IOWA STATE UNIVERSITY

DEPARTMENT OF AGRONOMY

STRATEGIC DIRECTIONS

2004-2009

PROLOGUE

The Department of Agronomy's *Strategic Directions* is a living document, crafted collaboratively by the members of the department to provide a charter for the organization's future. This tool will provide guidance and a basis for decision-making regarding appropriate direction and investment of our resources and effort. The process leading to formulation of the plan was rooted in *The Path to the Future*, the self-examination and statement of vision resulting from an anonymous endowment of the department in 1997 (Appendix A, p.13). *The Path to the Future* is a result of meetings and discussions that took place over the period of one year. As such, it reflects the issues, opportunities, constraints and priorities that department staff perceived and understood at a point in time.

Agronomy Department staff have understood our recent strategic planning exercises to be continuous with that endeavor. While we are committed to the objectives described herein, we understand that time and circumstances may change our organization's view of the issues we confront. We therefore conceive of the present document as a "navigational aid," one that will serve as a reference to stated intentions and their associated rationale, but we understand that we must continuously look forward and re-examine our goals. Strategic planning has become ingrained in our department over the past six years, as a necessary and iterative process, and we are committed to examining, discussing and redefining our direction at least once annually. Navigation is meaningful only in support of a clearly defined destination. The present document summarizes the department's present view of its destination and provides some useful mileposts to chart our progress to that destination. As results are achieved and the panorama before us changes, we are not only certain that our destination will change, but we are willing to engage in visualizing and shaping our future dynamically, by constantly assessing and redefining who we are and what we do in terms of present and foreseeable responsibilities and opportunities.

INTRODUCTION

Agronomy at Iowa State University is one of the oldest, largest and most productive agronomy departments in the United States. The presence of USDA laboratories, competitive undergraduate and graduate student programs, and collaborations with other University departments and centers provide a healthy environment for teaching, research and extension.

At the same time, changing conditions in agriculture and higher education, in consideration with the relative strengths and weaknesses of the Department, required us to involve faculty, staff and stakeholders in a long-range planning process to identify the strategic issues for which we had no easy answers. The process began in August 2002 with the construction of three very different future scenarios that would affect the Department.

Scenarios provide a story of the future that makes sense in the present and stimulates members of the Department to think through a host of alternatives. Scenarios offer a disciplined way of thinking, not predictions about the future. Small groups of department members constructed the scenarios, and used the process to compare the current relative strengths and weaknesses of the department with a range of opportunities and threats that could materialize. A retreat with faculty and staff on November 24-25, 2002, gave participants a chance to discuss the scenarios and potential impacts on the department. The retreat also highlighted unresolved strategic issues for the department. The summary notes from the scenario planning process are presented in Appendix B.

In January of 2003 a comprehensive review of the department was conducted by an external panel of scientists. Issues and ideas that had surfaced during the scenario planning process were presented to the panel for comment. The sections below compile ideas generated during the planning process and suggested by the review panel, and discuss various strategic issues and possible strategic directions for the Department.

STRENGTHS TO CELEBRATE, WEAKNESSES TO ADDRESS

1. Relative Strengths (compared to other similar academic departments):

Faculty and staff. The faculty is large and represents a diversity of disciplines within agronomy. In contrast to what has occurred at many other similar institutions, the Department has remained intact over the years, and this puts it in a position of relative strength in terms of addressing the range and complexity of issues facing agriculture today. The Department also employs a large cadre of highly skilled support staff to amplify the capacity of the faculty in its research, teaching, and extension missions. The Department is nationally prominent in all three of these mission areas.

Collaborators, and affiliations with centers and institutes. Programs within the Department are leveraged by the expertise of USDA scientist/collaborators on campus. Activities of the faculty are further enhanced by the presence on campus of relevant centers and interdisciplinary programs, such as the Leopold Center, the Seed Science Center, the Plant Sciences Institute, and the interdisciplinary graduate degree programs in sustainable agriculture, environmental sciences, genetics, and ecology and

evolutionary biology. The climate at Iowa State University is conducive to interdisciplinary collaborations.

Resources. The Department has excellent resources, including an endowment. This provides it with opportunities that are unparalleled compared to any other equivalent department of agronomy in the nation.

2. Relative Weaknesses (compared to other similar academic departments):

Integration of research and teaching. Because of the tradition of hiring faculty that specialize in either teaching or research, few research faculty have contact with undergraduate students. Consequently, undergraduates lack sufficient opportunities for exposure to many aspects of the science that is being conducted within the Department.

Integration of basic and applied research. The tradition of hiring specialized faculty has led to little communication between those conducting basic research and those whose research is considered applied. Consequently, the basic science mission of the Department tends not to inform the applied science/extension mission and vice versa.

Size of the Department and configuration of Agronomy Hall. While also considered to be a strength, the sheer size and breadth of the Department results in compartmentalization, poor intradepartmental communication, and a lack of a sense of community. This is exacerbated by the design of the building, which does not allow open doors due to fire code, and which has no central common gathering area.

STRATEGIC ISSUES

Four major issues emerged from the scenario planning process and an analysis of the various strengths, weaknesses, opportunities, and threats facing the department. These issues are complex and will require a redefinition or a refocusing of some aspects of our mission. We believe that it is critical to address these issues if the Department is to retain its excellence into the future. Wherever possible, we have identified success indicators that are definitive and measurable within a period of five years. We recognize, however, that some specific targets initially may be somewhat arbitrary and will require adjustments over time.

ISSUE 1: Student Learning

As the structure of agriculture changes, the student population of the department will change as well. Declines in the number of farms, farm families, and family size are likely to result in fewer students coming from, or going back to production agriculture pursuits. Undergraduate enrollment in the traditional Agronomy major has declined over the past several years (e.g., from 223 in 1999 to 135 in 2003). Ironically, demand for B.S. graduates of the department is high. Opportunities exist for new undergraduate specializations, coupled with both resident and distance approaches to education. Additionally, it must be recognized that demand for Agronomy undergraduate courses by students in other majors continues to grow. In 1996 a total of 2600 students were enrolled in undergraduate courses offered by the Department. By 2003, that number grew to over 3800, almost a 50% increase. Opportunities also exist to expand our distance education offerings. The Distance M.S. in Agronomy has established the department as a national leader in agricultural educational technology, and the platforms and infrastructure used in that program could be applied to a number of our undergraduate courses to allow course delivery at a distance.

Goal 1: Stabilize enrollment in the undergraduate Agronomy major

Strategy 1: Expand current recruitment strategies to target additional clientele. This could involve conversations with high school science teachers, linkages to community colleges, holding summer workshops for science teachers. Additionally, promote the new undergraduate specializations through participation in existing summer programs (e.g., recruit students into the Plant Breeding and Biotechnology option by participating in the programs offered by the Office of Biotechnology).

