**APPENDIX 13: CA&ES Faculty Review of the Agricultural Sustainability Institute**
*(ASI comments and replies inserted in blue italics.)*

To: Interim Dean Mary Delany
From: Agricultural Sustainability Institute Review Committee
Date: September 17, 2013 *[ASI comments: November 14, 2013]*
Re: Review of Agricultural Sustainability Institute

ASI has a broad mandate to address sustainable agriculture. The committee commends the leadership, affiliated faculty and staff for their remarkable efforts. Sustainability is a key if not the central issue facing agriculture and it should become a theme across the college. The limited amount of research funding focused on sustainable agriculture and resource conservation makes the mission difficult however, and the College should advocate externally for more support in this area. *ASI comment: We are very grateful to the review committee chair, Professor Andrew Waterhouse, and to each of the members of his committee for their hard work, constructive approach, and especially for the very useful comments presented in this report.*

Viewed broadly, the Student Farm is the teaching component of ASI, RR *[the Russell Ranch Sustainable Agriculture Facility]* the research component and SAREP, extension and outreach. The integration and leadership afforded by ASI has strengthened all the units and we would encourage more integration, for instance considering SAREP the extension component of RR, or looking into using RR for some teaching functions. *ASI comment: We generally agree with this broad characterization, while noting that each unit of ASI has roles in research, education, and extension and outreach. Having noted that, we certainly agree that there are important opportunities for further integration; for example, in further development of SAREP as the extension/outreach partner for RR. The planned co-location of some RR staff with SAREP program staff in the Robbins Annex in the campus center will provide greater opportunities for these links.*

The RR is dedicated to addressing the key issues of sustainable farming. Because CAES allocates significant resources to the operation of Russell Ranch (RR) each year, the committee has asked many questions about the RR experiments. We do not question the need for a facility like RR. However, we conclude that ASI needs to have an on-going evaluation of how to best use the RR to advance the ASI agenda, how best to manage the facility, and how to engage more campus faculty in investigating the critical issues of sustainable agriculture. Much of the currently available funds are consumed by two essentially twenty-year-old experimental programs, and it is not clear to us whether these experiments are an opportunity, or a burden and an impediment to developing other programs that might be of greater value. While we note that the two experiments have been changed somewhat recently, we believe that there is little evidence that the two programs have led the way for California, the U.S. and the world to be more sustainable. The 100 year experiment, which is partly on irrigated/high-input versus rain-fed/low input wheat production has resulted in relatively few publications on sustainability – the last major publication specifically on this experiment apparently was in 2004. (Denison, R.F., D.C. Bryant, and T.E. Kearny. 2004. Crop yields over the first nine years of LTRAS, a long-term comparison of field crop systems in a Mediterranean climate. Field Crops Research 86:267-277). The relocated SAFS project, largely a comparison of yields and inputs of organic versus a conventional and “low-input” farming system has generated more publications, but may be somewhat dated in concept. Consequently, the committee recommends a thorough on-going evaluation of all the data and re-evaluation of the best use of RR for the purpose of both

studying and implementing sustainable agriculture. It seems unlikely that the current structure will be able to provide the research data necessary to facilitate ASI's goals of expanding its knowledge base for farmers. Various options should be considered with the goal of maximizing the value of the ranch's output for the benefit of both the College of Agriculture and the citizens of California. *ASI comment: We respectfully disagree with some of the specific points in this paragraph, specifically regarding publication output. However, we entirely agree with the overall point that long-term experiments must be adapted dynamically and that high-impact publications deserve particular attention. This is the purpose of the new science plan (now available on-line (http://russellranch.ucdavis.edu/files/Final%20New%20Science%20Plan%2010-13.pdf) for the Century Experiment (the successor to the old LTRAS/SAFS designs). In the last year (after finalization of the New Science Plan), there has been a substantial increase in faculty interest from UC Davis, as well as from Michigan State, the Jet Propulsion Laboratory, and UC Santa Cruz, resulting in 8 proposals led by associated faculty members and 4 led by Professor Kate Scow. Subject to availability of funding, we would plan to commission an external review of the facility after the new science plan is fully implemented and has operated for at least two years. We also fully agree that engaging more faculty, as well as students and farmers, is appropriate, particularly with the new science plan in place. Professor Kate Scow has served double duty for ASI as both ASI deputy director and RR director since January 2008—all on a voluntary basis above and beyond her duties as a faculty member. Her service during the past 6 years in this dual role has been outstanding. However, ASI's growth and RR program development each have reached a point where this dual service arrangement no longer is optimal. From January 2014, Professor Ermias Kebreab graciously has agreed to serve as ASI deputy director and we are pleased that Professor Kate Scow now will be able to focus her superb scientific leadership on RR. In his capacity as an ASI faculty fellow, Professor Neal Van Alfen has agreed to work with Professor Scow on further development of RR science programs, broadening engagement with CA&ES faculty at RR, and on endowment activities such as our "Adopt-an-Acre" program.*

