UMSAEP Report
Community of Practice around GM crops for small producers

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South Africa is the only country in Africa where genetically modified food crops (corn and soybeans) are legally produced but these crops are grown almost exclusively by very large scale commercial farmers. The purpose of the community of practice was to create a group of people including small black farmers, seed companies, government agencies and non-profit organizations to look at the potential of GM crops for improving food security and increasing incomes of small African farmers. The focus of this activity was in KwaZulu Natal and our primary partner was the Provinces farmers organization Kwanalu based in Pietermaritzburg. UMSAESP funds were used to link this particular project with South African institutions and to further develop relationships between CAFNR departments and South African research and higher Education institutions. Primary contacts were with the University of Pretoria, the University of Kwazulu Natal, the University of Western Cape and the multi-university Center of Excellence in Food Security.

The project carried out on farm experiments and farmer training for emerging low income farmers in three communities in Kwazulu Natal and linked small farmers, with researchers, agri-businesses, researchers, extension agencies and government ministries. This is one of the first of these types of efforts to occur in South Africa and was so successful that our South African collaborators have sought funds to continue meeting in the foreseeable future.

The conclusions of the project were that seed technology focusing on productivity was not the principal constraint to food security for small farmers in South Africa. Lack of available labor and problems with weeds were more important as were access to input markets and to national commodity markets. GM crops may be partial solutions to weed and labor problems but cannot solve the larger infrastructure problems. Attached as an annex is the final report to the Templeton Foundation.

Special Contribution of UMSAESP funds.

Year 1. At the beginning of the project Co-PI’s Gilles and Meyers travelled to Capetown, Durban, Pietermaritzburg and Pretoria to begin planning for the grant activities before the arrival of Templeton Foundation funds. This travel funds allowed us to begin the project in time to be ready for Fall rains and permitted us to form a collaborative relationship with Professor Jeremy Klaasen at the University of Western Cape and Marnus Gouse of the University of Pretoria. Without this timely injection of funds the work done by these two individuals could not have informed the design of field activities.
Year 2. At the end of the first year of field work, we held a meeting of stakeholders and small farmers in Pietermaritzburg, Kwazulu Natal. Funds were used to ensure the attendance of Dr. Willie Meyer and Kenneth Schneeberger at these meetings. They also use this time to develop deeper relationships with our South Africa University collaborators and to meet some emergency field research costs for the farmers.

Year 3. In August of 2014 a national level conference was held in Pietermaritzburg involving, extension workers, seed companies and researchers from partner universities and from provincial and national research services. Funds were used to cover travel of Drs. Willie Meyer, Ken Schneeberger and Chris Fulcher to this meeting as well as part of the expenses of Dr. David Berger, head of the division of plant sciences at the University of Pretoria. In addition to attending the meetings, Drs. Fulcher and Meyer were able to make presentations and meet with potential collaborators in Capetown and in Pretoria. They also met with representatives of the Ford Foundation, the Foreign Agricultural Service and other potential funders of collaboration with South Africa. These funds also helped to support the travel of an African science journalist, Adelaide Arthur to the meetings. She conducted television interviews of some of the participants which were shown on Ghanaian television.

In summary UMSAEP funds permitted the research program to get off to a quicker start—crucial in agricultural trials with narrow planning windows, and permitted a collaboration with a wider number of South African institutions than would have been otherwise possible. This was especially true of colleagues in Capetown and Pretoria. In addition the funds provided an opportunity for Drs. Jere Gilles and Chris Fulcher to have an opportunity to develop professional collaborations with South African scientists.
John Templeton Foundation Final Report Questions

Grant ID 29725
Project Leader William H. Meyers

1. Please list the expected results (Benchmarks of Success/Outputs/Outcomes) from your proposal. For each, provide a thorough, specific and candid description of what was accomplished during the life of your grant.