Strategy 2: Expand the public relations function of the departmental website specifically to target potential students and their parents

Strategy 3: Create new options within the Agronomy major that will be more attractive to non-traditional students. Examples of more science-focused options include “Plant Breeding and Biotechnology,” “Environmental Soil Science,” and “Agronomic Business

Management." Developing these options will require assessing the extent to which course requirements can be met by existing courses on campus, as well as by new courses to be developed by faculty within the Department. Recruitment of potential students both on and off campus will be critical.

Strategy 4: Create and promote a range of minors in Agronomy that are attractive to undergraduates who major in another areas (e.g. Genetics, Biology, Geology, Environmental Science, Business)

Strategy 5: Offer a combined BS/MS program and a BS with thesis option

Success Indicators

- Student enrollment stabilized at 2003 levels (130) by fall semester 2008
- Increase in the number of faculty with primary responsibility for an undergraduate course by 25%
- Twenty-five percent of the faculty participating in undergraduate courses as guest lecturers
- Fifty percent of the faculty offering undergraduate students a meaningful experience in research

Goal 2: Enhance distance education offerings

Strategy 1: Explore new opportunities for offering undergraduate courses via distance education

Strategy 2: Expand the departmental capacity in educational technologies

Strategy 3: Increase the number of faculty teaching at a distance through administrative support, technical assistance, and other incentives

Strategy 4: Explore the possibility of offering additional post-graduation educational opportunities to alumni and the private sector

Success Indicators

- Development of three new courses offered via a distance
- A 25% increase the number of faculty engaged in distance education
- Thirty students enrolled in the new distance education courses

ISSUE 2: Integration of Departmental Missions

Research/Teaching: The department strongly believes that its undergraduate programs are enhanced by having a cadre of faculty whose primary job responsibility (70-80%) is undergraduate instruction. And, while the department believes that this teaching group must be maintained, it also means that a relatively small number of faculty in Agronomy have responsibilities for undergraduate teaching. Opportunities therefore exist to enrich the undergraduate learning experience by giving students greater exposure to our research faculty, who represent some of the leading researchers in their disciplines. Maintaining

the department's strength in undergraduate teaching while bringing some research faculty into the undergraduate curriculum will be a challenge, but presents a tremendous opportunity for improving both the undergraduate and graduate programs. Our model is to maintain or enhance the existing teaching faculty "core" while enhancing existing courses via adding participation from research faculty as appropriate; and, where appropriate, expanding our curriculum with new course offerings by research faculty. Again, the participation of undergraduate instructors and research faculty must be carefully balanced in order to deliver all the emergent properties of a dynamic undergraduate experience.

Extension/Teaching: Approximately 50% of our B.S. graduates become practicing agronomists. Yet during their undergraduate experience, they are presented with few opportunities to interact with our extension faculty, or to learn about the extension system and the services it can provide them in their profession. Additionally, graduate students whose advisors do not have extension appointments rarely are exposed to extension programs or activities.

Extension/Research: Although most extension faculty members also carry a research appointment, there is limited communication between extension faculty and their research counterparts within the same discipline in the department. Most research faculty rarely participate in outreach or extension; and when they do so, activities usually are not coordinated with activities of extension faculty. The Land Grant mission of the department will be better served if there is better communication and coordination between the research and extension programs.

Basic and applied sciences have always coexisted within the department, but have not always been well integrated with each other, or with the extension program. Similarly, interdisciplinary collaborations, both with the department and across campus, have not been as pervasive as they could be. For example, opportunities exist for the greater interfacing of molecular genetics with plant physiology, both traditionally strong but distinct programs in the department. Additionally, there are opportunities for increased integration of soil science, environmental science, and sustainable agriculture, both within the department and across campus. Bridging the basic-applied research gap and developing multi-disciplinary teams should be a priority for the department.

Goal 1: Provide opportunities for greater interaction between the research faculty and undergraduate students.

Strategy 1: Encourage greater participation of research faculty within the existing Agronomy (general) major through greater use of guest lectures, laboratories and the integration of modules developed/taught by research faculty

Strategy 2: Encourage faculty to create research experiences for undergraduates

Strategy 3: Encourage research faculty to offer courses for new options in the Agronomy major (Issue 1, Goal 1, Strategy 1)

Strategy 4: Consider undergraduate teaching as an expectation of all new faculty hires

Success indicators:

- Establishment of three new options within the Agronomy major
- Thirty percent of Agronomy students enrolled in new options
- Three to five new courses offered by faculty having primary research appointments
- Fifty percent of the faculty involved directly with undergraduate teaching

Goal 2: Improve communication between research and extension faculty

Strategy 1: Encourage involvement of research faculty in extension activities, such as the Field Extension Education Lab (FEEL), Crop Advantage Series, etc.

Strategy 2: Solicit input from research faculty for extension publications, such as fact sheets, the ICM Newsletter, web pages, etc.

Strategy 3: Encourage joint research projects between research and extension faculty

Success indicators:

- Fifty percent of the research faculty participating in extension activities
- Ten percent of new research projects showing joint collaboration between research and extension faculty
- Ten percent of all departmental publications having joint extension/research faculty authorship

Goal 3: Create opportunities for both undergraduate and graduate students to become more aware of the functioning of cooperative extension and outreach as a mission of land grant universities

Strategy 1: Involve state and field extension specialists in field trips for undergraduate classes

Strategy 2: Provide opportunities for graduate students to participate in extension programs

Success indicators:

- Establishment of a requirement that all undergraduate students participate in at least one extension activity
- Fifty percent of the graduate student body attending extension activities/meetings annually
- Twenty-five percent of the graduate student body presenting talks at extension meetings annually

ISSUE 3: The changing structure of agriculture and the challenges faced by commodity producers

Agriculture in Iowa is changing; farm numbers are shrinking and farm size is expanding. Critical emerging issues including environmental concerns, economic sustainability, food safety, bioterrorism, population growth, and land use will affect not only Iowa, but also the Midwest, the nation, and the world. Because of its critical mass of expertise, its facilities, and its regional location, the department is well positioned to demonstrate leadership in meeting these challenges.

The department will maintain a strong research and education program based on the primary commodity crops of Iowa, corn and soybeans. However, our production agriculture research and extension programs must develop a greater environmental perspective to address these emerging global issues. We will continue to serve our traditional supporters and clients even as we begin to engage potential new stakeholders, including environmental groups and urban populations.

