specify): 2. They have comprehensive insights not limited to a narrow specialization 3. They are highly adaptable (to jobs other than their specialization) 4. They have a pro-active approach to hands-on work 5. They can exercise leadership in hands-on work situations 6. They can co-ordinate with work in other fields 7. They have a conscientious approach to all tasks 8. We plan to focus more on agriculture-related activities in the future 9. Other (please specify):

Q6. Please indicate which of the following best describes the competency that your organization expects most from agriculture majors of Bachelor's, Master's, and Doctoral programs. (Choose one response for each program type)

1. Ability to conduct innovative research and development with outstanding expertise acquired at university 2. Ability to perform technical roles mobilizing expertise acquired at university 3. Ability to perform technical roles across a broad range of fields, making use of approaches and learning techniques acquired at university, even if not necessarily making direct use of the expertise acquired at university 4. Ability to mobilize expertise acquired at university while also contributing actively in non-technical areas 5. Ability to perform with motivation and fundamental skills regardless of specific specializations 6. Ability to work pro-actively in hands-on situations
--

7. Other (please specify):

Bachelor's

Master's

Doctoral

Q7. To what extent does your organization expect university or graduate school agriculture majors to have the following competencies? Please choose the most appropriate response for each item. (Circle the applicable number from 1 to 5 for each one)

	Strongly require	Require	Neutral	Do not require especially	Do not require
a. Specialized knowledge / academic ability in specialized subjects	1	2	3	4	5
b. Basic academic abilities / general education	1	2	3	4	5
c. Foreign language (e.g. English) proficiency ⇒ Expected TOEIC score: _____	1	2	3	4	5
d. Understanding of and adaptability to work	1	2	3	4	5
e. Reporting/communication/consultation at work	1	2	3	4	5
f. Ability to communicate with a variety of people	1	2	3	4	5
g. Willingness to tackle tasks independently without being asked	1	2	3	4	5
h. Teamwork, cooperativeness	1	2	3	4	5
i. Ability to operate computers, etc.	1	2	3	4	5
j. Formal qualifications Name of qualification(s):	1	2	3	4	5
k. Knowledge of other cultures and business customs beyond Japan	1	2	3	4	5
l. Knowledge of agriculture-related fields beyond Japan	1	2	3	4	5

II. Competencies and Experiences Expected of Human Resources in Science and Technology Fields (including Agriculture)

(All respondents should answer these questions)

Q8. (1) Please indicate the items you focus on when selecting new science and technology (including agriculture) graduates for employment. (If you do not employ science and technology graduates, please proceed to Q12 on page 7)

(2) Please indicate the items you focus on when selecting new agriculture graduates for employment. (If you do not employ agriculture graduates, please proceed to Q9)

(Mark all applicable items with a ○)

			(1) Science/tech. graduates generally	(2) Agriculture graduates
a.	Curricular courses	Lecture courses (general)		
b.		Lecture courses (specialized)		
c.		Fieldwork courses		
d.		Laboratory courses		
e.		Practicum courses		
f.		Seminars in research labs, etc.		
g.		Graduation research / thesis writing		
h.		Internships (for credit)		

i.	Extra-curricular activities	Internships (not for credit)		
j.		Part-time work		
k.		Club and volunteer activities		
l.	Study abroad			
m.	Do not focus on study or experiences at university			

(Please answer this question in regard to the regular employees of your organization in science and technology fields (including agriculture))

Q9. (1) In what ways do you think study and other experiences at university is useful to regular employees of your organization who majored in science and technology fields (including agriculture) at university or graduate school?

(2) In what ways do you think study and other experiences at university is useful to regular employees of your organization who majored in agriculture at university or graduate school? (If you do not employ agriculture graduates, please proceed to Q12 on page 7)

(Mark all applicable items with a ○)

	(1) Science/tech. graduates generally	(2) Agriculture graduates
a. They can acquire specialized knowledge fundamental for work		
b. They can acquire technical skills fundamental for work		
c. They can acquire specialized knowledge directly applicable to work		
d. It helps them gain a systematic, integrated grasp of the industry/field		
e. It helps them learn work methods (practical tasks, research methods, etc.)		
f. They can acquire a capacity to coordinate among different fields and areas		
g. They can develop the positivity and sincerity required in the workplace		
h. They can develop habits of study and research		
i. Other (please specify):		
j. University study is not at all useful		

III. Competencies and Experiences Expected of Human Resources in the Field of Agriculture

(Questions 10 and 11 are for those who have regular employees who majored in agriculture at university or graduate school [those who answered "1. Yes" to Q1]. If you do not have such employees, please proceed to Q12 on page 7.)

* In the event if it is difficult for the person in charge of personnel affairs to answer questions 10-13, we would be grateful if answers could be provided by a person engaged in activities in the field of agriculture (a person who majored in agriculture at university or graduate school).

Q10. There are seven basic agricultural disciplines, as shown below.*

	Discipline	Outline
1	Agricultural Chemistry	Studies directed to explication of the bio-mechanisms of animals, plants and microorganisms from individual to molecular levels, and discovery and development of applications for a diversity of chemical substances that govern biological activity.

2	Production Agriculture	The disciplinary foundations of agriculture, addressing the production and use of crops, horticultural plants, etc. (including sericulture) related to food and energy resources and human lifestyles.
3-1	Zootechnical Science	Basic biosciences and applied zoological sciences related to industrial animals (livestock, poultry, insects), companion animals, wildlife, laboratory animals, etc.
3-2	Veterinary Science	The study of diseases and injuries in animals other than humans, and their medical treatment, physiology, hygiene, etc.
4	Fisheries Science	Studies directed to the explication of the mechanisms and dynamics of biofunctions and bioproduction in the wide variety of organisms that inhabit oceans, lakes and rivers, together with their sustainable development, use and management for food production and other renewable resource purposes and the conservation of aquatic environments as a foundation therefor.
5	Forestry Science / Forestry Product Science	Studies of forests and forest resources such as timber and fungi, directed to the explication of diversity and maintenance mechanisms of forest ecologies; the conservation and use of the multiple functions of forests including land preservation, carbon dioxide absorption, and human health and leisure; the revitalization of forestry and forestry products as industries using forests and forestry products sustainably; and research and development in timber science and technology.
6	Agricultural Economics	Studies of problems concerning agriculture, food, rural communities, resources, and environments globally and within Japan, directed to analysis using methods from economics and other humanities and social sciences, identification of actual social conditions, and formulation of methods and means to address the problems.
7	Agricultural Engineering	The use of engineering approaches and methods to address problems in agriculture. Involves studying the reciprocal systems of biological, environmental and human activity in order to achieve advancements in production infrastructure while building sustainable societies in harmony with nature.

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)

<http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

- Q10-1. (1) In your organization's field of activity (if you operate in multiple fields: choose the one in which most agriculture majors are engaged), what knowledge and skills in each of the above seven basic agricultural disciplines are required? Use a ◎ mark to indicate specialized knowledge/abilities which are especially important, and a ○ to indicate specializations which are desirable.
- (2) Use a ○ to indicate disciplines in which you would like your employees to have had field experience or the like.
- (3) Specifically what kinds of knowledge are required in each discipline? Circle the important skill or knowledge keywords.

Discipline		(1) Required knowledge/abilities ◎Especially important ○Desirable	(2) Fieldwork needs (mark with a ○ if applicable)	(3) Important skill keywords (circle the applicable skills if any of the following seem to apply to your organization's activities)
1	Agricultural Chemistry			<ul style="list-style-type: none"> • Natural Organic Chemistry • Molecular Biology • Enzymology • Microbiology • Zymology • Botany • Zoology • Food Science • Information Science • Other:

Discipline		(1) Required knowledge/abilities ◎Especially important ○Desirable	(2) Fieldwork needs (mark with a ○ if applicable)	(3) Important skill keywords (circle the applicable skills if any of the following seem to apply to your organization's activities)
2	Production Agriculture			<ul style="list-style-type: none"> • Crop Science • Horticulture • Agronomics • Breeding • Soil Science and Plant Nutrition • Plant Pathology • Weed Science • Applied Zoology and Entomology • Agroecology • Cropland Ecosystem • Landscape Architecture • Landscape and Ecology Planning • Sericultural and Entomological Science • Other:
3-1	Zootechnical Science			<ul style="list-style-type: none"> • Overview of Zootechnical Science • Animal Husbandry • Animal Breeding • Animal Breeding Management • Animal Nutrition • Animal Physiology • Animal Anatomy • Animal Microbiology • Animal Immunology • Animal Hygienics • Theriogenology • Wildlife Zoology • Other:
3-2	Veterinary Science			<ul style="list-style-type: none"> • Veterinary Ethics and Laws • Anatomy • Histology • Physiology • Veterinary Breeding and Genetics • Laboratory Animals • Pharmacology • Animal Pathology • Hygiene • Epidemiology • Toxicology • Other:
4	Fisheries Science			<ul style="list-style-type: none"> • Marine Environment • Physiology and Ecology of Organisms • Fisheries and Aquaculture • Use and Processing • Economics and Management of Fisheries • Logistics • Fishing Communities • Fisheries Policy • Other:
5	Forestry Science/Forestry Product Science			<ul style="list-style-type: none"> • Silviculture • Forestry Policy • Erosion Control Engineering • Forest Ecology • Forest Engineering • Forest Product Manufacturing • Forest Product Science • Other:
6	Agricultural Economics			<ul style="list-style-type: none"> • Agricultural Economics • Agriculture Policy • Agricultural Management • Agricultural History • Cooperative Associations • Rural Sociology • Other:
7	Agricultural Engineering			<ul style="list-style-type: none"> • Agricultural and Rural Engineering • Rural Planning • Agricultural Mechanics • Post-Harvest Engineering • Agricultural Meteorology • Bioenvironmental Engineering • Agricultural Structures • Agricultural Informatics • Ecological Engineering • Other:
8	Other (please			*Please list important skill keywords.

Discipline		(1) Required knowledge/abilities ◎Especially important ○Desirable	(2) Fieldwork needs (mark with a ○ if applicable)	(3) Important skill keywords (circle the applicable skills if any of the following seem to apply to your organization's activities)
	specify):			

Q10-2. Out of the fields of activity you addressed in Q10-1, please briefly state those (if any) where agriculture majors are especially required or essential.

Q11. Please indicate the types of practical training which would be beneficial for employees to have experienced at university/graduate school in order to engage in the work of your organization as stated in Q9. (Multiple responses permitted; please circle those applicable)

<u>Laboratory</u>	<u>Fieldwork</u>	<u>Information science</u>
1. Bioscience experiments	6. Farm fieldwork	11. Bioscientific simulations, etc.
2. Chemistry experiments	7. Forestry fieldwork	12. Simulations of farms, forests, water environments, global environment, etc.
3. Physics experiments	8. Marine fieldwork	
4. Clinical animal (veterinary) training	9. Fieldwork in farming, forestry or fisheries village, company, or local community	13. Other (please specify):
5. Other (please specify):	10. Other (please specify):	

IV. Partnerships with Universities in the Field of Agriculture

(All respondents should answer these questions)

Q12. Is your organization engaged in any educational partnerships with universities / university research labs in the field of agriculture? (Circle one response)

1. Yes

⇒ Circle all the partnership activities that apply: **A. Sponsored classes** **B. Project work**
C. Researcher/student exchange **D. Internships** **E. Other (please specify):**
Actual content of the activities selected above:

2. No, but we plan to in the future

3. No, but we are interested in the possibility

4. No, and we have no plans to in the future

Q13. Is your organization engaged in any joint research projects with universities / university research labs in the field of agriculture? (Circle one response)

1. Yes (If possible, please state the research topic)

Topic:

2. No, but we plan to in the future

3. No, but we are interested in the possibility

4. No, and we have no plans to in the future

Q14. Is your organization interested in accepting students majoring in agriculture at university or graduate school as interns? (Circle one response)

1. Yes, we already accept them and plan to continue doing so in the future
2. We don't currently accept them, but we plan to do so in the future
3. We don't currently accept them, but we might consider doing so in the future (we are interested)
4. We don't currently accept them, and we have no plans to do so in the future
5. We used to accept them, but we have no plans to do so in the future
6. Other (please specify):

Q15. Please write freely about your opinions and requests concerning education (for example: local agriculture, global human resource development, career education, etc.), joint research, and community engagement activities in the field of agriculture at universities.

Contact Details Finally, please enter details of your organization and the person who completed this form.

Organization		
Address	〒	
Organization type	1. Joint stock company 2. Limited liability company 3. Incorporated NPO 4. Agricultural corporation Please specify: 5. Other incorporated body Please specify: 6. Agricultural cooperative	7. Other cooperative 8. Specified agricultural organization 9. Municipal body 10. Other organization Please specify: 11. Other Please specify:
Number of employees	Total employees: Regular employees:	
Industry	1. Agriculture 2. Forestry 3. Fisheries 4. Mining, quarrying, sand and gravel extraction 5. Construction 6. Food manufacturing	12. Finance, insurance 13. Real estate, leasing 14. Academic research, expert/technical services 15. Accommodation, food and beverage services 16. Lifestyle services, entertainment 17. Education, learning support 18. Medical care, welfare

	<p>7. Manufacturing other than food</p> <p>8. Electricity / gas / heat supply / water utilities</p> <p>9. Information and communications</p> <p>10. Transportation, postal services</p> <p>11. Wholesale, retail</p> <p>19. Composite services</p> <p>20. Services not categorized elsewhere</p> <p>21. Public affairs not categorized elsewhere</p> <p>22. Other (please specify):</p>
Job title and department of person completing this form	

End of survey. Thank you for your cooperation.