Outputs:
Output 1: Four workshops for the CoP
- Three workshops were held for non-farmer and farmer stakeholders, and approximately 4 trainings (workshops) per year were held with farmers providing them with maize production techniques and information. Attached in the appendix are agenda, list of participants, report summarizing activities and results.

Output 2: Two academic papers describing how CoP participants share their capacities and how this can contribute to the development of knowledge systems that enhance the adaptation of GM and non-GM crops by smallholders for smallholders in order to increase food security and create sustainable livelihoods.
- A paper was presented at the 2013 Annual Rural Sociological Society meeting in New York City, and one paper from the project was published in Agriculture and Human Values in Summer 2014. Additionally, an academic presentation was made at the International Consortium on Applied Bio-economy Research, June 18-20, 2014 in Nairobi, Kenya.
- We have included drafts and copies of papers and presentations in the appendix. In addition, these academic presentations are stored in the Community Commons.

Output 3: Three clusters of demonstration fields which include researcher and farmer managed fields.
- We deployed three demonstration sites working with four different groups of farmers. Demonstration sites included Hlanganani, Estcourt (2 groups) and Dannhauser. The location, area planted and names of participants are included in the appendix. Information about these sites is also included in the Community Commons.

Output 4: Literature review of smallholder experiences with GM crops in S. Africa and elsewhere that can be a resource to CoP members and others interested in the topic. Reviews will be written at a level appropriate for the target audiences.
- Marnus Gouse completed two reviews on GM crops in S. Africa that are available for review on the Community Commons as well as for public access. In addition Hester Vermuluen completed a review of consumer responses to GM, and it is also in Community Commons.

Output 5: Analysis of previous data gathered specific to the region with inclusion of socioeconomic impact of GM cotton and GM maize research since 2001 from M. Gouse.
- Marnus Gouse completed an analysis of his prior research on the socioeconomic impact of GM in KwaZulu-Natal, and the report is available on Community Commons.

Output 6: Analysis of maize samples from local markets to document existing presence of GM technology.
- Dr. Folks lab completed two analyses of maize samples from South Africa. The first confirmed the widespread presence of GM in commercially available maize meal, and the second explored the presence of mycotoxins in both GM and non-GM maize. Both reports are available on Community Commons and in our appendix.

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Output 7: Documentation of the barriers, opportunities and best practices for smallholder use of GM and non-GM crops generated by members of the CoP.
- We have included detailed reports for each cropping year outlining the challenges and successes of the CoP activities in the appendix.

Output 8: Two regional conferences on how to carry out action (CoP) research.
- We brought together farmer and non-farmer stakeholders in two conferences, July 2013 and August 2014. The program, list of participants and materials used are included in the appendix. Some PowerPoints from both conferences are available on Community Commons.

- The national conference was combined with the August 2014 conference. The program, list of participants, and materials used are in the appendix.

Output 10: Analysis of lessons learned about the potential of GM crops to address food security among smallholders in order to identify research, policy, other institutional gaps and/or other market failures impeding adoption of GM crops: which includes 1) At least two academic papers submitted to scholarly journals; 2) At least 8 policy briefs presented at the national conference and made accessible to stakeholders through the web; 3) Presentation at the national conference of a draft outline of a research and practice agenda that incorporates principles and ideas in the C of P that can be used by Kwanalu, S. African policymakers and others.
- We have included a copy of one of the published papers that appeared in Agriculture and Human Values in summer 2014. Additionally, the report commissioned from Erna Kruger about participatory research in S. Africa will be co-published with at least one of our team members but the paper has not yet been submitted. Our work turned more towards the documentation of the Community of Practice approach and we were not able to include as many policy-makers as we had originally hoped. Thus, the policy briefs were never completed. However, PowerPoints for the August 2014 conference are included in the appendix and provide some of the necessary policy attributes.
- A research and practice agenda was established through meaningful interaction with interested farmer and non-farmer stakeholders during the second day of the August 2014 conference.
- To document Lessons Learned by project participants, our KZN project leader, Roy Dandala, conducted personal interviews with the lead farmer at each of the three clusters and held group meetings for each cluster to which all participants were invited. His summary is attached and is available at our Community Commons website.