The department has the opportunity to bring biotechnology and sustainable-alternative-organic agriculture together with mainstream production agriculture in both extension and research programming. Additionally, as pointed out during the recent departmental review, there will be opportunities to couple our expertise in plant/crop physiology with emerging discoveries in basic plant molecular biology. Changes in plants arising from gene manipulation in the laboratory may not necessarily result in improved performance in the field, and could involve complex interactions with the environment. Investigating these interactions and expanding incorporation of molecular tools into the plant and crop physiology discipline will provide a new frontier for crop physiology.

The department will foster a systems-oriented and landscape scale approach to agricultural production that seeks to minimize environmental problems while maximizing producer profits This approach will require the application of precision farming, GIS-based research, and remote sensing, areas in which the department will need to improve its capacity.

Goal 1: Sustain faculty expertise and commitment to corn and soybean production agriculture in Iowa

Strategy 1: Maintain critical strength in corn and soybean breeding

Strategy 2: Maintain critical strength in applied soil management/conservation

Strategy 3: Enhance expertise in crop and plant physiology

Strategy 4: Maintain critical strength in extension, particularly corn and soybean extension

Success indicators:

- Maintenance of faculty and staff positions in plant breeding at current (2003) level of FTE
- Maintenance of faculty positions in applied soil management and conservation at current (2003) level of FTE
- Enhancement of faculty and staff positions in plant and crop physiology from the 2003 level of FTE's.
- Filling of the currently vacant extension corn specialist position

Goal 2: Increase faculty participation in projects/programs that emphasize cropping systems and alternative crop production schemes that are environmentally beneficial.

Strategy 1: Encourage Agronomy Department faculty involvement in the developing University agroecology/environment initiative.

Strategy 2: As resource availability allows, develop greater capacity in crops that could serve to diversify agricultural production systems in Iowa.

Success Indicators:

- Development of a new CRIS project that emphasizes a total system approach to crop production
- Acquisition of external funding to support projects and programs that emphasize a total system approach to crop production
- One new faculty FTE committed to non-corn/soybean crops and crop systems

Goal 3: Create opportunities for the department to lead dialogue and discussion of agricultural/environmental issues with traditional and non-agricultural clientele.

Strategy 1: Hold field days and workshops focusing on topics relating to agriculture and the environment. Invite selected clientele from both the agriculture and non-agriculture sector.

Strategy 2: Create educational materials, targeted at the non-agricultural population, which describe challenges faced by producers, the concept of agricultural sustainability, and the role of science in addressing the challenges.

Success Indicators:

- Three field days/workshops that synthesize environmental issues with crop production issues
- Development of an "agricultural sustainability" page for the departmental website.

Goal 4: Acquire greater capacity in spatial analysis, geographic information systems (GIS), and precision farming

Strategy 1: Seek to fill a faculty position with an individual having expertise in spatial statistics and GIS.

Strategy 2: Establish and staff a GIS laboratory in the department for use by all departmental faculty, students, and staff having interest in applications of GIS

Strategy 3: Offer courses in agronomic applications of GIS techniques.

Strategy 4: Link with other departments on campus to develop cooperative programs in applications of GIS technology

Success Indicators:

- Successful filling of a faculty position (most likely the vice-Fenton position upon his retirement) with an individual having expertise in spatial analysis and applications of GIS
- Establishment of a GIS laboratory in Agronomy Hall
- Development of two courses in agronomic applications of GIS, one at the undergraduate and one at the graduate level

Goal 5: Establish a long-term, large-scale research and demonstration site that provides a means for the integration of research activities and the publicizing of results.

Strategy 1: Continue to encourage faculty participation in the College "agroecosystems" initiative, with a focus on identifying an array or research objectives and protocols that would employ such a site.

Strategy 2: Identify potential sources of funding, such as NSF, and work to acquire the funds to establish a center for agroecosystems research and demonstration.

Success Indicators:

- Identification of a long-term agroecological research site near campus
- Acquisition of College and University support for such a site
- Successful acquisition of external dollars

ISSUE 4: Departmental Culture and Community

There is some concern that the size and design of the building and the number of faculty and staff in the department work against the development of a strong sense of community. Although there is little that can be done about much of this, encouraging a general attitude of openness and collegiality is something that the Chair can do.

Goal: Increase the sense of community throughout the department

Strategy 1: Establish a "social committee" charged with planning a variety of social events for faculty, staff and students for each academic year.

Strategy 2: Continue and expand programs such as "take a professor to lunch" to encourage communication among faculty, students, and staff.

Strategy 3: The Chair will continue to "set the tone" and support social activities and an attitude of open collegiality through a variety of mechanisms, including regular faculty retreats.

Success Indicators:

- Establishment of three well-attended social events annually
- Annual retreat-type activity focused on a specific areas/topics

APPENDIX A: THE PATH TO THE FUTURE

The "Path to the Future" describes the process and plan for utilizing the anonymous endowment to the Agronomy Department. In 1999, the endowment was valued at approximately $80 million and was received with "no strings attached." In fact, the only real limitation on expenditures was that the endowment was not be used to replace dollars received from existing funding sources. In other words, these are powerful dollars, the flow of which can always be targeted for the greatest impact.

Planning for how to utilize the endowment to make the Agronomy Department the best it can be was requested by the president and conducted by the Department of Agronomy and members of other departments. The document evolved through seven iterations punctuated by external reviews by "visionaries," agricultural experts, various other clientele groups, and of course, the faculty of the department. At completion, the document was sent the President of Iowa State University via the College of Agriculture with over a 95% approval by the faculty of the Department of Agronomy.

Considering the department's long range plan, the endowment characteristics and input from external sources, the department decided to establish four initiatives; Integrated Studies of Agroecosystems, Excellence in Agronomic Education and Extension, Integrated Approaches to Plant Improvement, and Global Agricultural Science and Policy. The goals were: to have, within these general areas, self-forming groups establish around needed areas of endeavor; to promote interdisciplinary approaches to these areas of endeavor; and to foster creativity and risk-taking. Finally, the plan resists establishing structures and systems that may become outdated as science and technology evolve. In fact, one of the goals for the "Path to the Future" is to allow for change and evolution, both in terms of the science and systems that support the science.

APPENDIX B

THE PLANNING PROCESS

Summary Notes

APPENDIX B.1: Department of Agronomy Scenario Planning Process, 2002-2003
Anticipatory Decision Making

Why are we doing this?
By creating several scenarios that represent different, hypothetical futures, we can investigate the department's strengths, weaknesses, and possible responses to challenges that may arise. Scenario planning allows the department to explore options before they happen.

During the scenario planning process
Don't assume any scenario is the "right" future: Scenarios are to be used as points for discussion. That is, we need to consider how the department would respond if a particular scenario became true.