Survey of Career Paths of Alumni in the Field of Agriculture

Screening Questions

S1. Please indicate your highest educational qualification. (Select one response)

- 1 Junior High School
- 2 Senior High School
- 3 Vocational School, Advanced Vocational School
- 4 Higher Professional School
- 5 Junior College
- 6 University (Bachelor's Degree)
- 7 Graduate School Master's Degree
- 8 Graduate School Doctoral Degree (excluding doctoral degree obtained based solely on a thesis (without attending a doctoral program) and coursework completion without degree)
- 9 Other (please specify):

⇒ Please proceed with the following questions if you selected 6, 7 or 8 (survey ends here for respondents who selected other options)

S2. Please indicate which of the following best describes the faculty/department (or graduate school/department) at which you obtained your highest educational qualification. (Select one response)

- 1 Literature/philosophy/psychology
- 2 Language/linguistics
- 3 Sociology
- 4 Economics/management
- 5 Law
- 6 Political science/history
- 7 Education
- 8 Foreign languages
- 9 International relations/international communication
- 10 Media/communication
- 11 Science
- 12 Engineering
- 13 Architecture/civil engineering
- 14 Informatics
- 15 Medicine
- 16 Dentistry
- 17 Pharmacy
- 18 Nursing/welfare
- 19 Agriculture (including bio-resources, bio-environmental science, applied biology, forestry science, textiles, etc.)
- 20 Fisheries science
- 21 Veterinary science, zoology
- 22 Nutritional science (excluding agriculture)
- 23 Environmental science (excluding agriculture)
- 24 Arts
- 25 Physical education/health/health science
- 26 Travel/tourism

- | | |
|----|--------------------------------|
| 27 | Accounting, business marketing |
| 28 | Other |

⇒ Please proceed with the following questions if you selected 19, 20 or 21 (survey ends here for respondents who selected other options)

S3. Please indicate which of the following best describes your current work status. (Select one response)

- | | |
|----|---|
| 1 | Self-employed |
| 2 | Proprietor/executive |
| 3 | Public servant |
| 4 | Regular employee of a company/organization, etc. |
| 5 | Contract (non-regular) employee of a company/organization, etc. |
| 6 | Temporary dispatch worker |
| 7 | Casual/part-time worker |
| 8 | Student |
| 9 | Home duties |
| 10 | Not working |
| 11 | Other |

⇒ Please proceed with the following questions if you selected 3 or 4 (survey ends here for respondents who selected other options)

Main Survey

I. Your Current Status

Q1. Please indicate your gender. (Select one response)

1	Male	2	Female
---	------	---	--------

Q2. Please state your age.
years

Q3. Please indicate the region in which you live.
*Pull-down menu selection of 47 prefectures

Q4. Please indicate the number of employees in your place of work. (Select one response)

1	9 or less
2	10-29
3	30-49
4	50-99
5	100-299
6	300-999
7	1000 or more
8	Not a private company (please explain):
9	Don't know

Q5. Please select which of the following best describes your current work duties. (Select one option)

1. Research	7. Procurement	13. MR
2. Development	8. Planning	14. Sales
3. Production engineering	9. Sales engineering	15. Clerical
4. Manufacturing	10. Marketing	16. Farming
5. Production management	11. Consulting	17. Teaching
6. Quality control	12. System engineering	18. Other (please specify):

Q6. Please select which of the following best describes the field (industry) in which you work. (Select one response)

1. Agriculture
2. Forestry
3. Fisheries
4. Mining, quarrying, sand and gravel extraction
5. Construction
6. Food manufacturing
7. Manufacturing other than 6 (please specify):
8. Electricity / gas / heat supply / water utilities
9. Information and communications
10. Transportation, postal services
11. Wholesale, retail
12. Finance, insurance
13. Real estate, leasing
14. Academic research, expert/technical services
15. Accommodation, food and beverage services

16. Lifestyle services, entertainment
17. Education, learning support
18. Medical care, welfare
19. Cooperative associations, etc.
20. Services not categorized elsewhere (please specify):
21. Public affairs not categorized elsewhere
22. Other (please specify):

Q6-2. If possible, please provide the name of the organization at which you work currently. (One response only)

Q7. Have you ever changed employers?

- | | | | |
|---|------------------------------------|---|----|
| 1 | Yes (state number of times:) | 2 | No |
|---|------------------------------------|---|----|

Q8. Do you find your current work duties rewarding? (Select one response)

- | | |
|---|--------------|
| 1 | Yes |
| 2 | Somewhat yes |
| 3 | Somewhat no |
| 4 | Generally no |

Q9. Please indicate your annual salary range. (Select one response)

- | | |
|----|--------------------------|
| 1 | 2.99 million yen or less |
| 2 | 3.00 to 3.99 million yen |
| 3 | 4.00 to 4.99 million yen |
| 4 | 5.00 to 5.99 million yen |
| 5 | 6.00 to 6.99 million yen |
| 6 | 7.00 to 7.99 million yen |
| 7 | 8.00 to 8.99 million yen |
| 8 | 9.00 to 9.99 million yen |
| 9 | 10 million yen or more |
| 10 | Do not wish to respond |

II. Relationship between Your Current Job and Your Studies at University/Graduate School

Q10. Please select which of the following best describes the primary academic discipline of the research lab or specialized research seminar with which you were affiliated at your highest level of education. If you were unaffiliated, select the discipline that you focused on most. (Select one response)

- | | |
|---|---|
| 1 | Agricultural Chemistry |
| 2 | Production Agriculture |
| 3 | Zootechnical Science |
| 4 | Veterinary Science |
| 5 | Fisheries Science |
| 6 | Forestry Science / Forestry Product Science |
| 7 | Agricultural Economics |
| 8 | Agricultural Engineering |
| 9 | Other (please specify): |

Q10-1. If possible, please explain the details of your selection (primary academic discipline or theme) in Q10. (Free response)

Q11. To what extent is the 'primary academic discipline of the research lab or specialized research seminar' you selected in Q10 related to your current work (job)? (Choose one response)

- | | |
|---|-----------------------|
| 1 | Related |
| 2 | Somewhat related |
| 3 | Generally not related |
| 4 | Not related |

Q12. Please indicate which academic discipline is most closely related to your current work (job). (Circle one response)

- 1 Agricultural Chemistry
- 2 Production Agriculture
- 3 Zootechnical Science
- 4 Veterinary Science
- 5 Fisheries Science
- 6 Forestry Science / Forestry Product Science
- 7 Agricultural Economics
- 8 Agricultural Engineering
- 10 Other (please specify):
- 11 Other discipline connected with agriculture (please specify):
- 12 Not closely related to any discipline connected with agriculture

Q12-1. If possible, please briefly explain your current work (job). (Free response)

Q13. When you were at university, did you have the impression that the 'primary academic discipline of the research lab or specialized research seminar' you selected in Q10 would be useful and connected to work after graduation? (Select one response)

- 1 I thought it would be useful, and it has turned out to be useful
- 2 I thought it would be useful, but it hasn't turned out to be useful
- 3 I didn't think it would be useful
- 4 I never thought about it

Q14. What experiences at university/graduate school have proved useful in your current job? (Select all that apply)

- 1 Lecture courses (general)
- 2 Lecture courses (specialized)
- 3 Fieldwork courses
- 4 Laboratory courses
- 5 Practicum courses
- 6 Seminars in research labs, etc.
- 7 Graduation research / thesis writing
- 8 Internships (for credit)
- 9 Internships (not for credit)
- 10 Part-time work
- 11 Club and volunteer activities
- 12 Study abroad
- 13 Other (please specify):
- 14 University studies/experiences have not proved useful

Q15. In what way have experiences at university/graduate school proved useful in your current job? (Select all that apply)

- | | |
|----|--|
| 1 | I could acquire specialized knowledge fundamental for work |
| 2 | I could acquire technical skills fundamental for work |
| 3 | I could acquire specialized knowledge directly applicable to work |
| 4 | I could gain a systematic, integrated grasp of the nature of the industry/area of employment |
| 5 | I could acquire proficiency in work methods (practical tasks, research methods, etc.) |
| 6 | I could acquire capacity to coordinate among different fields and areas |
| 7 | I could develop the positivity and sincerity required in the workplace |
| 8 | I could develop habits of study and research |
| 9 | Other (please specify): |
| 10 | University experiences have not proved useful at all |

Q16. Please indicate the types of practical training you experienced at university/graduate school that have proved useful in your current job? (Select all that apply)

<u>Laboratory</u>	<u>Fieldwork</u>	<u>Information science</u>
1. Bioscience experiments	6. Farm fieldwork	11. Bioscientific simulations, etc.
2. Chemistry experiments	7. Forestry fieldwork	12. Simulations of farms, forests, water environments, global environment, etc.
3. Physics experiments	8. Marine fieldwork	13. Other (please specify):
4. Clinical animal (veterinary) training	9. Fieldwork in farming, forestry or fisheries village, company, or local community	
5. Other (please specify):	10. Other (please specify):	

III. Studies at University/Graduate School

Q17. In the department in which you undertook your highest level of education, to what extent did you engage in (1) class-based study, and (2) research activities in research labs? (Select one response for each)

- | | |
|---|---------------------|
| 1 | Engaged seriously |
| 2 | Engaged somewhat |
| 3 | Did not engage much |
| 4 | Did not engage |

Q18. In your highest level of education, did you engage seriously in study in the 'primary academic discipline of the research lab or specialized research seminar' you selected in Q10? (Select one response)

- | | |
|---|---------------------|
| 1 | Engaged seriously |
| 2 | Engaged somewhat |
| 3 | Did not engage much |
| 4 | Did not engage |

Q19. To what extent did you acquire each of the following capabilities through your studies/experiences at university/graduate school? (Select one response for each)

	Acquired	Somewhat acquired	Neutral	Not acquired much	Not acquired
a. Specialized knowledge / academic ability in specialized subjects	1	2	3	4	5
b. Basic academic abilities / general education	1	2	3	4	5
c. Foreign language (e.g. English) proficiency	1	2	3	4	5
d. Understanding of and adaptability to work	1	2	3	4	5
e. Reporting/communication/consultation at work	1	2	3	4	5
f. Ability to communicate with a variety of people	1	2	3	4	5
g. Willingness to tackle tasks independently without being asked	1	2	3	4	5
h. Teamwork, cooperativeness	1	2	3	4	5
i. Ability to operate computers, etc.	1	2	3	4	5
j. Formal qualifications Name of qualification(s) obtained:	1	2	3	4	5
k. Knowledge of other cultures and business customs beyond Japan	1	2	3	4	5
l. Knowledge of agriculture-related fields beyond Japan	1	2	3	4	5

Q20. What are your thoughts regarding the education in the field of agriculture that you received at university?
(For each statement from A through E, select one response: Agree / Somewhat Agree / Neutral / Somewhat Disagree / Disagree)

- | | |
|---|---|
| A | I would have liked instructors to reflect their research findings more in class content |
| B | I would have liked more general education courses |
| C | I would have liked more specialist courses |
| D | I would have liked more practical training |
| E | I would have liked more thesis guidance in research labs |

Q21. Please write freely about your opinions and requests concerning university / graduate school education in the field of agriculture. (Free response)

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End of survey. Thank you for your cooperation.

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture
-- Curriculum Survey (Undergraduate) --

Request for Cooperation

This questionnaire is to be completed by the undergraduate faculty/college Dean or equivalent organizational unit head.

As part of an Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Tokyo University of Agriculture and Technology is conducting a questionnaire survey in order to solicit views on the current state of agriculture curricula in universities and graduate schools. Individual responses will not be made public under any circumstances without consulting the respondent. The findings of this study are to be used as reference by MEXT when planning university education initiatives in the future. We ask for your kind cooperation based on understanding of the purpose of the study. We understand that you may find it difficult to respond to some questions in certain circumstances. Please feel free to leave the answer section blank in such cases.

Please note that tabulation of questionnaire responses is handled by a private survey research firm, Libertas Consulting Co., Ltd.

When you have completed the questionnaire, **please forward it to the person responsible for collecting questionnaire responses in your university.**

Points to note when completing the questionnaire

- Please respond in relation to the 2015 academic year unless specifically requested otherwise. If you are planning major changes from the 2016 academic year, we would be grateful if you could complete another questionnaire relating to 2016 (this is not essential; responses for 2015 only are adequate).
- When entering department names in Question 2, if programs offered within the same department differ considerably in academic content, please add the names of the programs as well as the department name.

Survey commissioned by:

Higher Education Bureau, Ministry of Education, Culture, Sports, Science and Technology

Survey conducted by:

Tokyo University of Agriculture and Technology

Inquiries:

Survey Secretariat (Libertas Consulting Co., Ltd.)

Staff in charge: Hatta, Kikuchi, Sobajima

E-mail: nougaku@libertas.co.jp

Telephone: 0120-575-332

0 Respondent Profile

University	Enter your response here
Faculty/college	Enter your response here
Address	Enter your response here
Job Title	Enter your response here
Name	Enter your response here
Telephone	Enter your response here
E-mail Address	Enter your response here

I. Your Faculty's Curriculum

Q1. Please state your faculty's education and research goals, human resource development ideals (or educational objectives) and diploma policy. (Free format)

Education and research goals	
Human resource development ideals (or educational objectives)	
Diploma policy	

Q2. Does your faculty offer courses in any of the seven basic agricultural disciplines* shown below? Please enter the names of departments that either (1) have a core curricular focus on the discipline or (2) offer the discipline but not as a core focus. (Free format)

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)
<http://www.sci.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Discipline		Outline	Examples of courses offered	(1) Departments with a core curricular focus on this discipline	(2) Departments offering this discipline but not as a central focus
1. Agricultural Chemistry		Studies directed to explication of the bio-mechanisms of animals, plants and microorganisms from individual to molecular levels, and discovery and development of applications for a diversity of chemical substances that govern biological activity.	Natural Organic Chemistry, Molecular Biology, Enzymology, Microbiology, Zymology Botany, Zoology, Food Science, Information Science, etc.		
2. Production Agriculture		Natural Organic Chemistry, Molecular Biology, Enzymology, Microbiology, Zymology Botany, Zoology, Food Science, Information Science, etc.	Crop Science, Horticulture, Agronomics, Breeding, Soil Science and Plant Nutrition, Plant Pathology, Applied Zoology and Entomology, Weed Science, Agroecology, Landscape Architecture, Landscape and Ecology Planning, Sericultural Science and Applied Entomology, etc.		
3.	Zootechnical Science	Basic life sciences and applied zoological sciences related to industrial animals (livestock, poultry, insects), companion animals, wild animals, laboratory animals, etc.	Overview of Zootechnical Science, Animal Husbandry, Animal Breeding, Animal Breeding Management, Animal Nutrition, Animal Physiology, Animal Anatomy, Animal Microbiology, Animal Immunology, Animal Hygienics, Theriogenology, Wildlife Zoology, etc.		
	Veterinary Science	The study of diseases and injuries in animals other than humans, and their medical treatment, physiology, hygiene, etc.	Veterinary Ethics and Laws, Anatomy, Histology, Physiology, Veterinary Breeding and Genetics, Laboratory Animals, Pharmacology, Animal Pathology, Hygiene, Epidemiology, Toxicology, etc.		
4. Fisheries Science		Studies directed to the explication of the mechanisms and dynamics of biofunctions and bioproduction in the wide variety of organisms that inhabit oceans, lakes and rivers, together with their sustainable development, use and management for food production and other renewable resource purposes and the conservation of aquatic environments as a foundation therefor.	Marine Environment, Physiology and Ecology of Organisms, Fisheries and Aquaculture, Use and Processing, Economics and Management of Fisheries, Logistics, Fishing Communities, Fisheries Policy, etc.		
5. Forestry Science / Forestry Product Science		Studies of forests and forest resources such as timber and fungi, directed to the explication of diversity and maintenance mechanisms of forest ecologies; the conservation and use of the multiple functions of forests including land conservation, carbon dioxide absorption, and human health and leisure; the revitalization of forestry and forestry products as industries using forests and forestry products sustainably; and research and development in timber science and technology.	Silviculture, Forestry Policy, Erosion Control Engineering, Forest Ecology, Forest Engineering, Forest Product Manufacturing, Forest Product Science, Other (please specify):		
6. Agricultural Economics		Studies of problems concerning agriculture, food, rural communities, resources, and environments globally and within Japan, directed to analysis using methods from economics and other humanities and social sciences, identification of actual social conditions, and formulation of methods and means to address the problems.	Agricultural Economics, Agriculture Policy, Agricultural Management, Agricultural History, Cooperative Associations, Rural Sociology, etc.		
7. Agricultural Engineering		The use of engineering approaches and methods to address problems in agriculture. Involves studying the reciprocal systems of biological, environmental and human activity in order to achieve advancements in production infrastructure while building sustainable societies in harmony with nature.	Agricultural and Rural Engineering, Rural Planning, Agricultural Mechanics, Post-Harvest Engineering, Agricultural Meteorology, Bioenvironmental Engineering, Agricultural Structures, Agricultural Informatics, Ecological Engineering		
Other (please name below)		(Please provide an outline)	(Please list course examples)		

Q3. For each of the seven basic disciplines of agriculture* represented in your faculty, please select the option below that best describes the degree of local character in the educational curriculum.