Outcomes
What will be different and which audience(s) will be affected?
What are the indicators of the difference? Quantify the changes that are likely to occur within and after the life of your project.

Outcome 1: Changes in Knowledge and Attitude (Short-term): 60 smallholders who participate in the community of practice can articulate how GM crops should be used, under which conditions and how successfully using GM crops will most benefit their livelihoods.
- Initial meetings with participating smallholders in each of the three clusters and planning for Year 1 demonstration plots proved that less than 20% of the participants understood the difference between open-pollinated, hybrid and hybrid/GM maize.
- More than 60 farmers learned the difference between hybrids, GM and open pollinated varieties. They also learned how to identify and apply herbicides, and identified weed management as their principal barriers.
• Transcripts from the two annual conferences held in KwaZulu-Natal have been preserved and are providing valuable information for papers under development that should be published in 2015. There is evidence some smallholders still do not completely understand the difference between a hybrid maize variety and a hybrid variety containing GM traits. Our 60 farmer participants are developing understandings of the benefits of GM crops, and have applied improved maize production techniques.

Outcome 2: Changes in Knowledge and Attitude (Short-term): South African and US researchers, including the eight project team members, involved in the Community of Practice can 1) describe the farmer capacities and agroecological and socio-economic conditions of smallholder production that either deter or encourage the use of GM technology, 2) articulate which current GM technologies are most likely to increase food security and secure sustainable livelihoods for smallholders, and 3) use this knowledge to inform current and future research on the full range of conventional and GM crop breeding and dissemination.

• From initial interviews with South African colleagues, meeting minutes, observations, conference proceedings, and discussion, it is clear that lack of markets for inputs and markets for production outside of neighborhoods is a severe constraint to increased maize production but GM technologies that save labor could be highly desirable. Thus the Roundup Ready trait may be more desirable than the Bt trait. Capital constraints and lack of credit make it difficult for people to acquire significant amounts of seed. Because of labor constraints, Roundup Ready maize may be more attractive than conventional hybrids despite the extra cost.

• Researchers and extension providers held a prior opinion that smallholders would not be interested in GM because of its cost and the availability of the seeds and other inputs. These stakeholders are surprised by the interest in GM from farmers who are very focused on increasing yields. However, there is acknowledgement that general best management practices for maize production is also very important for increasing yields.

• SA colleagues noted that the CoP approach we used – “learning together” – as something beneficial for both smallholders and non-farmer stakeholders to increase efficacy of projects. This will likely inform future research and development projects.

Outcome 3: Changes in Knowledge and Attitude (Short-term): 10-15 policymakers involved in the C of P can articulate the political and social barriers existing in South Africa to successfully using GM and non-GM crops to increase food security and secure sustainable livelihoods for smallholders.

• Stakeholders, especially provincial government workers, gained an increased appreciation of the market and labor constraints faced by farmers. We successfully involved 3 municipality administrators, 4 area extension leaders, 3 leaders at Cedara, the dean of agriculture at University of KZN, 2 non-profit leaders, and 3 staff from our U.S. Embassy in Pretoria.

• Outcome will be measured again with qualitative interviews during the last week of January 2015 with any policymakers who participated in the CoP model. This participation by policy-makers were fewer than planned because our work turned more towards the documentation of the Community of Practice approach. Nevertheless, they will be asked to describe changes in their understanding of GM crop technology and techniques, how GM technology will work best for smallholders to increase food security and income stability, and what kinds of policy changes in research and development, intellectual property regulations or economic incentives they will pursue based on the results of the CoP.

Outcome 4: Changes in Knowledge and Attitude (Short-term): 10 decision makers in private enterprises participating in the CoP can articulate how they can change their business models or practices to support smallholder adoption of GM crops in ways beneficial to food security and rural livelihoods while remaining profitable.