We want to develop 3 scenarios
These scenarios should (1) be provocative to engage faculty in serious discussion of the department's future, (2) not polarize participants or offend faculty or stakeholders in the department, and (3) allow us to consider options so that we can proactively alter or be prepared to deal with the future.

Scenario Planning Steering Committee
Panel Chairs: Allen Knapp, Bob Horton, Randy Killorn, Mike Lee, Mike Owen
Initiative Coordinators: Lee Burras, Ricardo Salvador, Gene Takle, Charlie Brummer (chair)

Scenario Planning Process

2002	July	Committee drafts several scenarios
	**Sept*	*Request input from whole faculty on basic scenarios (Please send comments to brummer@iastate.edu by 13 September)*
	Sept-Oct	Teams of 5-6 faculty/staff develop possible departmental responses given the conditions of each scenario
	Nov. 25-26	Faculty retreat (Mon/Tues of Thanksgiving week)
2003	January	Scenarios presented to CSREES review team
	Feb-March	Meetings around state with stakeholders
	April	Committee assembles comments
	May	Faculty retreat to discuss feedback
	June	Finalize scenarios; develop report

Three Potential Scenarios
The scenario planning committee has drafted three possible future scenarios. We would like to have input from the faculty regarding specific comments on these scenarios and other possible scenarios individuals would like to propose. The committee will work with the initial three scenarios and any comments that are forthcoming to develop the scenarios which will be used to develop departmental responses.

At this point, we are only trying to develop the outlines of scenarios–that is, hypothetical landscapes the department may face in the future. They should be widely diverging possible futures; at this point, we are considering neither the effect they will have on our department (e.g., on budgets, on student enrollment, on research direction, etc.) nor the department's response to them. We will attack these issues later in the process.

***Step one*: **We attempt to develop clearly differentiated future "landscapes" that reflect the context within which the Agronomy department will exist and will need to respond.**

Step two We will think about the scenarios and develop responses to them–i.e., given "x," what could/should the Agronomy Department do about it?

Scenario 1. Agroecology drives change

Over the next ten years, a number of intersecting issues raises Iowans' (and Americans' generally) concern about environmental quality. These issues include nitrate levels in drinking water, hog and poultry confinement and cattle feedlot operations, the development and release of transgenic crops, the dead zone in the Gulf of Mexico, the increasingly erratic weather, questionable farm programs, among others.

In conjunction, citizens will desire *multifunctional* agricultural systems that provide a variety of services to the nation, in addition to producing food. *Agroecosystems* will also be aesthetically pleasing, sustain farmers and vibrant rural communities, perform desirable ecosystem services (such as purifying water and retaining soil), facilitate human interaction with the landscape (in terms of parks, hunting and fishing, and other recreational uses), and other nontraditional uses.

Public questioning of governmental policies seemingly at odds with movement toward environmentally friendly agroecosystems sustaining economically viable rural communities will lead to a dismantling of traditional farm price support policies. As a result, the need to diversify the crops–and the means used to grow the crops–in the agricultural systems becomes absolutely essential.

The upshot of this changing public sentiment is that the Department of Agronomy is being looked upon as both a source of the problems and a source of the solutions. The Department's clientele grows much broader and more diverse than in the past, to include intimate connections with various urban groups, including environmentalists, property developers, etc.

Scenario 2. "Feed the world" returns

Over the next ten years, increasingly erratic weather throughout the world will lead to recurrent crop loss both in food exporting and importing countries, resulting in uncertain food supplies for large sectors of the globe. Paradoxically, the large commodity surpluses in the recent past have spurred research and development into alternative uses for this production, in the hopes of increasing demand and in turn, price. Thus, the development of a multitude of new uses for major commodities, coming at a time of less reliable crop production, will lead to a situation where the United States has a more limited need or

ability to export its agricultural production. With commodity prices rising above governmental subsidy levels, the pressure for reforming farm programs diminishes, and growing commodities once again becomes generally profitable for farmers.

Disturbingly, mounting population, limited water, and crop production failures occur throughout the developing world, causing political instability and potential and real famines. These humanitarian disasters again resurrect calls for a renewed green revolution and some way to feed the world. Industry, if for only public relations reasons, vigorously promotes a "public-private" complex to attack the problems head-on. Public leaders agree. The application of cutting edge technology–precision farming, biotechnology, etc.–becomes the spoke around which other research is organized.

Thus, a combination of factors coalesce to move the Agronomy Department to focus its energies on developing better ways to improve the major commodity crops. The Department works closely with the agribusiness industry and with commodity groups to further improve the crops.

Scenario 3. Increased emphasis on basic research

The usual set of natural and social forces continue to shape the agricultural systems of the North American plains in predictable and unpredictable ways. A decreased percentage and absolute number of the population are directly involved with agriculture. Public 'hard' money for agricultural research and education continues to decline while public awareness of the real and potential effects of agriculture increases. Eventually, the political infrastructure of the agricultural subsidy programs erode to the point at which there are significant reductions in those programs, worldwide. Finally realizing the adaptive strength and educational value provided by mission-oriented basic research, there is an increased demand by society for clear, unbiased and objective basic biological information and understanding about the agricultural systems, the components of the systems and the relationships among the components.

APPENDIX B.2: Small Group Worksheets - Review of Scenario Discussions from November 2002 Retreat

Scenario 1: Agroecology drives change

1. **How would you change this scenario to make it both more realistic and more encompassing of probably future events affecting the Department of Agronomy?**

    - The regulatory future of agric-environ. issues needs to be described more explicitly.
    - Elaborate more on funding sources (see page 2, #8)
    - Alter the statement that Iowa is an "urban" state – recognize that farmers recognize that they have environmental problems that must be solved. Make farmers a partner. Move employees from PS to landscape management. Discuss the advantages of having more niche markets and alternative crops but do not deny that corn and soybean production will still be important.
    - Eliminate concept of IA as urban state. Document role of C in ecosystem. Need correct mix of people.
    - I'm skeptical of the extent to which citizens/taxpayers will want to sustain farmers/rural communities or aesthetically pleasing landscapes – provide more justification for these possibilities.
    - Society's increased value on the environment will drive more emphasis on agroecology.
    - Research weaknesses: Points 6, 8, 9, and 10 may not be relevant. Raw data important in agroecosystems studies. Infrastructure for this is lacking. Integrated framework required. Publication not always possible in long-term agroecosystems research. Verify research is worth doing.
    - Emphasis the value of milking data for all it's worth through integration, synthesis, modeling and deeper analysis.
    - Is based on assumption that production goals will continue to be met – either by us or others. If not, food will not be cheap. Need to resolve food and economic security versus sustainability. Rephrase "Iowa is an urban state." Fatal communication flaw. Assumes commodity funding will disappear and com.-focused research with it.
    - Scenario 1 narrowed to environment, while scenario 2 goes completely into technology Ag (biotech, etc) – something intermediate might be more appropriate – scenario intended to encompass many technologies. Shouldn't we balance Scenario 1 with 2?
    - Conservation practices and its impact on changing the agroecology. CO2 emissions and its relation to carbon credits.
    - I think this complete conversion to agroecology may not be a good idea. I would think that we may start agroecology as a program to begin with. This will also allows us to evaluate the importance or need. Without changing the identity or mission of the department.