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)

<http://www.sci.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Options

- (1) Content has extremely strong local character
- (2) Content has rather strong local character
- (3) Content has some local character
- (4) Content is standard with little local character
- (5) None of our departments offer courses in this discipline

	Select option (pull-down menu)
Agricultural Chemistry	
Production Agriculture	
Zootechnical Science	
Veterinary Science	
Fisheries Science	
Forestry Science / Forestry Products Science	
Agricultural Economics	
Agricultural Engineering	
Others (if you listed others in Q2)	

<学部調査票案>

		Agricultural high school
		National, municipal, or private university
		Agricultural corporation
		Agriculture-related corporation
		Agricultural cooperative
		Other company
		Overseas institution Details:
		Other Details:

Q8. Please explain any roles or projects (including lifelong learning activities) your faculty is undertaking in the local community in which your university is located. (Free format)

Q9. Please comment on directions and prospects for local partnerships into the future. (Free format)

III. Roles in Agricultural Technology Dissemination in the Local Community

Q10. Please select the option below that best describes your faculty's role in the dissemination of agricultural technology in your local community (the area in which your university is located). (Pull-down menu)

Options

- (1) We play an organized role as a center for agricultural technology dissemination
- (2) We play a role in the course of faculty members' education and research activities
- (3) We do not play any particular role

Option (pull-down menu)	
-------------------------	--

Q11. For each of the seven basic disciplines of agriculture* represented in your faculty, please select the option that best describes the degree to which your faculty is involved in the dissemination of agricultural technology in your local community (the area in which your university is located). (Pull-down menu selection for all disciplines)

*Based on the Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education, Science Council of Japan (URL below)

<http://www.sci.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Options

- (1) We play a very large role
- (2) We play some role
- (3) We do not play a role, and there are no local needs to fill
- (4) We do not play a role, but there are local needs to fill
- (5) None of our departments operate in this discipline

	Select option (pull-down menu)
Agricultural Chemistry	
Production Agriculture	
Zootechnical Science	
Veterinary Science	
Fisheries Science	
Forestry Science / Forestry Products Science	
Agricultural Economics	
Agricultural Engineering	
Others (if you listed others in Q2)	

Q12. Please comment on the roles played by facilities affiliated with your university (experimental farms, training forests, livestock clinics, training vessels, etc.) in the dissemination of agricultural technology in your local community. (Free format)

(We would be grateful for your response to the following question, if possible)

Supplementary Q. Please provide a brief outline of the content of any staff development activities undertaken by your faculty or university as a whole (such as training designed to enhance the capabilities of administrative staff, technical staff or support organizations engaged in management and administration or educational and research support). (Free format)

End of survey. Thank you for your cooperation.

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture
-- Curriculum Survey (Graduate School) --

Request for Cooperation

This questionnaire is to be completed by the graduate school Dean or equivalent organizational unit head.

As part of an Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Tokyo University of Agriculture and Technology is conducting a questionnaire survey in order to solicit views on the current state of agriculture curricula in universities and graduate schools. Individual responses will not be made public under any circumstances without consulting the respondent. The findings of this study are to be used as reference by MEXT when planning university education initiatives in the future. We ask for your kind cooperation based on understanding of the purpose of the study. We understand that you may find it difficult to respond to some questions in certain circumstances. Please feel free to leave the answer section blank in such cases.

Please note that tabulation of questionnaire responses is handled by a private survey research firm, Libertas Consulting Co., Ltd.

When you have completed the questionnaire, **please forward it to the person responsible for collecting questionnaire responses in your university.**

Points to note when completing the questionnaire

- If your Master's and Doctoral degree programs (including joint graduate schools) are operated by structurally separate entities such as different graduate schools, or if you have an Integrated Master's/Doctoral degree program, please provide separate answers for the Master's program and Doctoral or Integrated Master's/Doctoral program. In cases such as these, please use two separate questionnaire forms and complete them separately for Master's programs and the Doctoral and Integrated Doctoral programs.
- Please respond in relation to the 2015 academic year unless specifically requested otherwise. If you are planning major changes from the 2016 academic year, we would be grateful if you could complete another questionnaire relating to 2016 (this is not essential; responses for 2015 only are acceptable).
- When entering department names in Question 2, if programs offered within the same department differ considerably in academic content, please add the names of the programs as well as the department name.

Survey commissioned by:

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Survey conducted by:

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Inquiries:

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Staff in charge: Hatta, Kikuchi, Sobajima

E-mail : nougaku@libertas.co.jp

Telephone: 0120-575-332

0 Respondent Profile

University	Enter your response here
Graduate School	Enter your response here
Address	Enter your response here
Job Title	Enter your response here
Name	Enter your response here
Telephone	Enter your response here
E-mail Address	Enter your response here

I. Your Graduate School's Curriculum

Q1. Please state your graduate school's education and research goals, human resource development ideals (or educational objectives) and diploma policy. (Free format)

Education and research goals	
Human resource development ideals (or educational objectives)	
Diploma policy	

Q2. Does your graduate school offer courses in any of the seven basic agricultural disciplines* shown below? Please enter the names of departments that either (1) have a core curricular focus on the discipline or (2) offer the discipline but not as a core focus. (Free format)

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)

<http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Discipline	Outline	Examples of courses offered	(1) Departments with a core curricular focus on this discipline	(2) Departments offering this discipline but not as a central focus
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2. Production Agriculture	Natural Organic Chemistry, Molecular Biology, Enzymology, Microbiology, Zymology Botany, Zoology, Food Science, Information Science, etc.	Crop Science, Horticulture, Agronomics, Breeding, Soil Science and Plant Nutrition, Plant Pathology, Applied Zoology and Entomology, Weed Science, Agroecology, Landscape Architecture, Landscape and Ecology Planning, Sericultural Science and Applied Entomology, etc.		
3.	Zootechnical Science	Basic life sciences and applied zoological sciences related to industrial animals (livestock, poultry, insects), companion animals, wild animals, laboratory animals, etc.	Overview of Zootechnical Science, Animal Husbandry, Animal Breeding, Animal Breeding Management, Animal Nutrition, Animal Physiology, Animal Anatomy, Animal Microbiology, Animal Immunology, Animal Hygienics, Theriogenology, Wildlife Zoology, etc.	
	Veterinary Science	The study of diseases and injuries in animals other than humans, and their medical treatment, physiology, hygiene, etc.	Veterinary Ethics and Laws, Anatomy, Histology, Physiology, Veterinary Breeding and Genetics, Laboratory Animals, Pharmacology, Animal Pathology, Hygiene, Epidemiology, Toxicology, etc.	
4. Fisheries Science	Studies directed to the explication of the mechanisms and dynamics of biofunctions and bioproduction in the wide variety of organisms that inhabit oceans, lakes and rivers, together with their sustainable development, use and management for food production and other renewable resource purposes and the conservation of aquatic environments as a foundation therefor.	Marine Environment, Physiology and Ecology of Organisms, Fisheries and Aquaculture, Use and Processing, Economics and Management of Fisheries, Logistics, Fishing Communities, Fisheries Policy, etc.		
5. Forestry Science / Forestry Product Science	Studies of forests and forest resources such as timber and fungi, directed to the explication of diversity and maintenance mechanisms of forest ecologies; the conservation and use of the multiple functions of forests including land conservation, carbon dioxide absorption, and human health and leisure; the revitalization of forestry and forestry products as industries using forests and forestry products sustainably; and research and development in timber science and technology.	Silviculture, Forestry Policy, Erosion Control Engineering, Forest Ecology, Forest Engineering, Forest Product Manufacturing, Forest Product Science, Other (please specify):		
6. Agricultural Economics	Studies of problems concerning agriculture, food, rural communities, resources, and environments globally and within Japan, directed to analysis using methods from economics and other humanities and social sciences, identification of actual social conditions, and formulation of methods and means to address the problems.	Agricultural Economics, Agriculture Policy, Agricultural Management, Agricultural History, Cooperative Associations, Rural Sociology, etc.		
7. Agricultural Engineering	The use of engineering approaches and methods to address problems in agriculture. Involves studying the reciprocal systems of biological, environmental and human activity in order to achieve advancements in production infrastructure while building sustainable societies in harmony with nature.	Agricultural and Rural Engineering, Rural Planning, Agricultural Mechanics, Post-Harvest Engineering, Agricultural Meteorology, Bioenvironmental Engineering, Agricultural Structures, Agricultural Informatics, Ecological Engineering		
Other (please name below)	(Please provide an outline)	(Please list course examples)		

Q3. For each of the seven basic disciplines of agriculture* represented in your graduate school, please select the option below that best describes the degree of local character in the educational curriculum.

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)

<http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Options
(1) Content has extremely strong local character
(2) Content has rather strong local character
(3) Content has some local character
(4) Content is standard with little local character
(5) None of our departments offer courses in this discipline

	Select option (pull-down menu)
Agricultural Chemistry	
Production Agriculture	
Zootechnical Science	
Veterinary Science	
Fisheries Science	
Forestry Science / Forestry Products Science	
Agricultural Economics	
Agricultural Engineering	
Others (if you listed others in Q2)	

Q4. For each of the seven basic disciplines of agriculture* represented in your graduate school, please select the option below that best describes the degree of emphasis to be placed on education of that discipline from now on. (Pull-down menu selection for all disciplines)

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)

<http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Options

- (1) We plan to place particular emphasis on this discipline from now on
- (2) We will continue to place emphasis on this discipline as before
- (3) We will not place much emphasis from now on this discipline
- (4) None of our departments offer courses in this discipline

	Select option (pull-down menu)
Agricultural Chemistry	
Production Agriculture	
Zootechnical Science	
Veterinary Science	
Fisheries Science	
Forestry Science / Forestry Products Science	
Agricultural Economics	
Agricultural Engineering	
Others (if you listed others in Q2)	

Q5. Does your graduate school undertake any of the following activities to evaluate courses from the students' perspective? (Mark ☐ for any that apply)

<input type="checkbox"/>	(1) Student course evaluation surveys
<input type="checkbox"/>	(2) Student organizations such as student faculty development teams, educational enhancement officers, etc.
<input type="checkbox"/>	(3) Student planning of curricular courses
<input type="checkbox"/>	(4) Student participation in faculty development activities

Q6-1. Please indicate whether you have adopted or intend to adopt the following systems. Select from the options shown below. (Answer for each of a, b and c)

Options

- (1) Adopted
- (2) Not yet adopted but plan to adopt
- (3) Currently considering adoption
- (4) No plans to adopt

	Select option (pull-down menu)
a. Changes in academic calendar (four-term)	
b. Course numbering*	
c. Double degrees	

*Assigning a meaningful number to each curricular course to reflect the systematic structure of the curriculum.

Q6-2. If you indicated in Q6-1a that you have adopted or are considering adoption of changes in academic calendar, please explain the reasons for doing so. Please also explain the reasons if you have adopted or are considering adoption of either of the systems in Q6-1b and c. (Free format)

II. Connections with the Local Community as an Agricultural Education and Research Institution

Q7. This question concerns your external partnerships.

(1) Please indicate if your graduate school has educational partnerships with any of the following institutions/organizations. (Mark ☐ for any that apply)

(2) Please indicate if your graduate school has joint research partnerships with any of the following institutions/organizations. (Mark ☐ for any that apply)

(1)	(2)	
E	J	
d	o	
u	u	
c	n	
a	r	
t	e	
i	s	
i	e	
n	s	
	r	
	c	
	h	
		National government
		Local government
		Agricultural or livestock experiment station
		Prefectural college of agriculture
		Agricultural high school
		National, municipal, or private university

<学部調査票案>

		Agricultural corporation
		Agriculture-related corporation
		Agricultural cooperative
		Other company
		Overseas institution Details:
		Other Details:

Q8. Please explain any roles or projects (including lifelong learning activities) your graduate school is undertaking in the local community in which your university is located. (Free format)

Q9. Please comment on directions and prospects for local partnerships into the future. (Free format)

III. Roles in Agricultural Technology Dissemination in the Local Community

Q10. Please select the option below that best describes your graduate school's role in the dissemination of agricultural technology in your local community (the area in which your university is located). (Pull-down menu)

Options

- (1) We play an organized role as a center for agricultural technology dissemination
- (2) We play a role in the course of faculty members' education and research activities
- (3) We do not play any particular role

Option (pull-down menu)	
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Q11. For each of the seven basic disciplines of agriculture* represented in your graduate school, please select the option that best describes the degree to which your graduate school is involved in the dissemination of agricultural technology in your local community (the area in which your university is located). (Pull-down menu selection for all disciplines)

*Based on the Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education, Science Council of Japan (URL below)

<http://www.sci.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Options

- (1) We play a very large role
- (2) We play some role
- (3) We do not play a role, and there are no local needs to fill
- (4) We do not play a role, but there are local needs to fill
- (5) None of our departments operate in this discipline

	Select option (pull-down menu)
Agricultural Chemistry	
Production Agriculture	
Zootechnical Science	
Veterinary Science	
Fisheries Science	
Forestry Science / Forestry Products Science	
Agricultural Economics	
Agricultural Engineering	
Others (if you listed others in Q2)	

Q12. Please comment on the roles played by facilities affiliated with your university (experimental farms, training forests, livestock clinics, training vessels, etc.) in the dissemination of agricultural technology in your local community. (Free format)

(We would be grateful for your response to the following question, if possible)

Supplementary Q. Please provide a brief outline of the content of any staff development activities undertaken by your graduate school or university as a whole (such as training designed to enhance the capabilities of administrative staff, technical staff or support organizations engaged in management and administration or educational and research support). (Free format)

End of survey. Thank you for your cooperation.