• 5 private sector participants were engaged in the process. The result was an increased level of marketing of Roundup Ready maize. So much so, that Monsanto sold more than they had expected and actually ran out of Roundup ready maize and had to substitute stacked varieties.

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• At least one stakeholder from private sector noted that the project helped his company look at the whole system of maize production by smallholders and they may have to make changes now because they understand better how these farmers think about GM crops.

• All smallholder participants learned about improved seed varieties available in the commercial sector and were connected to the commercial seed sector (Pannar and Monsanto) as a result of the project. Smallholders also developed better linkages to input markets.

• All project participants were introduced to Grain SA, the most progressive private sector agriculture company serving small and medium-size farmers. Grain SA was unknown to project participants prior to this project and has now gained membership through the project.

Outcome 5: A shared understanding among the participants in the project of the ecological, social and economic aspects of food security in Kwa-Zulu Natal.

• Conferences produced a shared understanding of the limitations that emerging farmers face in terms of access to markets, inputs, information and credit. This is incredibly important to future work in the area, and ideas and concepts gained through the CoP are already being applied by Kwanlu and other organizations.

Outcome 6: Changes in Behavior (Intermediate Outcomes): Smallholders, researchers, policymakers and others involved in the CoP will establish relationships during the project period that we expect to continue and grow after the project ends. Possible indicators of this outcome would be 1) continued collaboration of members of CoP, 2) adoption of CoP approaches elsewhere in South Africa and 3) continued use of best practices identified by CoP by small holders.

• In discussions with some of our stakeholders especially LIMA, the rural development NGO, they decided that the Community of Practice idea was so valuable that they were going to continue it using local funds. However, they will not be able to include Missouri participation with South African funds.

• Some of the ideas developed through the CoP have been incorporated into the successful project proposal for the Center of Excellence on Food Security, which is co-directed by University of Western Cape and University of Pretoria and where University of Missouri is an active partner. There will continue to be collaboration through this project.

Outcome 7: Changes in Conditions (Long-term Outcome): Changes in the institutional environment (regulatory changes, economic incentives, extension support) resulting from the CoP.

• Long term changes in the institutional environment were not noted due to the limited length of the project. However, the new Provincial Minister of Agriculture attended our final conference and seems interested in the process. There was a general acknowledgement that the Community of Practice Approach worked well for technologies such as GM crops.

• Additionally, Dave Berger, a plant science researcher from the University of Pretoria, has developed relationships with one of our smallholder groups through Kwanlu and is including them in his research on plant virus. This provides some sustainability to this relationship.

High Impact Conference in Washington DC

Culminating Conference
The project team decided the greatest domestic impact from our project would be accomplished with a one-day conference in Washington, DC. Our goal was to host a “knowledge summit” on best practices for ensuring smallholder engagement in projects designed for their benefit. We were fortunate to attract the Center for Strategic and International Studies as a co-host and the conference was held in their excellent Washington, DC headquarters.
The conference title was: From the Ground Up: Translational Research Pathways to Improves Lives of Smallholders. We attracted leading experts from the Gates Foundation, USAID, USDA, the CGIAR system, major universities and NGOs. These thought-leaders addressed the challenges, achievements and impacts of successfully engaging smallholders and related stakeholders in projects that sustainably improve smallholder livelihoods and food security. Participants left with a clear appreciation for the merits of using the Community of Practice model and concrete ideas for more effectively conducting projects that have high potential for long-term impact.

Videos and PowerPoints of the presentations were captured and are available at http://csis.org/event/ground-translational-research-pathways-improve-lives-smallholder-farmers A summary document is in process.

We are grateful to the Templeton Foundation and the Mizzou Advantage interdisciplinary program at the University of Missouri for funding the conference. Valuable exchanges of knowledge and new connections among practitioners and funders with mutual interest were achieved. A list of attendees is attached.