2. **How would you improve this scenario to make it more applicable to what's important to the Department of Agronomy?**

- Point out what resources would be needed – farm labs etc.
- Need more emphasis on high yield (to reduce land devoted to crop production)
- I would not call the type of faculty we need as "generalists" but as "communicators". They still need to be specialists, and even reductionists, but they need to be able to communicate with other reductionists.
- Can't lost traditional support – have agroecology as strong emphasis, not sole focus.
- Agroecology is broader than Ag department. Research threats 2 and 4 questioned. #2 – often language "may be opposed" should this be college level initiative? #4 – External organizations that benefit from status quo would oppose this. Collaboration is difficult. Upfront time investment required. Payoff potentially great. Sustainable ag – is this different? We don't have undergrad program. Agroecology is broader than sustainable ag – high input okay. Value connotation removed with agroecology. Departmental reorganization in biology is opportunity for integration. Triple bottom line – whole system accounting.
- Identify the deliverables and products that will be of interest and benefit to the general public.
- Define overarching objectives – disciplines, technologies needed. Structure team responsibilities around objectives. Combine components of scenarios 1 and 2. Unrealistic to envision same size or smaller dept. with added focus and maintaining "reductionist expertise." Integration with economics important.
- A scenario that improves things that we are doing now, rather than big changes. Could agroecology allow us to integrate what we are doing? Threat of losing identity and links with current constituents. Reward for integrative projects? Bring collaboration from other departments – integrate with others.
- Redefine the ecosystems to be more inclusive and comprehensive to include the whole system. More emphasis on extension role in a positive way.
- Should be started as a program.

3. **What is the gap between what the Department does now and what the scenario suggests the Department do in the future?**

- Must have the right mix of specialists and truly secured cooperative research to solve problems. Researchers must work with farmers on their farms.
- Need more support (positions, resources) in Ag. Ecology.
- We lack expertise – hyrology modelers – maybe sabbatical opportunities important. Students are not trained broadly – classes in place, but not taken. Lack of teambuilding – overcome existing organizations. Complex systems. Reductionist science still need, but with generalists as well. Identity – must see across department lines. Teams must be emphasized – this represents change in culture, must be rewarded at college level. Land structure works against this because panels work within disciplines – bridging panel – more

management. Tilt lab collaborators – great resource for this. Tend to be integrators.

- We need people who can synthesize/integrate existing disciplines in agronomy; we also need people who have expertise in modeling (physiological ecology, population genetics, population and community dynamics, nutrient and energy flows); and people who can deal with temporal and spatial variability.
- Fit mission? Identity? Who would employ agroecologists? Government agencies – ACE, NRCS. If turned out broadly trained generalists with depth, what would they be called? TAMU, UC-Davis, Purdue grads best generally trained in plans, crops, soils. Data mining and integration could be improved. 1. Diversification, 2. How treat variability? 3. Objectives that drive integration. 4. Balance in appt structure needed. 5. Balance in panel structure. 6. What gets resolved? 7. Personal economics of faculty member.
- Need to tap into expertise across the university instead of trying to encompass everything ourselves. Panels – structure is limiting of integration – tier structure – perception. Does it fit our mission? Department identity. Are the agronomy graduates being hired? Integration of programs at what cost? Inadequate funding is a problem.
- Teamwork and collaboration across disciplines.
- Hire new faculty and initiate on a small scale, to show collaboration among existing faculties – by funding with internal seed money – with the expectation that subsequent groups will obtain external grant money.

4. How well does this scenario align with other plans and proposals for the Department, College of Agriculture, and the University?

- I think it aligns well with some of the endowment objectives.
- Department and college: support for AgEcology emphasis on environment. University: don't know, seems more emphasis on biotech/big money.
- This is what agronomy is supposed to be about. Scale – big – integration. This is a good thing. This aligns well with college goals. Interact with caution to avoid conflicts. Biology reorganization is an opportunity. Compliments scenario 3.
- This scenario matches the rhetoric offered by those units.
- Dept – well (in part). Exclusionary in part; reward and recognition? Panel structure works against integrated disciplines. College – ok. University – not so well. Okay on basic side, okay on sociology side, not on applied side. Agroecology here refers to farming systems wherein photosynthesis, its products, their use and management within the context of ecosystems are managed equally for the benefits it provides to the economy, the environment and society.
- College support for agroecological views – agroecosystem group already formed. Substantial interest for this area in the ASA – CSSA, SSA. Urban state? Rural setting more people want to live in rural communities but more environmental conscious changing demographics.
- This is more realistic among the 3 scenarios.

Scenario 2: Iowa remains a center of low-cost corn and soybean production

1. **How would you change this scenario to make it both more realistic and more encompassing of probably future events affecting the Department of Agronomy?**

    - Expect increasing scientific illiteracy among the public and public officials. Expect increasing demand by stakeholders for short-term results, not long-term goals.
    - Merge with agroecology scenario.
    - Merge sustainability with increased productivity goals; decreasing economic impact. Technology will be more complex. Ecosystems will be more complex. Integration of more science into undergrad curricula. Put economics into this – diversification and it's implications. Have to prepare for a more diverse world and be part of the solution. Don't assume another department will take over each functions.
    - Role and consequences of this scenario to animal production. This scenario would result in considerable change for soil science, more soil fertility, less environmental focus.
    - Undergrad train generalist (white collar). Grad – train specifics, reductionist model. Other things that can be done with grain except feed people. Oil money. Weather stability. Brazil/Argentina – move into new markets. Biotechnology – basic research is small subsection of Agronomy.
    - Research strengths: Item 6 – Change to read: "Department, college and university encourage interdisciplinary research." Weaknesses: Item 6 – Drop "space allocation is not optional." Threats: Item 1 – Drop "have an established headstart in biotechnology research." Item 2 – Drop "Greenpeace is right."
    - (THIS WAS ALL WRITTEN ON THE BACK OF MANY SHEETS BY ONE PERSON) Are we really concentrating on CN and SB? Feed versus food: Animal population remains. (unreadable) products from CN and SB = demand. Should the scenario be fleshed out further? Increased population would not demand increase animal production. Keynote at ASA: demand for meat worldwide will drive demand for feed grain. Demand for protein. The fact htat we are producing max feed grain is correct. When I read this, the notion of "no applied" didn't come through. The land grant mission has been accomplished. Why do away with applied research? There is less state funding for applied research. Industry would do applied research in-house. Integration of industry and university splits along applied/long-term lines. Conservation of resources goes to other departments. Farming will become profitable: seems unlikely. The family farm is gone in this scenario. Create the new knowledge base for agriculture. Our job is that. It will propagate to whoever needs it. Tight integration of industry. Description of the farm scene. Because we lagged behind in generating the knowledge base, the industry created their own labs. Low cost commodity balance between social demands and production governmental regulations will not just go away. Scenario 2: Demand for feed grains high. If we decided we didn't want to