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture
-- Curriculum Survey (Undergraduate Departments) --

Request for Cooperation

This questionnaire is to be completed by undergraduate department heads or equivalent organizational unit heads.

As part of an Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Tokyo University of Agriculture and Technology is conducting a questionnaire survey in order to solicit views on the current state of agriculture curricula in universities and graduate schools. Individual responses will not be made public under any circumstances without consulting the respondent. The findings of this study are to be used as reference by MEXT when planning university education initiatives in the future. We ask for your kind cooperation based on understanding of the purpose of the study. We understand that you may find it difficult to respond to some questions in certain circumstances. Please feel free to leave the answer section blank in such cases.

Please note that tabulation of questionnaire responses is handled by a private survey research firm, Libertas Consulting Co., Ltd.

When you have completed the questionnaire, **please forward it to the person responsible for collecting questionnaire responses in your university.**

Points to note when completing the questionnaire

- Please respond in relation to the 2015 academic year unless specifically requested otherwise. If you are planning major changes from the 2016 academic year, we would be grateful if you could complete another questionnaire relating to 2016 (this is not essential; responses for 2015 only are adequate).
- Please complete one questionnaire per department. If programs offered within the same department differ considerably in academic content, we would be grateful if you could complete a separate questionnaire for each department. In such cases, the word "department" in the questionnaire should be read as "program," etc.

Survey commissioned by:

Higher Education Bureau, Ministry of Education, Culture, Sports, Science and Technology

Survey conducted by:

Tokyo University of Agriculture and Technology

Inquiries:

Survey Secretariat (Libertas Consulting Co., Ltd.)

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0 Respondent Profile

University	Enter your response here
Faculty/College	Enter your response here
Department	Enter your response here
Job Title	Enter your response here
Name	Enter your response here
Telephone	Enter your response here
E-mail Address	Enter your response here

I. Basic Data on Your Department's Academic Staff

Q1. Please state the number of faculty members (academic staff members) in your department in the 2015 academic year. (Enter your responses as numerals)

Number of full-time faculty members	
Professors	
Associate Professors	
Lecturers	
Assistant Professors	
Full-time faculty members with work experience outside the university sector	
Number of part-time faculty members	
Part-time faculty members whose main job is outside the university sector	

*Please enter figures as of May 1, 2015, as reported in the School Basic Survey.

II. Employment of Graduates of Your Department

Q2. Please enter the following information concerning graduates of your department in the 2014 academic year. (Enter your responses as numerals)

Total number of graduates	
Graduates securing employment	
Graduates proceeding to further study	

*Please enter figures as of May 1, 2015, as reported in the School Basic Survey.

Q3. Approximately what proportion of the graduates of your department secure employment within the prefecture in which your university is located? (Enter your response as a numeral)

Graduates securing employment within the prefecture		percent approx.
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Q4. Do you expect an increase in the proportion of graduates of your department securing employment within the prefecture in which your university is located? Answer this question based on your opinion as department head. (Pull-down menu selection)

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Q5. Do you hope that graduates of your department secure employment within the prefecture in which your university is located?
Answer this question based on your opinion as department head. (Pull-down menu selection)

Q6. If your department implements any initiatives to promote graduate employment within the prefecture in which you are located, please outline them below. (Free format)

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Q7. In regard to the career pathways of graduates of your department, please indicate if there has been an increase in any of the following fields or modes of work in recent years. Answer this question based on your opinion as department head. (Select O for any that apply)

<input type="checkbox"/>	Information technology
<input type="checkbox"/>	Trading company (Major)
<input type="checkbox"/>	Finance
<input type="checkbox"/>	Manufacturing other than agricultural machinery, food products, and textiles
<input type="checkbox"/>	Other (please specify):
<input type="checkbox"/>	Start farming (direct engagement in agriculture)
<input type="checkbox"/>	Work at an agricultural corporation
<input type="checkbox"/>	Work at an NPO
<input type="checkbox"/>	Work at an NGO
<input type="checkbox"/>	Entrepreneurship
<input type="checkbox"/>	Other (please specify):

Q8. For each of the items A through H below, please select the option that best describes your evaluation of the graduates of your department. Answer this question based on your opinion as department head. (Pull-down menu selection for each item A-H)

Options
(1) Excellent
(2) Very good
(3) Neutral
(4) Some further effort required
(5) Further effort required (problem area)

		Select option (pull-down menu)
A	Acquired specialized knowledge fundamental for work	
B	Acquired technical skills fundamental for work	
C	Acquired specialized knowledge directly applicable to work	
D	Gained a systematic, integrated grasp of the nature of the industry/area of employment	
E	Acquired proficiency in work methods (practical tasks, research methods, etc.)	
F	Acquired capacity to coordinate among different fields and areas	
G	Developed the positivity and serious attitude required in the workplace	
H	Developed habits of study and research	

III Course Content in Your Department

Q9. Please state your department's education and research goals, human resource development ideals (or educational objectives) and diploma policy. (Free format)

Education and research goals	
Human resource development ideals (or educational objectives)	
Diploma policy	

Q10. Does your department offer courses in any of the seven basic agricultural disciplines* shown below? Please select the symbol ☒ for those which are a core curricular focus, and ☐ for those which you offer but not as a core focus.

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)

<http://www.sci.go.jp/ia/info/kohyo/pdf/kohyo-23-h151009.pdf>

Response	Discipline	Outline	Example of courses offered
<input type="radio"/>	1. Agricultural Chemistry	Studies directed to explication of the bio-mechanisms of animals, plants and microorganisms from individual to molecular levels, and discovery and development of applications for a diversity of chemical substances that govern biological activity.	Natural Organic Chemistry, Molecular Biology, Zymology, Microbiology, Botany, Zoology, Food Science, Information Science, etc.
<input type="radio"/>	2. Production Agriculture	The disciplinary foundations of agriculture, addressing the production and use of crops, horticultural plants, etc. (including sericulture) related to food and energy resources and human lifestyles.	Crop Science, Horticulture, Agronomics, Breeding, Soil Science and Plant Nutrition, Plant Pathology, Applied Zoology and Entomology, Weed Science, Agroecology, Landscape Architecture, Landscape and Ecology Planning, Sericultural and Entomological Science, etc.
<input type="radio"/>	3. Zootechnical Science	Basic biosciences and applied zoological sciences related to industrial animals (livestock, poultry, insects), companion animals, wildlife, laboratory animals, etc.	Overview of Zootechnical Science, Animal Husbandry, Animal Breeding, Animal Breeding Management, Animal Nutrition, Animal Physiology, Animal Anatomy, Animal Microbiology, Animal Immunology, Animal Hygienics, Theriogenology, Wildlife Zoology, etc.
<input type="radio"/>	Veterinary Science	The study of diseases and injuries in animals other than humans, and their medical treatment, physiology, hygiene, etc.	Veterinary Ethics and Laws, Anatomy, Histology, Physiology, Veterinary Breeding and Genetics, Laboratory Animals, Pharmacology, Animal Pathology, Hygiene, Epidemiology, Toxicology, etc.
<input type="radio"/>	4. Fisheries Science	Studies directed to the explication of the mechanisms and dynamics of biofunctions and bioproduction in the wide variety of organisms that inhabit oceans, lakes and rivers, together with their sustainable development, use and management for food production and other renewable resource purposes and the conservation of aquatic environments as a foundation therefor.	Marine Environment, Physiology and Ecology of Organisms, Fisheries and Aquaculture, Use and Processing, Economics and Management of Fisheries, Logistics, Fishing Communities, Fisheries Policy, etc.
<input type="radio"/>	5. Forestry Science / Forestry Product Science	Studies of forests and forest resources such as timber and fungi, directed to the explication of diversity and maintenance mechanisms of forest ecologies; the conservation and use of the multiple functions of forests including land preservation, carbon dioxide absorption, and human health and leisure; the revitalization of forestry and forestry products as industries using forests and forestry products sustainably; and research and development in timber science and technology.	Silviculture, Forestry Policy, Erosion Control Engineering, Forest Ecology, Forest Engineering, Forest Product Manufacturing, Forest Product Science, Other (please specify):
<input type="radio"/>	6. Agricultural Economics	Studies of problems concerning agriculture, food, rural communities, resources, and environments globally and within Japan, directed to analysis using methods from economics and other humanities and social sciences, identification of actual social conditions, and formulation of methods and means to address the problems.	Agricultural Economics, Agriculture Policy, Agricultural Management, Agricultural History, Cooperative Associations, Rural Sociology, etc.

	7. Agricultural Engineering	The use of engineering approaches and methods to address problems in agriculture. Involves studying the reciprocal systems of biological, environmental and human activity in order to achieve advancements in production infrastructure while building sustainable societies in harmony with nature.	Agricultural and Rural Engineering, Rural Planning, Agricultural Mechanics, Post-Harvest Engineering, Agricultural Meteorology, Bioenvironmental Engineering, Agricultural Structures, Agricultural Informatics, Ecological Engineering
	Other (please name below)	(Please provide an outline)	(Please list course examples)

Q11. For each year level in your department, please indicate the approximate proportion of the curriculum devoted to (1) lectures, (2) practicum, and (3) laboratory/fieldwork. (Indicate each as a proportion of 10)

	(1) Lectures	(2) Practicum	(3) Laboratory / Fieldwork	Total	
a. First year				10	0
b. Second year				10	0
c. Third year				10	0
d. Fourth year				10	0

Q12. Does your department offer any of the following types of fieldwork/practicum classes? Please select ☐ for those that you offer.

<input type="checkbox"/>	Scientific labora- tory methods	Bioscience experiments
<input type="checkbox"/>		Chemistry experiments
<input type="checkbox"/>		Physics experiments
<input type="checkbox"/>		Clinical animal (veterinary) experiments
<input type="checkbox"/>		Other (please specify):
<input type="checkbox"/>	Scientific field methods	Farm fieldwork
<input type="checkbox"/>		Forestry fieldwork
<input type="checkbox"/>		Marine fieldwork
<input type="checkbox"/>		Fieldwork in farming, forestry or fisheries village, company, or local community
<input type="checkbox"/>		Other (please specify):
<input type="checkbox"/>	Informa- tion science methods	Bioscientific simulations, etc.
<input type="checkbox"/>		Simulations of farms, forests, water environments, global environment, etc.
<input type="checkbox"/>		Other (please specify):

Q13. Does your department have a fieldwork site? (Select ☐ for any that apply)

<input type="checkbox"/>	(1) Yes, on the university campus
<input type="checkbox"/>	(2) Yes, off-campus (within the same prefecture)
<input type="checkbox"/>	(3) Yes, off-campus (outside the prefecture)
<input type="checkbox"/>	(4) No

Q14. Does your department offer any classes in partnership with companies? (Select ☐ for the appropriate response)
If you chose "(2) Yes", please select the discipline in which the classes are offered, and briefly describe their content.
(For up to 5 of the major ones)

<input type="checkbox"/>	(1) No
<input type="checkbox"/>	(2) Yes

	Discipline	Content (free format)
1		
2		
3		
4		
5		

Q15. Does your department implement any of the following initiatives in order to understand the educational needs of industry?
(Select ☐ for any that apply)

<input type="checkbox"/>	(1) We develop curricula and teaching materials to reflect input from stakeholders such as companies, NGOs, and local government	
<input type="checkbox"/>	(2) We work in partnership with industry to set achievement standards pertaining to the knowledge and skills to be acquired at university	
<input type="checkbox"/>	(3) We furnish opportunities for university-industry dialogue in order to raise our graduates' awareness of career paths	
<input type="checkbox"/>	(4) We enable students to participate in joint research with companies, etc.	Approx. no. of students participating in AY 2015: <input type="text"/>

Q16. In regard to your department's curriculum, please indicate which of the following you are (1) currently enhancing, and (2) plan to enhance from now on. (Select ○ as appropriate)

		(1) Currently enhancing	(2) Plan to enhance
c R l e a g s u s l e a s r	a. Lecture courses (general)		
	b. Lecture courses (specialized)		
	c. Fieldwork courses		
	d. Laboratory courses		
	e. Practicum courses		
	f. Seminars in research labs, etc.		
	g. Graduation research / thesis writing		
	h. Internships (for credit)		
O t h e	i. Internships (not for credit)		
	j. Study abroad		

Q17. Please select the option below that best describes your department's students' degree of understanding of class content. (Pull-down menu selection)

Options

- (1) Almost all of our students understand class content
- (2) Around three quarters of our students understand class content well
- (3) Around half of our students understand class content well
- (4) Around one quarter of our students understand class content well
- (5) Almost none of our students understand class content

Selection	
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IV. Faculty Members' Research and Educational Activities

Q18. For each of the items below, please select the option that best describes your department's outlook and actual conditions regarding the research and educational activities of faculty members. Answer this question based on your opinion as department head. (Pull-down menu selection for each item A-D)

Options
(1) Agree
(2) Somewhat agree
(3) Neither agree or disagree
(4) Somewhat disagree
(5) Disagree

		Selection (pull-down menu)
A	Many faculty members tend to spend more time on research than education	
B	I would like faculty to spend more time on research than education	
C	When evaluating the performance of faculty members, we tend to place greater emphasis on research than education	

V Target Competencies

Q19. What competencies do you especially aim to cultivate through education in your department? Please select the symbol ◎ for the most prioritized competency, and ○ for any others that are applicable. Answer this question based on your opinion as department head.