To succeed in making sustainable agriculture a major theme in CAES, more faculty should become involved in these issues and increasing faculty use must be carefully considered in the evaluation of RR. It is our observation that successful projects at UCD greatly benefit from faculty sponsor/s with a vested interest in the funding, execution and publication of the project—RR experiments needs such involvement. The ASI has already worked on increasing faculty participation, but more should be done to welcome and facilitate faculty research in order to expand those who are studying questions of sustainable farming. The need to expand faculty use should also be considered in evaluating the most effective management structure for the operation of RR. The UC Sierra Foothills Research and Extension Center, for example, seems to work well with a superintendent who is engaged in experiments at his site, in close touch with PI's when issues come up. *ASI comment: We are grateful for the endorsement of our efforts to make RR a more welcoming venue for faculty (and student) research and appreciate the review committee's recognition of our progress in building faculty involvement in RR and use of the RR online database. As mentioned in the previous comment, we are focusing and expanding RR leadership efforts to engage CA&ES faculty. In the past year, 67 faculty, extension specialists, and farm advisors have visited RR and/or had meetings with our staff about research opportunities and several have written proposals or are considering doing so. Our superintendent Israel Herrera is actively involved in research design and sampling, and collaborates directly with researchers to support their activities at RR (similar to UC Sierra Foothills); we feel his expertise and experience is a unique asset of RR. It also is worth noting that, thanks in large part to leadership from Professor Scow, RR also is hosting projects from Stanford University and research projects are in development with the Lawrence Berkeley National Laboratory and the Lawrence Livermore National Laboratory.*

New statistical methods might greatly enhance the usable information that can be extracted from past data, and a committed faculty member focused on Systems Agriculture would be a key to full utilization of past data and optimizing future experiments. *ASI comment: We are pleased that the committee endorses the efforts we've been making to expand our repertoire of statistical approaches for analyzing RR data. We are optimistic that the current Plant Sciences search for a faculty member in agroecology will bring a new colleague who will engage in research at RR and contribute new methods and novel perspectives. Moreover, we are excited by the prospects for innovative use of the unique RR datasets by researchers at UC Davis as well as across the planet, since these data now are available freely on the RR webpages of the ASI website. RR research staff now need to work with ASI communications staff to ensure that we have means to document international uptake of these data and to document resulting scientific publications.*

There are many questions to address in sustainable agriculture, and many of those can and should be studied by individual investigators or small teams, at RR or elsewhere. The Institute has the mandate, capacity and resources to address larger questions that involved integrated approaches to sustainable agriculture. With its current resources, ASI is in a good position to focus its attention on those larger, systems-based integrative studies that require multiple investigators and disciplines. *ASI comment: We agree and thank the committee for calling out this important scientific role for ASI. We feel that the emphasis on energy/climate, water, and soil in the new science plan for the Century Experiment at RR exemplifies the larger, integrative topics that must be our priority. It also is noteworthy that campus investments in upgrading water wells at RR and collaboration among faculty, students, and staff to install new irrigation technologies and sensors at RR have substantially increased RR capacity to address these challenges, which are so important for California and our planet in the 21$^{st}$ Century.*

While SAREP is not a part of our formal charge, its integration into ASI makes it difficult to ignore. Current activity in support of building large integrated research teams to study sustainable agriculture issues is very commendable. These efforts are the most direct means to include faculty in the ASI, and the team members should be further integrated into ASI (see below). So, these efforts should be expanded. In addition, SAREP should be the State leader in the extension and outreach of sustainable agriculture research and resource conservation. One avenue to that is via tighter collaboration with ANR, to reach farm advisors and other stakeholders statewide. The ASI should be seen as the resource for such information by those partners. *ASI comment: We are grateful that the committee included SAREP in its review and strongly agree that SAREP's reorientation over the past 6-7 years has put our ANR statewide program on a promising trajectory. We also feel that the new SAREP Solution Center for Water and Nutrient Management, which is a direct outgrowth of our California Nitrogen Assessment, holds much promise as a vehicle for meaningful, solution-driven collaboration with farm advisors, other ANR colleagues, California farmers, and other stakeholders. The modular Solution Center approach, which we have developed with guidance and support from faculty, farm advisors, staff, and ASI external advisory board members, can be replicated to address a wide range of sustainability issues spanning SAREP themes as funding sources are secured.*

It is great to see that the Student Farm has become wildly successful with growing student interest in sustainable farming. College support for teaching is allocated on a 3-year schedule, but exceptions can be made in unusual situations such as the explosive growth in the Sustainable Agriculture major. A plan to manage that growth should be developed and a staffing plan to manage that number of students at the Student Farms should be discussed with the Dean's office. The success of the Student Farm as an example of a sustainable operating farm could be a message in extension and outreach. *ASI comment: It is deeply gratifying to*