depend on anyone else. Globalization in the scenario? Our potential customers are global. These customers could also go anywhere on the globe. Who are our competitors? Research by contact rather than the way we operate now. We would need to identify our clientele also. Environment is in here, but it's resources are directed to yield rather than habitat for wildlife. Biotechnology and precision ag. Applied pieces to that. Dependent on program if other branches that process CN and SB into other products. How are we going to increase production. Research for per unit area production. Yes then how do we allocate our resources for that. We have to be unique from industry whereas we are funded by taxpayers. In integrated table threat: public backlash. Some elements of each scenario seem likely. So what will we do with that. These scenarios are not very far out. Average age of farmers is 54 years. In high production environment needs nutrient management, for example, phosphate and potassium shouldn't be brought into the state. To implement 2, you will be forced to implement aspects of 1 and 3. Low cost: global market versus local to USA? In England, in 1820, they looked at USA as USA now looks at Brazil. In Brazil they will degrade their land in the process then we will be ahead. Irrigation in many parts of the world will come to an end. Important to concentrate on research to make the most of central corn belt advantage. Feeding the world relative to relationship with industry. Will only happen if the world can pay. Will scenario force the dept. to become stronger in economics? Gap between now and future. Would we need to deal with economics? Depend on what we think we ought to do. Not much of the processing on commodities comes back to the farmer. The farmer still gets bottom dollar. This scenario would be bleak for the family farmer. What do your models tell you about the climate for Iowa? Both warmer and wetter whereas Southern US will be both warmer and drier. Iowa will still be suited to CN and SB. CO2 will double in 70 years. C4 grasses will do well. It's happening now, rainfall increases by 10% over the last 30 years. If we want to prepare for the future, given the size of the department, different people will be doing different things. We hope to identify parts of the department to identify how to address different inputs of the scenarios. Iowa will be a place to produce commodity crops: CN and SB for a low profit margin. No one can answer why Francis Child can get 500 (unreadable). We do not have good infrastructure to integrate discussion. Kendall's office is 2.5 blocks from (unreadable). Collaboration: it has to be worthwhile to get together. The successful teams: somebody put them together and everybody knows what role they have to play. This can't be legislated. People make it/people break it. In university system we have freedom. The problem is how to get the funding. The funding is the glue. Funding agencies say they want innovative high risk proposals, but they don't mean it. Seed money: A barrier that we have it that we use disciplines rather than solving problem. We all do research, we can public and get accolades. We don't interact with the producers to know their problem. Ensure that we are very nimble. Flexibility if state funding decreases and industrial funding increases, then what? Extension: is the land grant mission ever fulfilled? But now, what is the role of extension? Train the trainer. Industry is a big part. Maybe there would be no outreach at the university level. Extension should bring farmers

ideas back. Public demand for solid information on biotechnology. Public education around issues. Who will train the extension people? Does society want this? They will have to step up and pay for it. So do they really want this? Urban people are not interested in production but environmental issues. The extension program would have to setting the high production system we will be implementing.

2. **How would you improve this scenario to make it more applicable to what's important to the Department of Agronomy?**

    - Include environmental impacts.
    - More agronomists will be needed to support fewer farmers. Intelligence and problem solving ability a premium. Definition of "yield" with economics, complexity analysis. Have to do some things better than we are doing now. Integrate ecological components – develop technological expertise.
    - Point out that this would force the dept. to become more dependent on contracts and grants.
    - Needs to be broader. Government position is a big variable. Supply and demand is cyclical. Price will vary significantly. For next 7 years – commodity will be based on yield. Change title. Applied scientist on MS and PhD must be trained elsewhere? If industry will be applied research – must be connection to basic research at university.
    - Teaching: weakness: Item 3 – change "all adept" to "less competent." Outreach: weakness: Item 3 – Drop the parenthesis statement (the famous ___) not clear what is meant by parenthesis. Opportunities: Item 1 – Not in agreement with Item 1 of strengths, not clear what Item 1 means.

3. **What is the gap between what the Department does now and what the scenario suggests the Department do in the future?**

    - Not much – we're doing it already.
    - Producers are proud of the fact that Iowa is #1 in production. Assumes agronomy department needs to produce qualified individuals to support production. Students coming to dept., now are not thinking LT, but traditionally. Need to attract non-farm background. Students must see both production and env. Issues as a whole. Structures presently doesn't facilitate this.
    - More expertise in economics would be needed? Extension should do more to educate urban citizens.
    - Gap: A) refocusing department; How get trans genes to useful germplasm. B) Basic research at MS and PhD level versus white collar agronomist. C) Hard to separate for environmental quality – government may prevent max production or public option. D) profitability. Can we have increased yield and environmental quality at same time?
    - Departmental organizations: weakness: Item 3 – Disagree with the premise. There is a system to relocate resources. Item 4 – not clear what it means.

Item 5 – Would be a big mistake to have a person designated as an industry liaison.

4. **How well does this scenario align with other plans and proposals for the Department, College of Agriculture, and the University?**

    - Don't know – probably aligns as long as it brings in money.
    - Lack of overachieving objectives in department. Not at odds with dept. or college direction to increase productivity in an env. Friendly way. Drive for biofuels if oil prices increase at all levels. Industry will not be able to do nutrient (unreadable) research. Source of funds? Industry looks for income from # acres/unreadable, not from fewer producers.
    - Doesn't align well with other department and university. Aligns with PSI.