<input type="checkbox"/>	(1) Ability to conduct innovative research and development with highly specialized expertise acquired at university
<input type="checkbox"/>	(2) Ability to perform technical roles mobilizing expertise acquired at university
<input type="checkbox"/>	(3) Ability to perform technical roles across a broad range of fields, making use of approaches and learning techniques acquired at university, even if not necessarily making direct use of the expertise acquired at university
<input type="checkbox"/>	(4) We are aware that graduates may end up working in areas unrelated to their specialization at university (and that awareness is reflected in the curriculum)
<input type="checkbox"/>	(5) We are aware that graduates may end up working in areas unrelated to their specialization at university (but that awareness may not be clearly reflected in the curriculum)
<input type="checkbox"/>	(6) Rather than emphasizing specialization, we aim to provide graduates with broad-based knowledge and skills and cultivate versatility, on the premise that they will engage in a wide variety of work in the future

Q20. In which of the following industries do you expect students in your department to find employment and work in the future? Answer this question based on your opinion as department head. (Select ○ for any that apply)

<input type="checkbox"/>	Conventional fields of employment for agriculture graduates	Agriculture-related company
<input type="checkbox"/>		Food-related company (manufacturing, wholesale/retail, dining)
<input type="checkbox"/>		Other chemistry-related company
<input type="checkbox"/>		Public service (national government, local government, etc.)
<input type="checkbox"/>		Teaching
<input type="checkbox"/>		Veterinary
<input type="checkbox"/>		Other (please specify):
<input type="checkbox"/>		Information technology
<input type="checkbox"/>	Industries other than agriculture, etc.	Trading company (Major)
<input type="checkbox"/>		Finance
<input type="checkbox"/>		Manufacturing other than agricultural machinery, food products, and textiles
<input type="checkbox"/>		Other (please specify):
<input type="checkbox"/>		Start farming (direct engagement in agriculture)
<input type="checkbox"/>		Work at an agricultural corporation
<input type="checkbox"/>	New modes of work	Work at an NPO
<input type="checkbox"/>		Work at an NGO
<input type="checkbox"/>		Entrepreneurship
<input type="checkbox"/>		Other (please specify):

VI Education for Undergraduate and Graduate Students in Agriculture-Related Fields

Q21. Please indicate which of the following problems your department faces in the education of students. Answer this question based on your opinion as department head. (Select O for any that apply)

<input type="checkbox"/>	(1) We cannot secure sufficient allocations (time) for classroom teaching
<input type="checkbox"/>	(2) We cannot secure sufficient allocations (time) for fieldwork, practicum etc.
<input type="checkbox"/>	(3) Faculty members are busy and cannot secure sufficient time for class preparation, etc.
<input type="checkbox"/>	(4) Faculty members are busy and cannot secure sufficient time for lab-based student guidance
<input type="checkbox"/>	(5) We want to enhance our fieldwork programs, but do not have a field site
<input type="checkbox"/>	(6) Students' motivation for learning and research is low
<input type="checkbox"/>	(7) It is difficult to conduct classes due to variation in student ability levels
<input type="checkbox"/>	(8) We do not know how to improve teaching and research guidance
<input type="checkbox"/>	(9) Faculty as a whole have low motivation to participate in faculty development activities, etc.
<input type="checkbox"/>	(10) Other (please specify):

Q22. Please comment freely on any educational problems you are facing, distinctive educational initiatives, and/or prospects for the future of education in your department.

Problems, etc. in education of students in your department	
Distinctive educational initiatives in your department	
Prospects for the future of education in your department	

End of survey. Thank you for your cooperation.

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture
-- Curriculum Survey (Graduate Departments) --

Request for Cooperation

This questionnaire is to be completed by the graduate school Dean or equivalent organizational unit head.

As part of an Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Tokyo University of Agriculture and Technology is conducting a questionnaire survey in order to solicit views on the current state of agriculture curricula in universities and graduate schools. Individual responses will not be made public under any circumstances without consulting the respondent. The findings of this study are to be used as reference by MEXT when planning university education initiatives in the future. We ask for your kind cooperation based on understanding of the purpose of the study. We understand that you may find it difficult to respond to some questions in certain circumstances. Please feel free to leave the answer section blank in such cases.

Please note that tabulation of questionnaire responses is handled by a private survey research firm, Libertas Consulting Co., Ltd.

When you have completed the questionnaire, **please forward it to the person responsible for collecting questionnaire responses in your university.**

Points to note when completing the questionnaire

- If your Master's and Doctoral degree programs (including joint graduate schools) are operated by structurally separate entities such as different graduate schools, or if you have an Integrated Master's/Doctoral degree program, please provide separate answers for the Master's program and Doctoral or Integrated Master's/Doctoral program. In cases such as these, please use two separate questionnaire forms and complete them separately for Master's programs and the Doctoral and Integrated Doctoral programs.
- Please respond in relation to the 2015 academic year unless specifically requested otherwise. If you are planning major changes from the 2016 academic year, we would be grateful if you could complete another questionnaire relating to 2016 (this is not essential; responses for 2015 only are acceptable).
- Please complete one questionnaire per department. If programs offered within the same department differ considerably in academic content, we would be grateful if you could complete a separate questionnaire for each department. In such cases, the word "department" in the questionnaire should be read as "program," etc.

Survey commissioned by:

Higher Education Bureau, Ministry of Education, Culture, Sports, Science and Technology

Survey conducted by:

Tokyo University of Agriculture and Technology

Inquiries:

Survey Secretariat (Libertas Consulting Co., Ltd.)

Staff in charge: Hatta, Kikuchi, Sobajima

E-mail : nougaku@libertas.co.jp

Telephone: 0120-575-332

0 Respondent Profile

University	Enter your response here
Graduate School	Enter your response here
Department	Enter your response here
Job Title	Enter your response here
Name	Enter your response here
Telephone	Enter your response here
E-mail Address	Enter your response here

I. Basic Data on Your Department's Academic Staff

Q1. Please state the number of faculty members (academic staff members) in your department in the 2015 academic year. (Enter your responses as numerals)

Number of full-time faculty members	
Professors	
Associate Professors	
Lecturers	
Assistant Professors	
Full-time faculty members with work experience outside the university sector	
Number of part-time faculty members	
Part-time faculty members whose main job is outside the university sector	

*Please enter figures as of May 1, 2015, as reported in the School Basic Survey.

II. Employment of Graduates of Your Department

Q2. Please enter the following information concerning graduates of your department in the 2014 academic year. (Enter your responses as numerals)

Master's programs			Doctoral programs		
Total number of graduates			Total number of graduates		
Graduates securing employment			Graduates securing employment		
Graduates proceeding to further study			Graduates proceeding to further study		

*Please enter figures as of May 1, 2015, as reported in the School Basic Survey.

Q3. Approximately what proportion of the graduates of your department secure employment within the prefecture in which your graduate school is located? (Enter your response as a numeral)

Graduates securing employment within the prefecture (Master's)	<input type="text"/>	percent approx.
Graduates securing employment within the prefecture (Doctoral)	<input type="text"/>	percent approx.

Q4. Do you expect an increase in the proportion of graduates of your department securing employment within the prefecture in which your graduate school is located? Answer this question based on your opinion as department head. (Pull-down menu selection)

Q5. Do you hope that graduates of your department secure employment within the prefecture in which your graduate school is located? Answer this question based on your opinion as department head. (Pull-down menu selection)

Q6. If your department implements any initiatives to promote graduate employment within the prefecture in which your graduate school is located, please outline them below. (Free format)

Q7. In regard to the career pathways of graduates of your department, please indicate if there has been an increase in any of the following fields or modes of work in recent years. Answer this question based on your opinion as department head. (Select O for any that apply)

<input type="checkbox"/>	Information technology
<input type="checkbox"/>	Trading company (Major)
<input type="checkbox"/>	Finance
<input type="checkbox"/>	Manufacturing other than agricultural machinery, food products, and textiles
<input type="checkbox"/>	Other (please specify):
<input type="checkbox"/>	Start farming (direct engagement in agriculture)
<input type="checkbox"/>	Work at an agricultural corporation
<input type="checkbox"/>	Work at an NPO
<input type="checkbox"/>	Work at an NGO
<input type="checkbox"/>	Entrepreneurship
<input type="checkbox"/>	Other (please specify):

Q8. For each of the items A through H below, please select the option that best describes your evaluation of the graduates of your department. Answer this question based on your opinion as department head. (Pull-down menu selection for each item A-H)

Options
(1) Excellent
(2) Very good
(3) Neutral
(4) Some further effort required
(5) Further effort required (problem area)

		Select option (pull-down menu)
A	Acquired specialized knowledge fundamental for work	
B	Acquired technical skills fundamental for work	
C	Acquired specialized knowledge directly applicable to work	
D	Gained a systematic, integrated grasp of the nature of the industry/area of employment	
E	Acquired proficiency in work methods (practical tasks, research methods, etc.)	
F	Acquired capacity to coordinate among different fields and areas	
G	Developed the positivity and serious attitude required in the workplace	
H	Developed habits of study and research	

III Course Content in Your Department

Q9. Please state your department's education and research goals, human resource development ideals (or educational objectives) and diploma policy. (Free format)

Education and research goals	
Human resource development ideals (or educational objectives)	
Diploma policy	

Q10. Does your department offer courses in any of the seven basic agricultural disciplines* shown below? Please select the symbol © for those which are a core curricular focus, and ○ for those which you offer but not as a core focus.

*Based on the *Points of Reference in Curriculum Design/Development for Disciplinary Quality Assurance in University Education*, Science Council of Japan (URL below)

<http://www.sci.go.jp/ja/info/kohyo/pdf/kohyo-23-h151009.pdf>

Response	Discipline	Outline	Example of courses offered
	1. Agricultural Chemistry	Studies directed to explication of the bio-mechanisms of animals, plants and microorganisms from individual to molecular levels, and discovery and development of applications for a diversity of chemical substances that govern biological activity.	Natural Organic Chemistry, Molecular Biology, Zymology, Microbiology, Botany, Zoology, Food Science, Information Science, etc.
	2. Production Agriculture	The disciplinary foundations of agriculture, addressing the production and use of crops, horticultural plants, etc. (including sericulture) related to food and energy resources and human lifestyles.	Crop Science, Horticulture, Agronomics, Breeding, Soil Science and Plant Nutrition, Plant Pathology, Applied Zoology and Entomology, Weed Science, Agroecology, Landscape Architecture, Landscape and Ecology Planning, Sericultural and Entomological Science, etc.
	3. Zootechnical Science	Basic biosciences and applied zoological sciences related to industrial animals (livestock, poultry, insects), companion animals, wildlife, laboratory animals, etc.	Overview of Zootechnical Science, Animal Husbandry, Animal Breeding, Animal Breeding Management, Animal Nutrition, Animal Physiology, Animal Anatomy, Animal Microbiology, Animal Immunology, Animal Hygienics, Theriogenology, Wildlife Zoology, etc.
	Veterinary Science	The study of diseases and injuries in animals other than humans, and their medical treatment, physiology, hygiene, etc.	Veterinary Ethics and Laws, Anatomy, Histology, Physiology, Veterinary Breeding and Genetics, Laboratory Animals, Pharmacology, Animal Pathology, Hygiene, Epidemiology, Toxicology, etc.
	4. Fisheries Science	Studies directed to the explication of the mechanisms and dynamics of biofunctions and bioproduction in the wide variety of organisms that inhabit oceans, lakes and rivers, together with their sustainable development, use and management for food production and other renewable resource purposes and the conservation of aquatic environments as a foundation therefor.	Marine Environment, Physiology and Ecology of Organisms, Fisheries and Aquaculture, Use and Processing, Economics and Management of Fisheries, Logistics, Fishing Communities, Fisheries Policy, etc.
	5. Forestry Science / Forestry Product Science	Studies of forests and forest resources such as timber and fungi, directed to the explication of diversity and maintenance mechanisms of forest ecologies; the conservation and use of the multiple functions of forests including land preservation, carbon dioxide absorption, and human health and leisure; the revitalization of forestry and forestry products as industries using forests and forestry products sustainably; and research and development in timber science and technology.	Silviculture, Forestry Policy, Erosion Control Engineering, Forest Ecology, Forest Engineering, Forest Product Manufacturing, Forest Product Science, Other (please specify):

	6. Agricultural Economics	Studies of problems concerning agriculture, food, rural communities, resources, and environments globally and within Japan, directed to analysis using methods from economics and other humanities and social sciences, identification of actual social conditions, and formulation of methods and means to address the problems.	Agricultural Economics, Agriculture Policy, Agricultural Management, Agricultural History, Cooperative Associations, Rural Sociology, etc.
	7. Agricultural Engineering	The use of engineering approaches and methods to address problems in agriculture. Involves studying the reciprocal systems of biological, environmental and human activity in order to achieve advancements in production infrastructure while building sustainable societies in harmony with nature.	Agricultural and Rural Engineering, Rural Planning, Agricultural Mechanics, Post-Harvest Engineering, Agricultural Meteorology, Bioenvironmental Engineering, Agricultural Structures, Agricultural Informatics, Ecological Engineering
	Other (please name below)	(Please provide an outline)	(Please list course examples)

Q11. For each year level in your department, please indicate the approximate proportion of the curriculum devoted to (1) lectures, (2) practicum, and (3) laboratory/fieldwork. (Indicate each as a proportion of 10)

	(1) Lectures	(2) Practicum	(3) Laboratory / Fieldwork	Total	
a. Master's first year				10	0
b. Master's second year				10	0
c. Doctoral first year				10	0
d. Doctoral second year				10	0
d. Doctoral third year				10	0

Q12. Does your department offer any of the following types of fieldwork/practicum classes? Please select ○ for those that you offer.