*receive this strong recognition and praise for our Student Farm at UC Davis and more broadly for ASI activities in education and leadership. Mark Van Horn currently serves as both Student Farm director and academic coordinator of ASI's education and leadership theme. With the rapid growth in student involvement at the Student Farm and the similarly rapid growth in the Sustainable Agriculture and Food Systems major, as well as the launch of our Inter-institutional Network on Food, Agriculture and Sustainability (INFAS) in the past two years, we feel it is an appropriate time to elevate the visibility of our education and leadership theme within ASI and to articulate this cluster of activities in relation to the core experiential learning activities of our Student Farm. The review committee's suggestion that ASI develop a staffing plan to manage growth across these programs is well-taken and very timely. Director Van Horn will work with Student Farm staff and faculty colleagues to develop a broad proposal for staffing for consideration by the CA&ES dean's office. This will include staffing to meet the rapidly expanding needs in three inter-related and mutually-reinforcing sets of activities: staffing for experiential learning and practical demonstrations at the Student Farm, staffing for ASI's education and leadership theme, and faculty appointments to maintain educational quality within the Sustainable Agriculture and Food Systems major. We will work with the SA&FS committee-in-charge, the home department (Human Ecology), and the dean's office to ensure sufficient support for teaching within the major during this period of rapid enrollment growth.*

ASI has a well-organized external advisory group and their involvement has brought many benefits to the institute. At this point the ASI should focus on increasing faculty involvement. While this can be somewhat tricky, with an appropriate mission and appointment by the Dean, an advisory committee could support the ASI on all facets, including RR, the Student Farm and to some extent, SAREP. This committee could both advise the director and advocate for the institute. The members of this committee should include those heavily involved in ASI activities which may not necessarily be the faculty designated as the Sustainable Ag faculty presently, but most likely identified via involvement in ASI related research. There are different models of faculty involvement on institute/center boards on campus that can be considered. For instance the Robert Mondavi Institute has an advisory board with faculty and external representatives. *ASI comment: We strongly agree with the review committee's conclusion that the distinguished members of ASI's external advisory board have provided invaluable service to ASI and continue to be indispensable to ASI's further development. From the outset in 2007, the ASI strategic plan envisioned the eventual need for an ASI faculty advisory committee, and we agree that this is an opportune time to create this important academic counterpart to the external advisory board. As mentioned above, Professor Ermias Kebreab will be taking on the role of ASI deputy director in January 2014. Director Tomich will work with Professor Kebreab, in his capacity as ASI deputy director, and other ASI leaders to consider organizational models and options, with a plan to create an ASI faculty advisory committee by November 2014. Among other benefits, we share the review committee's view that expanding faculty involvement is one (of several) important roles for the ASI faculty advisory committee.*

To address the various financial needs, some general principles should be considered. Operational support should come from the state driven budget and from stable endowment income. Experiments should be supported by grants, perhaps with incentives to use ASI facilities. Major equipment and substantial facility upgrades should be supported by gifts and grants. All such ASI needs should be tabulated and discussed with the appropriate development officer/s to ensure that they are aware of the needs and uses of such gifts. Given time and energy, a campaign could be considered. The Student Farm should maintain contact with alumni in order to ask for their support when they become successful sustainable practitioners. *ASI comment: The review committee's clear statement of financial principles is useful as we endeavor to build a diverse portfolio of funding that suits ASI's many specific*

*functions. Indeed, we believe these principles fully align with ASI's current fundraising strategy and, in particular, point to the need to redouble our efforts to reach our $50 million target in ASI's endowment campaign. ASI currently benefits from approximately 0.3 FTE from a CA&ES development officer. In response to our long list of prospects and positive results generated so far, the CA&ES dean's office is recruiting an additional development officer, who will devote a majority of their attention to ASI development prospects. In addition to this gratifying recognition of ASI as a priority opportunity for CA&ES fundraising, ASI units and programs increasingly are viewed as campus-wide assets, which has opened opportunities to gain attention from "central" campus development. This is an important development over the past 12 months, since success in the ASI endowment campaign will require more than one gift of $10 million or more.*

The committee feels that the ASI mission is critical to the future of agriculture and that the current leaders and staff are providing excellent services to our missions of research, extension and teaching, doing so far beyond the call of duty. On behalf of the College, we thank them for this effort. With strongly engaged external constituency, the ASI now needs to broaden its impact within the College by involving more faculty. The challenges faced by ASI are driven by limited resources, expanding interest and a desire to serve broadly. At this point, the ASI should focus its efforts and plan for ways to expand its reach. *ASI comment: In closing, we wish to reiterate our gratitude to the review committee for this thoughtful report and the useful and timely suggestions it conveys. We agree that now is the time for ASI to expand engagement with faculty and we see clear benefits of pursuing that recommendation. Indeed, the great value the review committee has placed on our efforts so far is a reason for optimism that ASI can rapidly expand faculty involvement. And, as we strive to maintain a dynamic balance between growing resources (human, financial, and institutional) and exploding interest in our work, we feel there are good reasons for optimism that ASI can continue to grow and develop to full realization of its ambitious mission in sustainable agriculture and food systems for California and the world.*

ASI Review Committee, September 17, 2013

| | | |
|---|---|---|
| Lynn Epstein<br>Plant Pathology | James Oltjen<br>Animal Science | Ron Tjeerdema<br>Environmental Toxicology |
| Wes Wallender<br>Land, Air and Water Resources | Andrew Waterhouse, Chair<br>Viticulture and Enology | |