Scenario 3: Basic science prevails

1. **How would you change this scenario to make it both more realistic and more encompassing of probably future events affecting the Department of Agronomy?**

    - Society/clients not prepared to assimilate/use basic info.
    - Remove bullet #4 under weaknesses in teaching. This is an untrue assumption if it is a statement about current situation.
    - Indicate greater pressures on faculty to support their research with federal funding.
    - Basic Science needs more promotion to attract qualified students.
    - Outreach: Weaknesses: Item 5: Extension has very good outreach program through ESET. Cannot agree with current premise. Integrated assessment: Weaknesses: Item 6: Do not agree. System exists, but may not be used effectively. Item 8: Do not agree that senior faculty have insufficient input.
    - Cropping carbon down? Land-grant mission has been fulfilled.
    - Multiple approach – putting teams together of basic and applied research. Strengthen applied/adaptive research capabilities – increase value throughout system (dept – College – university)
    - Link to applied. Make it not "basic" exclusive.
    - Recognize that the financial reality of basic research being an increasing source of support may conflict with the political need to continue to offer research, education and outreach in applied science.
    - Scenario is not realistic as proposed. To maintain the trust of the Iowa public, there should be a marriage between basic and applied research.
    - I believe that we will see increasing scientific illiteracy among the public and public officials. We will also see increasing demand for short-term payoffs for the investment that "society" puts into institutions of higher education. Therefore, a shift to a basic research emphasis will fail utterly.
    - Basic and applied science go hand in hand. Basic science informs of sparks and applied tests basic knowledge in reality. Divorcing the two would weaken both. Diversity/multiple approaches are desirable, a strength of a department and university.

- Emphasize rather than degrade the undergrad program. Continue to use agronomy undergrad education as a bridge between basic science education and technical education. Help students apply their knowledge of basic science to solve practical problems.
- Bridge basic and applied science gap.
- Go for basic research dollars and have applied sponge off the basic (unreadable).
- Department seeks to remain true to its mission despite shifting funding and politics – to do so, the department is restructured around basic-applied teams.
- Major assumption is that funding will be available only for basic research. That goes against our mission. I doubt this is true. Too extreme view.
- Conform to mission of land-grant institution. Continue applied research. Multiple approaches are advantageous.
- Continue to do applied research and promote teamwork and collaboration among applied and basic people.
- Basic science continues to be a component in the continuum of activities conducted in the department.
- Creation of peer review process. Where funding comes from. Basic research, define basic/applied.
- I agree with the possible change for improvement – of agronomically important crops such as corn, soybean, with the application of basic research. I think we should not consider a plant specialty for basic research if it is not a crop species.
- Define the forces/avoid basic versus applied contrast/need to define the mission(s) and how to ensure the mission(s) are pursued/focus directly on crop SPP/define basic (i.e., understanding)/provide better description of assumptions.
- Include a section of issue groups to determine applied demands that drive basic research.
- Better definition of basic research. Role of extension in such scenario.
- Elaborate what the "usual set of natural and social forces" are. Provide a scenario for the funding of the basic research. Elaborate in the scenario about what market or political forces would lead to funding of basic research.
- Give a functional definition of basic research. Define who the department serves – farmers, society, funding agencies.
- Need to define basic research with parameter to cover crop-based ag application (potential for ag application.)
- What is the "usual set of natural and social forces"? Basic versus applied? What is mission oriented basic research? Basic – improved understanding?
- This scenario seems to have academia as its primary client. Realistically, the client needs to be some segment of the public.
- Spell out where future funding sources would come from.

2. How would you improve this scenario to make it more applicable to what's important to the Department of Agronomy?

- Provide method to facilitate information outreach/transfer to clientele.

- Lacks a mechanism for priority setting. The organizing principle of mission-oriented research is too vague to provide future direction. Weakness in research that external funding sources may not support the areas of research that need to be conducted to meet our mission. This approach may lead to chasing funds at the expense of departmental goals.
- More facilities and equipment to make department competitive – can't always get on grant.
- Threats – Item 4: do not agree. Independent research activity is encouraged with basic research. Department organization: weaknesses: Item 1: Disagree, one chair should be able to handle internal activities, if he/she properly delegates responsibility to the staff.
- Try to set the agenda ourselves – not just NSF. Involve our stakeholders.
- Link to applied. Make it not "basic" exclusive.
- Create strong links between basic and applied research.
- Get pairs of basic scientists and applied scientists to seek funding together and work on problems together.
- I like very much the idea of basic/applied faculty pairing up to conduct research.
- Make broader approach.
- Develop ways to channel that funding to do the integrated basic and applied research, education and extension we are supposed to do.
- Form basic and applied teams. Seek funding from basic science with applied component.
- Continue educating basic BS level agronomists.
- Department has to define overarching objectives. Mission, history and current reality all play into determination of these. ID of basic applied, outreach, and other activities necessary to accomplished objectives. ID sources of resources follows assignment of tasks or pairings of collaborative teams follows.
- Link basic through applied as seek external funding.
- USDA grants ask for how grant request will impact US agriculture…research faculty are described as a class of faculty. Long term goal - applied goal. Mission statement for each scenario. Use a hospital analogy. Issue teams to guide the basic science.
- Each mission oriented program should have an applied goal to serve the basic objectives of the department. With that goal, we carry out basic research to reach that applied goal.
- Define what is important to department/use issue teams to interact with clientele to help focus and define mission.
- Concept of research teams – PI, one in charge.
- What is important to the department of Agronomy?
- The department needs to develop a mission.
- I think it's important to describe how a new prof. Would gain support to be promoted.
- The changes in organizational structure need to be explained if such scenario occurred.
- Define role of application of basic research, if any. Develop issue teams to define mission for basic research. Probably would result in larger research groups lead by a small number of PI.

- Basic science – to reach applied goal. Not clear what's important to dept. of agronomy.
- Need a mission statement to do with the department. Where does funding come from?
- More emphasis needs to be placed on "product delivery" to a more clearly defined client base.

3. What is the gap between what the Department does now and what the scenario suggests the Department do in the future?

- Greater emphasis on grant writing. No help to prepare/write/review grants currently available.
- Decrease undergrad students – decrease funds to department
- Scenario expects (perhaps) greater percentage of undergrad majors being basic-science focused (e.g., intending to go to grad school). This is heavily dependent on assumption that public awareness and interest in ag potential increases. Weakness for dept. may not be lack of senior departmental administrators, but overburden of paperwork – too much accountability?
- More individual grant writing would be necessary.
- Support facilities – maintain labs.
- Item 5: provide evidence this is true. Disagree with the premise. Item 9: Not too much external activity, if chair knows how to say no. Safe priorities, and involves faculty for external functions.
- Need to solve problems – mission-oriented issue team. Could educate the group about biotechnology. Outreach – new clientele – urban people.
- We do it well now, the department has sufficient positions/staff/resources in basic research: the basic researchers should help determine the state of basic research (if we need new positions).
- Setting up overlapping goals that make a seamless path for money and ideas from basic – applied.
- We don't have strong basic science programs distributed evenly throughout the department.
- Big gap.
- Reward system must be changed to encourage team projects. Faculty members must be trained to cooperate and collaborate with one another.
- Wide gap – now applied/basic.
- Concern that if department goes this route, the support of the community (state, taxpayers) will disappear. Positions in future hired filled with basic scientists.
- Applied research, training agronomists.
- More basic research to be carried out.
- Now is too short-range and no real prospect of long range in the future from any public or private source.
- Complete restructuring of the department. PhD section leaders with 4 or 5 PhDs working for them.