<input type="checkbox"/>	Scientific labora- tory methods	Bioscience experiments
<input type="checkbox"/>		Chemistry experiments
<input type="checkbox"/>		Physics experiments
<input type="checkbox"/>		Clinical animal (veterinary) experiments
<input type="checkbox"/>		Other (please specify):
<input type="checkbox"/>	Scientific field methods	Farm fieldwork
<input type="checkbox"/>		Forestry fieldwork
<input type="checkbox"/>		Marine fieldwork
<input type="checkbox"/>		fieldwork in farming, forestry or fisheries village, company, or local community
<input type="checkbox"/>		Other (please specify):
<input type="checkbox"/>	Informa- tion science methods	Bioscientific simulations, etc.
<input type="checkbox"/>		Simulations of farms, forests, water environments, global environment, etc.
<input type="checkbox"/>		Other (please specify):

Q13. Does your department have a fieldwork site? (Select ○ for any that apply)

<input type="checkbox"/>	(1) Yes, on the university campus
<input type="checkbox"/>	(2) Yes, off-campus (within the same prefecture)
<input type="checkbox"/>	(3) Yes, off-campus (outside the prefecture)
<input type="checkbox"/>	(4) No

Q14. Does your department offer any classes in partnership with companies? (Select ○ for the appropriate response)
If you chose "(2) Yes", please select the discipline in which the classes are offered, and briefly describe their content.
(For up to 5 of the major ones)

<input type="checkbox"/>	(1) No	
<input type="checkbox"/>	(2) Yes	
<div><div></div><div></div></div>		

Q15. Does your department implement any of the following initiatives in order to understand the educational needs of industry? (Select ○ for any that apply)

<input type="checkbox"/>	(1) We develop curricula and teaching materials to reflect input from stakeholders such as companies, NGOs, and local government	
<input type="checkbox"/>	(2) We work in partnership with industry to set achievement standards pertaining to the knowledge and skills to be acquired at university	
<input type="checkbox"/>	(3) We furnish opportunities for university-industry dialogue in order to raise our graduates' awareness of career paths	
<input type="checkbox"/>	(4) We enable students to participate in joint research with companies, etc.	Approx. no. of students participating in AY 2015: <input type="text"/>

Q16. In regard to your department's curriculum, please indicate which of the following you are (1) currently enhancing, and (2) plan to enhance from now on. (Select ○ as appropriate)

		(1) Currently enhancing	(2) Plan to enhance
C u r r i c u l a r	a. Lecture courses (general)		
	b. Lecture courses (specialized)		
	c. Fieldwork courses		
	d. Laboratory courses		
	e. Practicum courses		
	f. Seminars in research labs, etc.		
	g. Graduation research / thesis writing		
	h. Internships (for credit)		
O t h e r	i. Internships (not for credit)		
	j. Study abroad		

Q17. Please select the option below that best describes your department's students' degree of understanding of class content. (Pull-down menu selection)

Options

- (1) Almost all of our students understand class content
- (2) Around three quarters of our students understand class content well
- (3) Around half of our students understand class content well
- (4) Around one quarter of our students understand class content well
- (5) Almost none of our students understand class content

Selection	
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IV. Faculty Members' Research and Educational Activities

Q18. For each of the items below, please select the option that best describes your department's outlook and actual conditions regarding the research and educational activities of faculty members. Answer this question based on your opinion as department head. (Pull-down menu selection for each item A-D)

Options
(1) Agree
(2) Somewhat agree
(3) Neither agree or disagree
(4) Somewhat disagree
(5) Disagree

		Selection (pull-down menu)
A	Many faculty members tend to spend more time on research than education	
B	I would like faculty to spend more time on research than education	
C	When evaluating the performance of faculty members, we tend to place greater emphasis on research than education	

V Target Competencies

Q19. What competencies do you especially aim to cultivate through education in your department? Please select the symbol ◎ for the most prioritized competency, and ○ for any others that are applicable. Answer this question based on your opinion as department head.

Master's	Doctoral	
		(1) Ability to conduct innovative research and development with highly specialized expertise acquired at university
		(2) Ability to perform technical roles mobilizing expertise acquired at university
		(3) Ability to perform technical roles across a broad range of fields, making use of approaches and learning techniques acquired at university, even if not necessarily making direct use of expertise acquired at university
		(4) We are aware that graduates may end up working in areas unrelated to their specialization at university (and that awareness is reflected in the curriculum)
		(5) We are aware that graduates may end up working in areas unrelated to their specialization at university (but that awareness may not be clearly reflected in the curriculum)
		(6) Rather than emphasizing specialization, we aim to provide graduates with broad-based knowledge and skills and cultivate versatility, on the premise that they will engage in a wide variety of work in the future

Q20. In which of the following industries do you expect students in your department to find employment and work in the future? Answer this question based on your own opinion as department head. (Select ○ for any that apply)

	Conventional fields of employment for agriculture graduates	Agriculture-related company
		Food-related company (manufacturing, wholesale/retail, dining)
		Other chemistry-related company
		Public service (national government, local government, etc.)
		Teaching
		Veterinary
		Other (please specify):
	Industries other than agriculture, etc.	Information technology
		Trading company (Major)
		Finance
		Manufacturing other than agricultural machinery, food products, and textiles
		Other (please specify):
	New modes of work	Start farming (direct engagement in agriculture)
		Work at an agricultural corporation
		Work at an NPO
		Work at an NGO
		Entrepreneurship
		Other (please specify):

VI Education for Undergraduate and Graduate Students in Agriculture-Related Fields

Q21. Please indicate which of the following problems your department faces in the education of students. Answer this question based on your own opinion as department head. (Select ○ for any that apply)

<input type="checkbox"/>	(1) We cannot secure sufficient allocations (time) for classroom teaching
<input type="checkbox"/>	(2) We cannot secure sufficient allocations (time) for fieldwork, practicum etc.
<input type="checkbox"/>	(3) Faculty members are busy and cannot secure sufficient time for class preparation, etc.
<input type="checkbox"/>	(4) Faculty members are busy and cannot secure sufficient time for lab-based student guidance
<input type="checkbox"/>	(5) We want to enhance our fieldwork programs, but do not have a field site
<input type="checkbox"/>	(6) Students' motivation for learning and research is low
<input type="checkbox"/>	(7) It is difficult to conduct classes due to variation in student ability levels
<input type="checkbox"/>	(8) We do not know how to improve teaching and research guidance
<input type="checkbox"/>	(9) Faculty as a whole have low motivation to participate in faculty development activities, etc.
<input type="checkbox"/>	(10) Other (please specify):

Q22. Please comment freely on any educational problems you are facing, distinctive educational initiatives, and/or prospects for the future of education your department.

Problems, etc. in education of students in your department	
Distinctive educational initiatives in your department	
Prospects for the future of education in your department	

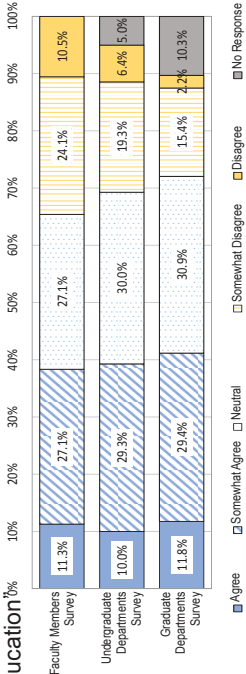
End of survey. Thank you for your cooperation.

Investigative Study on the Development of Human Resources in Science and Technology in the Field of Agriculture

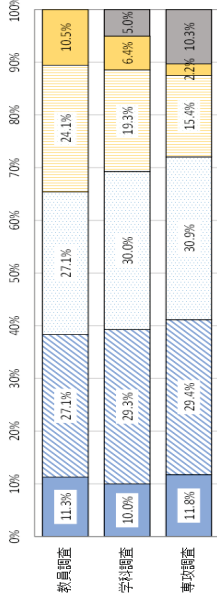
農学分野における理工系人材育成の 在り方に関する調査研究

① Time allocations to education and research

Current Conditions: "Tend to spend more time on research than education"



現状「どちらかというと教育活動より、研究活動に時間を割いている」



①教育と研究の 時間配分につい て

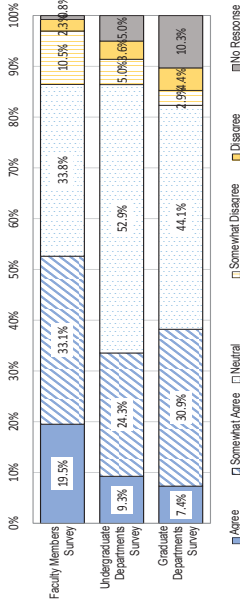
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- A. Survey on education-research balance
- B. Survey on connecting industry needs to curricular content
- C. Proposals on methods for verification and evaluation of educational systems
- D. Report on approaches to development of science and technology human resources in the field of agriculture

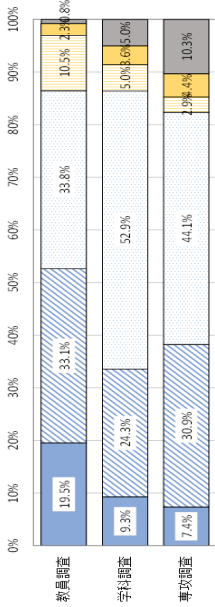
業務の内容

- A. 研究と教育のバランスに関する実態調査
- B. 産業界のニーズとカリキュラムのマッチング調査
- C. 教育システムの検証手法および評価手法に関する提案
- D. 農学系人材育成方策につなげる報告書取りまとめ

"Would like to spend more time on research than education"

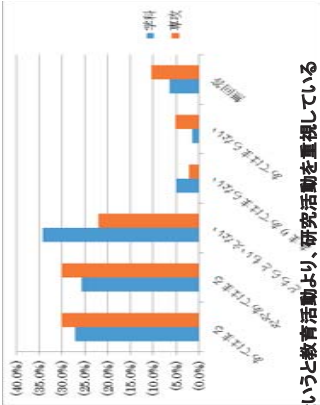
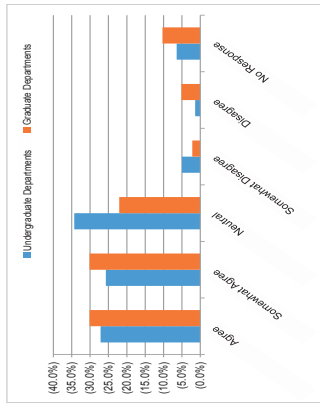


希望「どちらかというと教育活動より、研究活動に時間を割きたい
(割いて欲しい)」



■あてはまる □あてはまらない □あてはまらない □あてはまらない □あてはまらない □無回答

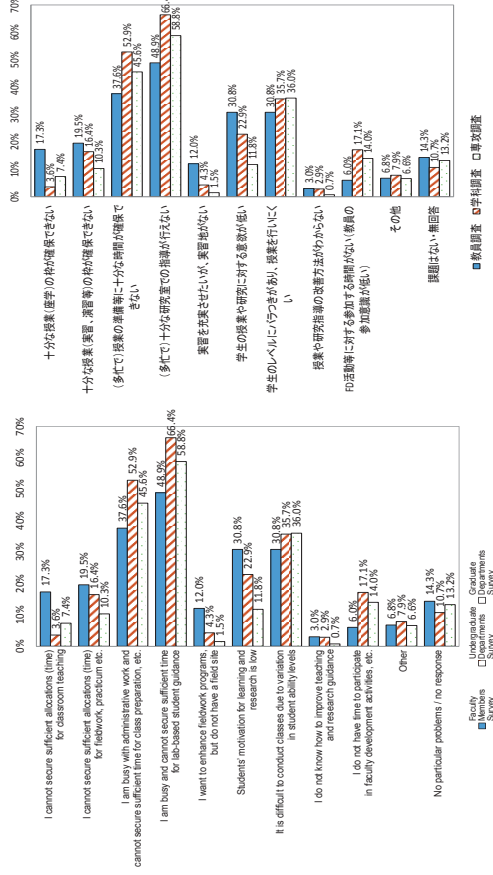
When reviewing the performance of faculty members, we tend to place greater emphasis on research than education



教員の人事評価の際には、どちらかというと教育活動より、研究活動を重視している

Problems in Education (multiple responses permitted)

教育上の課題 (複数回答)



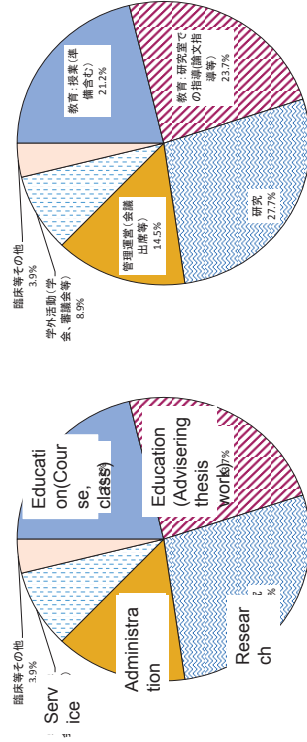
■教員調査 □学部調査 □専攻調査

Outline of the Project

- A. Survey on education-research balance
- B. Survey on connecting industry needs to curricular content
- C. Proposals on methods for verification and evaluation of educational systems
- D. Report on approaches to development of science and technology human resources in the field of agriculture

業務の内容

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- D. 農学系人材育成方策につながる報告書取りまとめ



1年間に仕事をする時間を100%とした時の各領域の割合 (n=131)

Percentages of works for faculty (n=131)

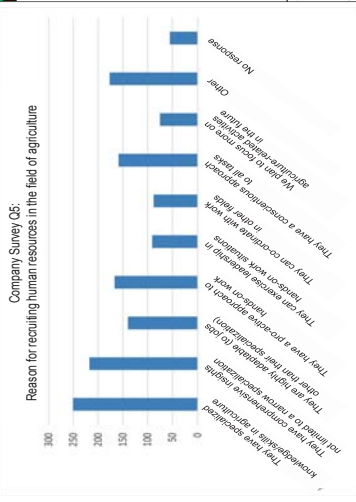
BA2 Target competencies and competencies in Education

(1) Competencies demanded of agriculture graduates

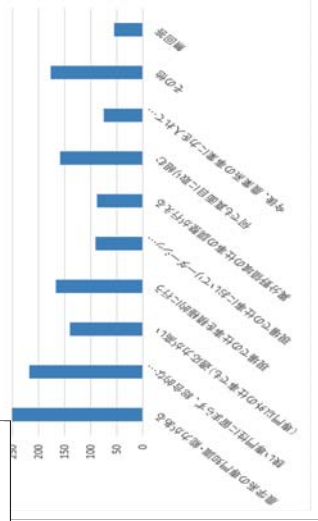
Qualities/ competencies of a specialist	Can acquire specialized knowledge fundamental for work Can acquire technical skills fundamental for work
Qualities/ competencies of an employee	Can acquire specialized knowledge directly applicable to work (practical tasks, research methods, etc.) Can develop the positivity and sincerity required in the workplace
Qualities/ competencies of a leader	Can acquire capacity to coordinate among different fields and areas Can gain systematic, integrated grasp of the nature of the industry/area of employment
Qualities/ competencies of an informed citizen	Can develop habits of study and research