Note: Please attach electronic copies of relevant materials you developed during the life of this project (see page 2). In addition please include electronic copies of any materials produced by others that demonstrate the accomplishments of this grant.

2. If applicable, please list any unanticipated results related to your grant. For each, provide a thorough, specific and candid description of what was accomplished during the life of your grant.

- On the last day before departing from Pietermaritzburg after the final conference in August, the co-PI, Jere Gilles met with one of our principal project supporters and advisors who is head of a large NGO called LIMA. The surprising revelation from him was that our project renewed close cooperation between him and the CEO of our partner organization KWANALU which had languished in previous years. From this cooperation, they had decided to jointly fund a rural development officer to be located within Kwanalu. This cooperation is, in fact, a large benefit for all concerned and was entirely unexpected. So the smallholder Community of Practice fostered a closer bond among the organizations in the best position to follow up on our project.

- As mentioned in Outcome 2, the smallholders and especially the women were nearly unanimous in their strong interest in the herbicide tolerant trait because of the labor saving effects. Our team feels this interest provides an opportunity for follow-up with women in smallholder households to leverage this changed behavior through a broader C of P that engages women in alternative (to weeding) efforts and activities that enhance the health and nutrition of the household. This could be educational and/or income generating activities that open new sources of information and new access to recourses to improve their livelihoods.

3. Describe how your grant has or has not made progress towards achieving your vision of Enduring Impact specified in your proposal. Looking to the future, what is your perspective on the work that remains to be done to realize your original vision?

- There is progress in the fact that the participants are seeking local funding to continue the community of practice. If this funding is obtained we will have created a group of persons and institutions that meet to deal with small farm development issues in South Africa. Moreover, the communication and cooperation between LIMA and Kwanalu will contribute to increased food security through their planned rural development efforts. Finally, our participation in the Center of Excellence in Food Security project will continue to have impact for these smallholders.

4. What were the most important lessons learned during the course of your grant?
• Lack of scale appropriate institutions to provide inputs, markets and credit to small farmers may be an even greater challenge in South Africa than elsewhere in Sub-Saharan Africa for any kind of improved agricultural production, whether GM is used or not. For instance, it is striking that challenges and obstacles faced by non-profits seeking to increase farm-to-table production for restaurants recite almost the same challenges as we do for farmers to access inputs and markets for the maize generated from their increased productivity.

• That GM technology greatest potential for helping to increase food security in South Africa is in its ability to reduce labor requirements for weeding. However, this might not be applicable in other contexts in sub-Saharan Africa.

• That the community of practice approach seems to be extremely well suited for developing approaches to the use of previously untried/unknown technologies. This “lesson” was also the key finding from the DC conference.

5. Are there areas where the John Templeton Foundation could improve its grantmaking process?

We were pleased with the availability of your staff to answer questions and they were always prompt and considerate. We are somewhat surprised by the large time gap between the end of the project and the submission of the final report. But we try to come as close as possible to that goal.

6. Please consult your most recent Grant Agreement and address any additional Final Report Requirements such as a Cost Effectiveness Statement.

7. To the best of your knowledge, is the Project Leader or Project Co-Leader a JTF Trustee, Officer or staff member or related to a JTF Trustee, Officer or staff member as a spouse, sibling, child, or parent?

   ___ Yes
   ___x__ No
Attachments

Please attach electronic copies of materials you have not previously submitted (see page 2). In addition please include electronic copies of any materials produced by others that demonstrate the accomplishments of this grant. Examples include:

- Research findings. Brief description of your key research findings and your assessment of their significance.
- Copies of publications or works in progress.
- Book manuscripts
- Event/Conference agenda, list of speakers, and proceedings
- Curricula, including reviewer/user comments if available
- Classroom/Training dates, attendance and results if available
- Electronic media
- Website URLs and summary user statistics if available
- Prizes/Competitions/RFP’s: applicant and winner lists with project abstracts
- Notable media coverage with links or copies