- Organizational structure and research model will have to change to accommodate larger more (unreadable) funded labs. We will have fewer faculty and more soft-moneyed support staff.
- Lack of support staff, internal funding, internal organizations to solve problems.
- Organizational structure – more staff, fewer PIs.
- Stronger link between undergraduates and the graduate faculty.
- I think the position of small grains breeder would have no place in this scenario.

4. **How well does this scenario align with other plans and proposals for the Department, College of Agriculture, and the University?**

- Counter to civic directions.
- We have been abandoned by college and university.
- Same situation at the university – emphasis on basic research. The college and department continue emphasizing the land grant mission.
- Not well, but it is workable with much more strategic planning.
- The university embraces it, the college tolerates it, and the department is threatened by it.
- Aligns with university expectations but does not fit the global objectives and goals of the college and department.
- I agree with comments expressed in our discussion.
- It doesn't with college and department.
- 180 degrees from department and college plans. In line with university past administration.
- University – basic science emphasis; college and department – more integrated.
- Fits with preference of university for grants with high overhead (NSF). Similar to scenario 2.
- Constituents expect whole range of basic to applied with information that effects their lives and success.
- It will be comparable to ones carried out in Zoology Genetic department, where basic research is the main emphasis for maize for example.
- As the scenario is written it doesn't align with the other 2 at all.
- Engagement is the current goal of the university administration. This scenario reduces the opportunity for engagement with our clients.
- It was pointed out that this scenario was most wide open. Related to this (I think) is the fact that our discussion of this scenario was frustrating (to me). The frequent back and forth on what is basic research could have been avoided by giving more background to the scenario, explaining more fully what larger external forces pushed the department in the direction specified. The other scenarios have more scenario development. More of a story about why some force or other became important.

Scenario 3: Basic science prevails

1. **How would you change this scenario to make it both more realistic and more encompassing of probably future events affecting the Department of Agronomy?**

    - More cyclical – instability – not always a storage – title – high yield goal.
    - May not have less students – BS/MS level. Problem solving, interactions will require the science to decide. Industry will not do environmental issues, the university will do it. Integration of industry doesn't seem…high yields within sustainable systems. Methods.

2. **How would you improve this scenario to make it more applicable to what's important to the Department of Agronomy?**

    - No answers.

3. **What is the gap between what the Department does now and what the scenario suggests the Department do in the future?**

    - Transgenes – package – long-term work; education and grad student education and research
    - The reward system for faculty does not support or encourage research on integrated system.

4. **How well does this scenario align with other plans and proposals for the Department, College of Agriculture, and the University?**

    - Greater emphasis is being placed on systems and indications are this will continue. This may be the most realistic scenario.

APPENDIX B.3: Some Common Themes from the Three Scenarios

Numbers in parentheses identify the scenarios (1=Agroecology; 2=Feed; 3=Basic).

Research

Research – Strengths

1. Extensive research capabilities, experience and knowledge base that could adapt to several scenarios (1, 2, 3).
2. Endowment (1, 2).

Research – Weaknesses

1. Interests, background and adaptability of faculty (this seems to contradict item one in 'research strengths' but see 1, 2 and 3).
2. Size and culture not conducive to collaborative activities (1,3).
3. Physical 'layout' and allocations of Agronomy Hall (1,2,3).

Research – Opportunities

1. Technology transfer and economic development (2, 3)

Research – Threats

1. Change alienates one or more groups of 'clients' (1, 3).
2. Competition/overlap with on- and off-campus institutions (1, 2, 3).
3. Lack of support/recognition for collaborative research (1, 3).

Teaching

Teaching – Strengths

1. Experienced and some 'dedicated' faculty teaching at UG and GR levels (1, 2, 3).
2. Graduates in demand by public and private sector (1, 2, 3).
3. International connections (1,2).
4. Distance education experience and some capabilities (1, 3).
5. Endowment (1, 3).

Teaching – Weaknesses

1. Are we attracting 'the right mix' of students (e.g. diversity, aptitude, interests, qualifications)? (1,3)
2. Courses place too much emphasis on technical/production agriculture (1, 3)

Teaching – Opportunities

1. Increased demand for education and graduates (1, 2, 3); especially for those with backgrounds better suited to adaptation to change and complexity (1, 3).

Teaching – Threats

1. Alienate/lose traditional sources of students and employers (1, 3).

Outreach

Outreach- Strengths

1. Existing infrastructure and personnel (i.e. we still have a functional 'extension' program; 1, 2, 3).
2. Public perception of ISU as an impartial source of information (2, 3).

Outreach – Weaknesses

1. Lack of connection between research and extension (2, 3).
2. Lack of support/reward/recognition/understanding of extension by ISU (1, 2, 3).

Outreach – Opportunities

1. Increased demand for outreach by various groups of 'clients' (1, 3)
2. Revitalize outreach (1, 2).

Outreach – Threats

1. Common theme?

Departmental Organization

Dept Org. – Strengths

1. Current leadership by 'Head' (1, 3)
2. Size and breadth provides expertise and flexibility (2, 3)

Dept Org. – Weaknesses

1. Excessively broad range of expertise/interests/factions/empires hinder efficiency (2, 3).
2. 'Cloudy' administrative structure/functions/domains and diffuse responsibilities with panels, initiatives, centers, programs and empires (1, 2, 3).
3. Too little administration to support the array of activities (1, 3).

Dept Org. – Opportunities

1. Common theme?

Dept Org. – Threats

1. Decentralization: too many responsibilities and external activities for current administrative 'team' (1, 3).

Integrated Assessment

The Basic Research Scenario group devoted relatively little effort into the section 'Integrated Assessment': the text for that section for that group was produced by one person and it was not reviewed. So, the following common themes apply only to scenarios 1 and 2.

Integrated Assessment – Strengths

1. Endowment
2. Students in demand by various institutions in public and private sectors
3. Broad experience and capabilities in teaching, research and outreach.

Int. Assess. – Weaknesses

- Difficulties with changing roles, assignments and responsibilities of personnel

Int. Assess. – Opportunities

- Increased interest and support of agriculture that promotes sound environmental practices

Int. Assess. – Threats

- Loss of contact with and alienation of public and other 'clients