専門家としての 資質・能力	仕事の基本となる専門知識を得ることができる 仕事の基本となる技術を得ることができる
被雇用者としての 資質・能力	仕事に直接役立つ専門知識を得ることができる 仕事のやり方（現場作業や研究作法等）などを学ぶのに役立つ
指導者としての 資質・能力	現場での積極性や、誠実さを身につけられる 異分野領域間の調整能力が身につけられる
知的市民としての 資質・能力	業界・分野の全体像を体系的・総合的に把握することに役立つ 勉強や研究する習慣を身につけられる

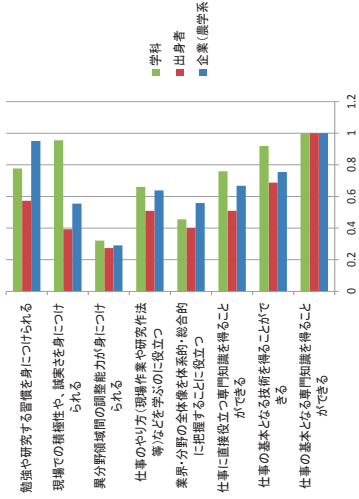
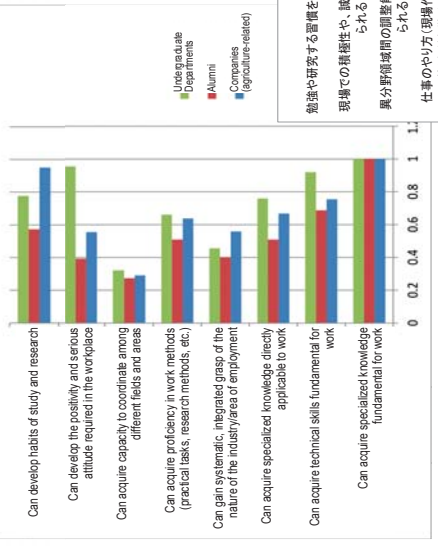
(2) 教育が目指す資質と能力 ①農学系出身者に求める能力



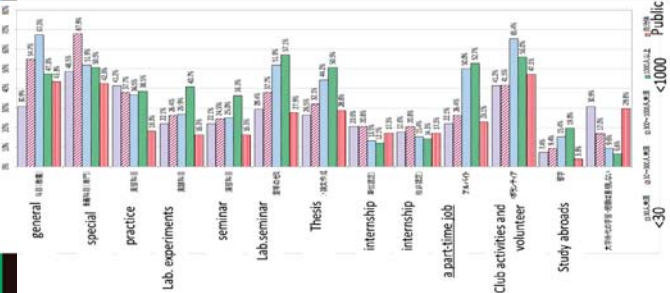
企業間5.農学系の人材を採用したい理由

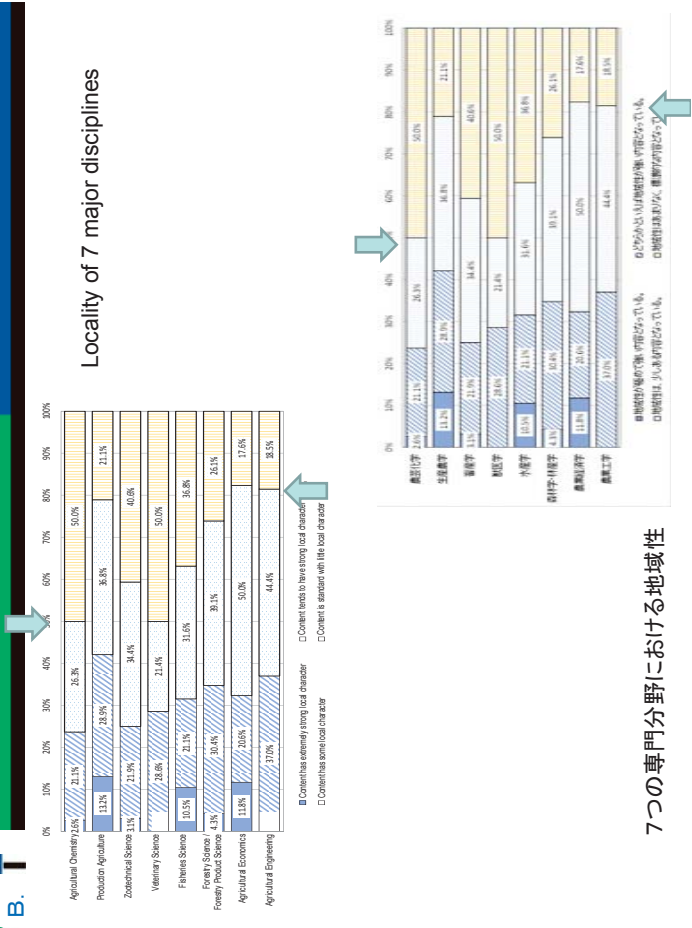
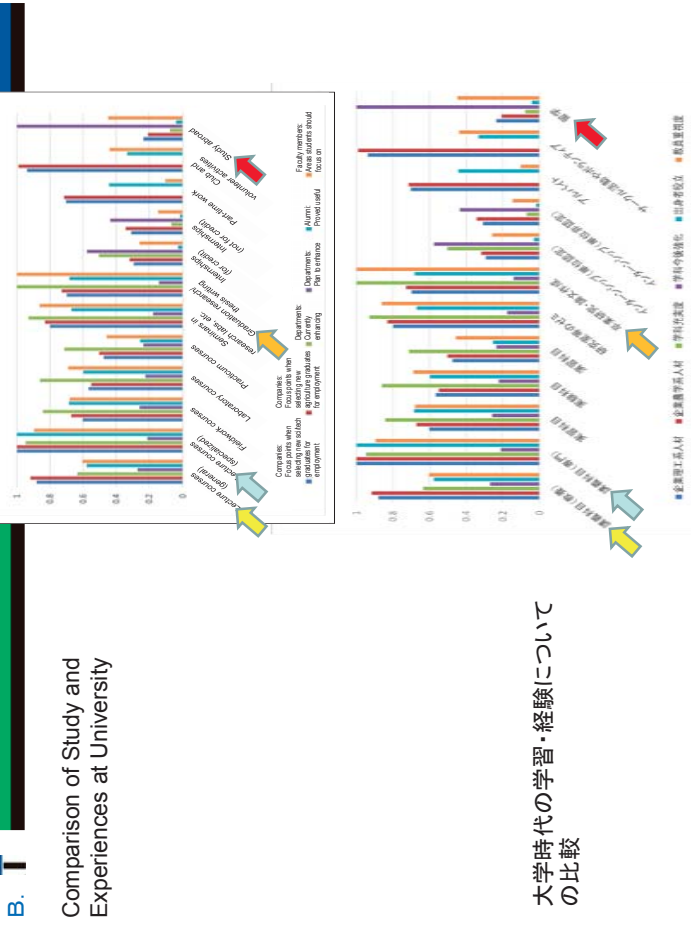
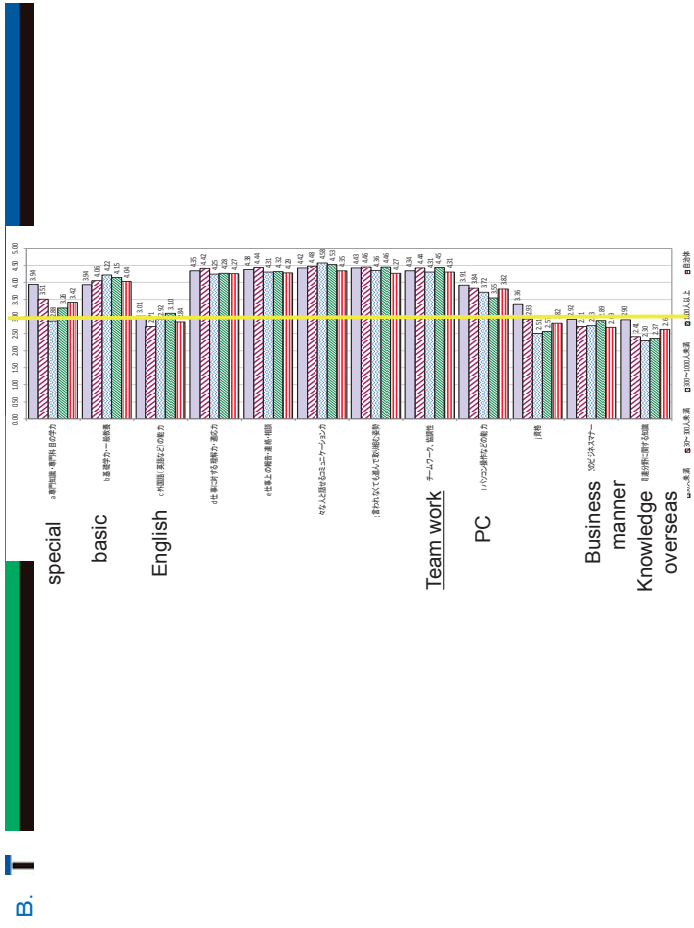


B. Target competencies and competencies in Education

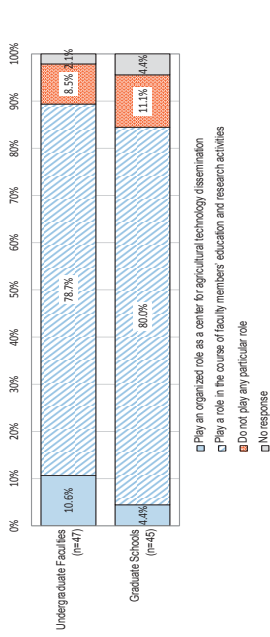


B. Target competencies and competencies in Education

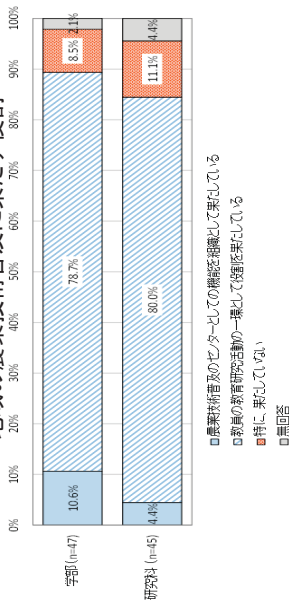




Universities' role in agricultural extension in local area

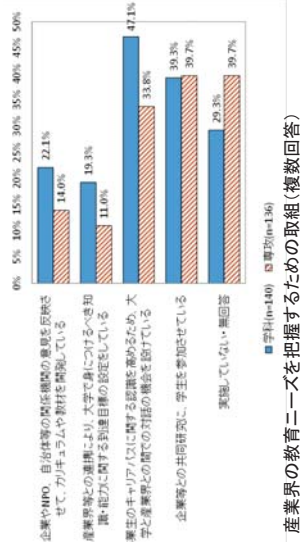
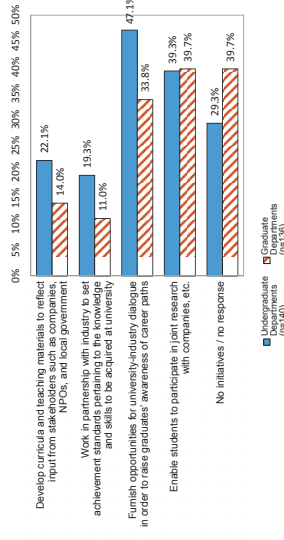


地域の農業技術普及に果たす役割



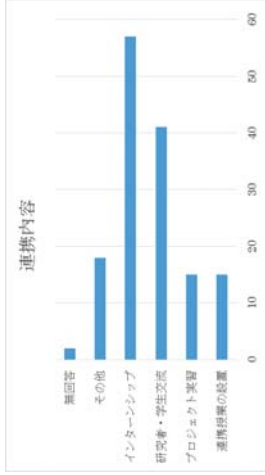
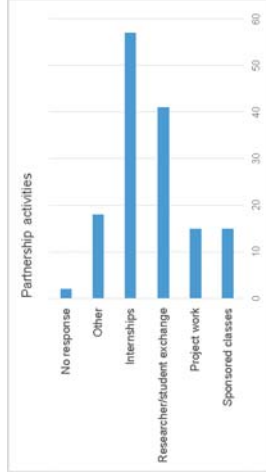
農業技術普及のセンターとしての機能組織として果たしている
 農業技術普及の活動の一環として取り組んでいる
 特に果てない
 無回答

Initiatives to understand the educational needs of industry (multiple responses permitted)

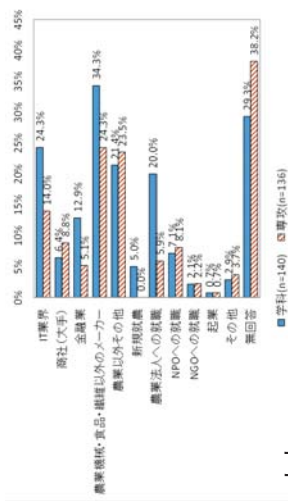
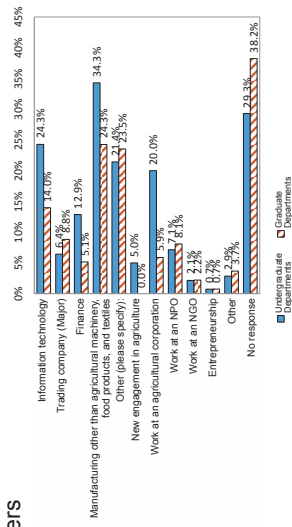


産業界の教育ニーズを把握するための取組 (複数回答)

Educational partnerships

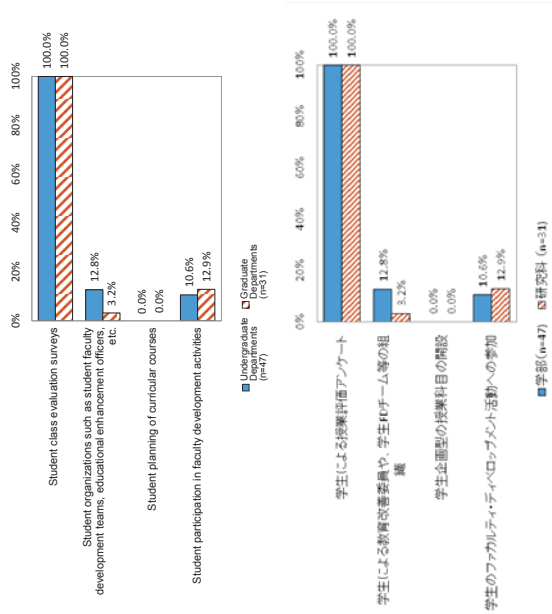


New partners



新たな連携のパートナー

C. T Evaluation of classes by students (multiple responses permitted)



学生による授業評価（複数回答）

Higher Education in Agriculture in California

Shrini K. Upadhyaya
Professor, Graduate Adviser, and Graduate
Program Chair
Biological and Agricultural Eng.
UC Davis

LGP Workshop on Higher Education
TUAT, March 15, 2016

Higher Education in US

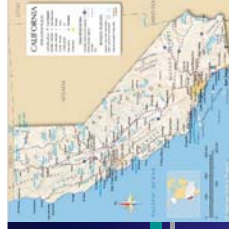
Morrill Land Grant Act of 1862:

- Prior to 1862 higher education in US was mainly liberal arts education reserved for the elite few offered mainly by private institutions.
- ➔ However, Morrill act sought to make higher education accessible to the masses

Morrill Act – Signed by President Lincoln

- ❖ Provided Land-grant subsidy for expansion of higher education
- ❖ Required the inclusion of agriculture and mechanical arts
- ❖ Also, required research and public service be included in addition to teaching
- ➔ However, the responsibility for higher education was put in the hands of State Governments!!!

Higher Education in California



- ❖ California, being a part of newly settled West, did not have an elaborate system of private institutions that were common in the East.
- ❖ So the State seized the opportunity provided by the Morrill act and set out to establish institutions of higher education to ensure socio-economic mobility and provide an engine for economic growth
- ➔ California emulated a great experiment in higher education and led the nation in mass higher education that fundamentally helped reshape the society.

California Idea



- In 1868 UC Berkeley was the first institute of higher education that was set up through the merger of private College of California and public College of Agricultural, Mining, and Mechanical Arts.
- Public Universities tended to favor *experimental and scientific studies* unlike the private institutions that favored classical liberal art studies.
- In 1887 Hatch Act was passed that provided dependable federal funding for agricultural research (Agricultural Experiment Station).
- Agriculture College was the first one that was set up at UC Berkeley.

What is appropriate Agricultural Education?

- Grange – Patrons of Animal Husbandry founded in 1867 favored hands-on, practical farm skills.
- Learning various agricultural tasks on a model farm was considered to be superior than class room and book learning.
- Wanted Agricultural Colleges to be separate from Universities.
- ➔ California, like New York, did not accept this idea. It incorporated College of Agriculture as an academic division to the land-grant University resulting in friction with Grange.

Agriculture as a scientific discipline

"Not more drills in the handicraft but more use of brains trained in the science related to agriculture....."

"Farmers' status should be elevated to the true dignity of learned profession, second to none in complexity and difficulty of problems it deals with and superior to many in its fundamental importance"

- ➔ Before a national audience he criticized Grange's call for student labor on college farm as narrow in scope and not helpful in producing future progressive farmers.
- ➔ Under his leadership College of Agriculture developed reputation for agricultural research and Hilgard was recognized internationally for this accomplishment

Eugene W. Hilgard

Need for practical training

- ❖ However, farmers were not ready send their children to Berkeley for just "theoretical knowledge"
- ❖ Realizing this Hilgard made sure that there were at least some practical training.
- ➔ Short courses in "principles and practices of dairying" was offered. Other short courses were also developed that included field trips to farms, wineries and canneries. Summer internships on farms were also included.

Farmers Institute

- ❖ In 1890s new kinds of machinery, irrigation technologies etc. resulted in healthy farm economy and increased interest in agricultural education
- ❖ California State Grange requested College of Agriculture at Berkeley to offer day-long short courses called "Farmers Institutes" to rural communities.
- ❖ These became so popular that in 1897 University Extension was established.
- ❖ In 1904 thousands of people (43,680) attended 113 such 1-day institutes held at Berkeley (- this far exceeded UC Berkeley resident enrollment)!

Need for University Farm

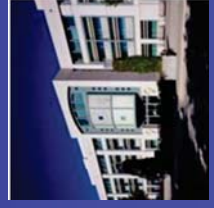
- ❖ Agricultural class rooms were overcrowded at Berkeley
 - ❖ Facilities were getting inadequate
 - ❖ To make matters worse a fire destroyed 2-story Ag building in 1897
- Hilgard realized the need for a University Farm. However, Berkeley was not suitable due to foggy and cold climate in Summer

Berkeley to Davis

- ❖ There was a critical need for an University Farm to provide practical training in agriculture
- ❖ State's growing dairy industry started lobbying for a better school to encourage better farming in California.
- ❖ Peter J. Shields, a judge by profession, set out to introduce a bill to start a dairy school and experimental farm in Yolo County.

Peter J. Shields - University Farm

- ❖ Judge Shields was successful in getting University Farm Bill passed in 1905 with the support of various agricultural groups.
- ❖ After a considerable discussions and Yolo County was chosen and the University Farm was born in Davisville on September 1, 1908



University Farm

- ❖ Short courses were offered in dairy, irrigation, poultry husbandry, animal husbandry, veterinary science, soil science etc.
- ❖ On campus residential instruction started in 1909 – Agricultural High School with practical subjects such as farm machinery, soil fertility etc. were started
- ❖ International students from many countries started attending as early as in 1913.

Division of Farm Machinery -1915!

- ❖ In 1912 Farm economy prospered that saw growth in University Farm.
- ➔ A division of Farm Machinery was established in Davis in 1915!!!



First World War and Declining Farm population

- ❖ After WW I farm population dropped and mechanization increased.
- ➔ University Farm became the *Northern Branch of College of Agriculture (Berkeley campus)* in 1921.
- ➔ During 1920s and 30s, Davis developed as a research institution and gained national prominence. Ag Extension expanded.
- ➔ Started offering *joint degrees with UC Berkeley* in Animal Science, Plant Science and Agricultural Engineering

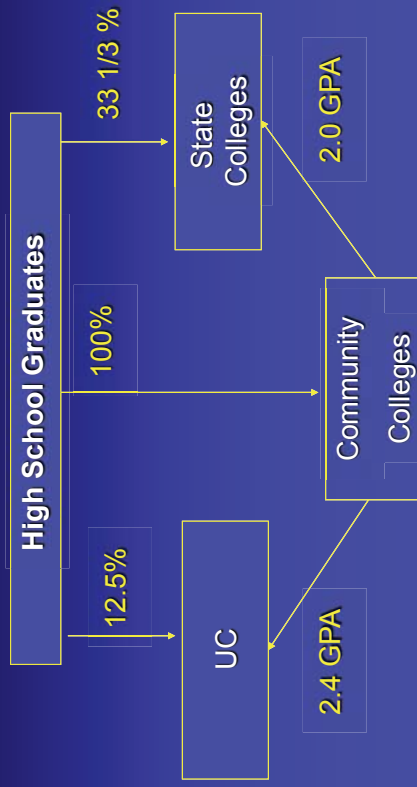
Second World War

- ❖ Following WW II high priority was given to Agriculture by Federal and State government.
- ❖ National Science foundation was formed in 1950 that infused large sum of research money [GI Bill, launching of Sputnik also were responsible]
- ❖ UC was decentralized in 1948. First College of Ag Commencement happened on Davis campus that year.
- ❖ UC Davis developed very rapidly after WW II and became a general campus in 1959.

Clark Kerr – Master Plan Higher Education in California

“[I]t was the first time in the history of any state in the United States, or any nation in the world, where such a commitment was made — that a state or a nation would promise there would be a place ready for every high school graduate or person otherwise qualified. It was an enormous commitment, and the basis for the Master Plan.”

Promise of Affordable Education



UC Davis and Master Plan

Golden ERA:

College of Engineering, College of Letters and Science, School of Medicine, School of Law, School of Veterinary Medicine were added
[School of Business, Public Health and Nursing were also added]



Graduate Groups

- As early as 1950s concept of Graduate Group was developed which became a great strength of UC Davis.
- Graduate Group: Scholars with similar background and interest from across the campus join to create these graduate programs.
- ➔ This concept was adopted by other Universities later

1965 – Re-appropriation of California Legislature

- ❖ In 1965 re-appropriation of representation in California Legislature shifted the power from *farming communities* to *urban area* [Population rather than geography based]

- ➔ Support for Agricultural Experiment Station started going down. Federal cut backs added to woes.
- ➔ Public interest and concern about the environment started to grow.

College of Agriculture and Environmental Sciences

- ❖ Increased concern about pesticide use, harvest mechanization, displacement of labor and farm workers working/living conditions, establishment of environmental agencies at the State and Federal level necessitated a shift in the mission to address environmental issues
- ➔ College of Agricultural Sciences was renamed College of Agricultural and Environmental Sciences in 1967

Declining Support for Higher Education

- ❖ Interest in Small farms, sustainable production, organic production, locally grown fresh products started to increase.
- ❖ Davis became nationally and internationally recognized in the field of Agriculture.
- ❖ However, since 1970s support for higher education has been decreasing [since Vietnam war era]. 1990s saw severe cutbacks. *State support decreased to less than 30%.*

Key Issues

- ❖ Increasing cost of Education
- ❖ Decreasing State and Federal Support
- ❖ High student debt (1.2 trillion dollars)
- ❖ Need to raise funds – donations!
- ❖ CEO style salaries to administrators
- ❖ Revenue generating /self supporting programs (MS IL, professional schools – law, business etc.)

Changes in Higher Education

BS/MS Integrated

BS

MS

PhD

Direct PhD (MS on the way)

Revenue generating MS II – Coursework based – No thesis

Higher Education in Agriculture

➤ Increasing interest in Harvest Mechanization (Robotics), Automation (-particularly weed control), Big data, Analytics, Precision Agriculture, Phenomics.

➔ USDA (2015 – 2020): Need **57,900** Agriculture graduates annually. Annual graduation rate is **35,400**. Expecting huge shortage of Food Scientists, Plant Scientists, Water Resource Scientists, Precision Agriculture Specialists, Farm Animal Veterinarians.


Key References




- (i) Scheuring, A.F. 2001. Abundant Harvest – The History of University of California, Davis. 364 pp.
- (ii) Blumenstyk, G. 2015. American Higher Education in Crisis? Oxford University Press. 198pp.
- (iii) www.purdue.edu/usda/employment




THANK YOU!

<div> <div>TUM</div> <div>Technische Universität München</div> </div>	<div> <div>Condition and challenges in agriculture education in Germany</div> <div>The case of the Technical University of Munich</div> <div>16. March 2016</div> <div>Prof. Dr. Heinz Bernhardt Agricultural Systems Engineering – TU München</div> </div>	<div> <div>TUM</div> <div>Technische Universität München</div> </div>	<div> <div>TUM. Milestones</div> <div> <div>1868: King Ludwig II founds the "Polytechnic School,"</div> <div>1877: "Technical University"</div> <div>1901: Right to Award Doctorates First Doctoral Candidate: Georg Hauser (Chemist)</div> <div>1905: Admittance of female students First Female Doctoral Candidate: Amalie Baur (Chemist)</div> <div>1930: Integration of the College of Agriculture and Brewing in Weihenstephan</div> <div>1957: First Neutron Research Reactor in Germany</div> <div>1967: Department of Medicine, University Hospital</div> <div>1970: Presidential Constitution, "Technische Universität München"</div> <div>1999: TUM's University Reform started Entrepreneurial University Constitution</div> <div>2000: Center of Life and Food Science Weihenstephan (Matrix Structure)</div> </div> </div>	<div> <div>16th March 2016</div> <div>Prof. Dr. Heinz Bernhardt</div> <div>3</div> </div>
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<div> <div>TUM</div> <div>TUM. The entrepreneurial University.</div>  </div>	<div> <div>TUM</div> <div>Technische Universität München</div> </div>
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<div> <div>TUM. WZW. Locations in Bavaria.</div> <div>  <div>Munich</div>  <div> <div>• TUM-WZW Locations</div> <div>Iffeldorf</div> <div>Garching</div> <div>Straubing</div> </div>  </div> </div>	<div> <div>16th March 2016</div> <div>Prof. Dr. Heinz Bernhardt</div> <div>4</div> </div>
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<p>Technische Universität München TUM</p>	
<p>TUM Faculties</p> <p>Center of Life and Food Sciences Weihenstephan</p> <div> <div> <p>Mechanical Engineering</p> <p>Mathematics</p> <p>Physics</p> <p>Informatics</p> <p>Electrical Engineering and Information Technology</p> </div> <div> <p>Sports and Health Sciences</p> <p>TUM School of Education</p> <p>Medicine</p> <p>Chemistry</p> <p>Architecture</p> </div> </div> <p>TUM School of Management Civil, Geo and Environmental Engineering</p>	<p>16th March 2016</p> <p>Prof. Dr. Heinz Bernhardt</p> <p>5</p> <p>Technische Universität München TUM</p>
<p>Studies at the University</p> <p>base knowledge</p>  <p>specialized knowledge praxis knowledge</p>	<p>16th March 2016</p> <p>Prof. Dr. Heinz Bernhardt</p> <p>7</p>

<p>Technische Universität München TUM</p>	
<p>Research and education structure in Germany</p> <p>University of applied Science</p> <p>University</p> <p>Research center</p>	<p>16th March 2016</p> <p>Prof. Dr. Heinz Bernhardt</p> <p>6</p> <p>Technische Universität München TUM</p>
<p>Bachelor, partial Master</p> <p>Ph.D.</p> <p>in cooperation with university</p>	
<p>How to use a system</p> <p>How to construct a system</p> <p>How to investigate a special part of a system</p>	
<p>Problems</p> <p>University management</p> <ul style="list-style-type: none"> Research is the only evaluation criterion <p>Industry</p> <ul style="list-style-type: none"> Not enough practice too much theory takes too long <p>Government</p> <ul style="list-style-type: none"> too expensive not enough graduates <p>Students</p> <ul style="list-style-type: none"> The study should be easier 	<p>16th March 2016</p> <p>Prof. Dr. Heinz Bernhardt</p> <p>8</p>

Cooperation between universities and industry

- employers of graduates
- about 90% of the Ph.D. go in the industry and the government
- joint research projects
- internships for students
- guest lectures by industry
- ...

16th March 2016

Prof. Dr. Heinz Bernhardt

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Thanks for your attention.



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16th March 2016

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