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AGRICULTURE TECHNOLOGY PROGRAM (AgTech)

ANNUAL REPORT III

(OCTOBER 2012 – SEPTEMBER 2013)



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The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

ACRONYMS

AI	Artificial Insemination
GOT	Government of Turkmenistan
HH	Household
IPM	Integrated Pest Management
LN	Liquid Nitrogen
LNG	Liquid Nitrogen Generator
LOI	Letter of Invitation
MFA	Ministry of Foreign Affairs
PMEP	Project Monitoring & Evaluation Plan
SLU	State Livestock Union
TOT	Training of Trainers
USG	United States Government

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OVERVIEW OF ACCOMPLISHMENTS FOR YEAR 3

This report summarizes the work conducted by Weidemann Associates, Inc., A Crown Agents USA Company, in implementing the Agriculture Technology Program (AgTech) for Turkmenistan during the period of October 2012 through September 2013. Overall, the foundation set during the first two years of the project has fostered continued growth in crop and livestock production, which resulted in a project ceiling increase of \$1.24 million and a task order contract extension through February 2015.

The first quarter of Year 3 was marked by the grand openings for two artificial insemination (AI) centers in Ahal and Dashoguz for livestock breeding and training purposes, the USAID/Chevron co-sponsored training of heat detection and other bovine breeding best practices, the start of drip irrigation seminars for greenhouse farming, and the first joint activity between Turkmenmallyary – reorganized in early 2013 as the State Livestock Union (SLU) – and AgTech, in which the project trained 10 Turkmen government veterinarians on how to conduct bovine artificial insemination.



Project highlights from the second quarter include the technical start of liquid nitrogen (LN) production and supply to regional AI specialists across the country, facilitation of the granting of an import license to the Ahal AI Center manager, and a seminar for the project horticulture partners and seed providers, during which participants discussed the current market situation regarding greenhouse vegetable production and Turkmen regulations on seed imports and sales within the country. Our Ahal AI Center partner, Mr. Nepes Karayev, is only the second Turkmen national in the country with an import license for livestock breeding products, which enables the AI Center in Ahal to import frozen bull semen and other related livestock breeding supplies and sell them within the country. Despite these successes, it is noteworthy that in Q2 the AgTech project conducted fewer activities compared to Q1 due to significant delays in approval of submitted project plan of activities by relevant authorities, including the Ministry of Foreign Affairs. However, this impacted only those activities that involved gathering people for seminars in the regions, primarily within the horticulture component.

In Q2 the AgTech project saw positive signs for sustainability of its activities in the form of increased government support for AI activities related to improving the genetics of local cattle breeds. At the end of January 2013, the most widely read newspaper, *Neutral Turkmenistan*,

published an article in which the newly formed State Livestock Union (SLU), a successor of the former State Livestock Association, Turkmenmally, revealed its plans for improving the livestock sector. The core of this plan, according to the article, is the creation of AI Centers in each region of the country and a livestock breeding center in the Ahal region. This new state initiative mirrors the efforts of USAID in Turkmenistan regarding livestock development. The emergence of the national interest in developing AI services indirectly resulting from AgTech activities over the past few years suggests potential increases in GOT public funding for this work and will enable AI to continue and develop in the country for many years to come. Seeking technical assistance, the representatives of SLU have already approached AgTech project specialists and proposed combining efforts to work together in the Ahal region.

Despite significant delays in receiving approvals from the Ministry of Foreign Affairs (MFA), AgTech was able to successfully carry out a business-to-business (B2B) trip to Ukraine for AgTech project's horticulture partners and producers in Q3. Other project highlights from the third quarter include AgTech participation in two government-organized conferences, organization of a greenhouse production competition, and the publication and dissemination of two field-guide handbooks on greenhouse horticulture production among horticulture farmers in all five velayats.

During Q4, AgTech revised its quarterly activity plan in another attempt to receive an official approval from the MFA for project activities. By the end of the quarter, AgTech managed to meet or exceed PMEP annual targets in five of its nine indicators. Cumulatively, the project is on schedule to complete its deliverables aside from the delayed training activities. With the support from our private sector partner, Chevron, the project is increasing the capacity for veterinarians and farmers to transform the dairy industry in Turkmenistan and support the high local demand for meat and dairy products.

The Project seeks to focus on training extension services and business development in Year 4 and 5, in order to ensure market linkages for bolstering growth in production. Extension services and business development activities will ultimately increase farmer incomes, production capacity and provide adequate food security for the region.

The contract's ceiling price has risen to \$4,672,280 with the additional ceiling increase of \$1,240,000 and Chevron gift funds in September, 2013. As of September 30, 2013 the project estimates that \$2,506,129.65 has been spent of the obligated \$4,074,491 funds.

PMP TARGETS AND DEVIATIONS:

Performance Indicator	Performance Indicator Definition	Year 3 Proposed	Year 3 Actual (through fourth quarter)	Project Total
50% increase in HH income	<i>Horticulture HHs and farms increasing income by 50%</i>	1000	471	787
	<i>Livestock HHs and farms increasing their income by 50%</i>	1000	N/A	N/A
Person hours of training completed in private sector productive capacity supported by USG assistance	<i>Number of hours of training completed by beneficiaries and training participants, disaggregated by gender</i>	3000	1668	1869
Farmers, processors and others who have adopted new technologies or management practices	<i>Number of beneficiaries and training participants using new technologies or practices as introduced by the project, disaggregated by gender and region</i>	500	1417	3340
Quantity of produce grown and/or sold	<i>Farmers, buyers or labs are using AI, improved feed, vet services, greenhouses, drip irrigation, grading, post-harvest packaging practices training</i>	Baseline + 150 %	Baseline + 151%	Baseline + 151%
Value of produce sold to local and international markets	<i>USD value of goods in livestock and horticulture sector disaggregated by product and veleyat</i>	Baseline + 40%	Baseline + 107%	Baseline + 107%
Number of agriculture-related firms benefiting directly from USG supported interventions.	<i>Number of input providers and buyers strengthened to provide farmers with necessary inputs.</i>	150	19	90
Number of greenhouses constructed or improved	<i>Number greenhouses constructed and/or renovated in each veleyat</i>	100	100	294
Land under improved technologies or management practices	<i>Indicates the number of ha under greenhouse or livestock project activities (existing and new land).</i>	500	20	28

A full description of the PMEP results by indicator is attached as an annex to this report. The project has done well to exceed or stay within targets for most indicators with the exception of “50% increase in HH income”, “Person hours of training completed”, “Number of agriculture-related firms benefiting”, and “Land under improved technologies or management practices.” As the new calves mature, the project will follow them for information on their milking rate, but this may not be available until Year 4 as a cow typically delivers her first calf when she is about two years old. The land tenure laws of Turkmenistan continue to restrict what the project can do to expand the amount of land under better technology and agricultural practices.

PROJECT ACTIVITIES AND OBJECTIVES

AgTech designed activities throughout the last three years to target USAID's overall objectives of increasing agricultural productivity and farmer incomes. The activities included transferring technology and information to the local input providers, farmers, and households, all in support of strengthening the horticulture and livestock sectors.

Horticulture component results have been generally strong, despite the multitude of challenges faced in the velayats. Overall, cucumber and tomato production has increased 151% over the baseline figures and the value of those goods has increased by 107%, showing that despite availability of imported varieties, market preferences for local produce remains strong and demand has not yet been satisfied.

Livestock component activities have expanded to regional TOT trainings and AI extension services at the farm and household level, increasing the number of beneficiary farmers. The results have ignited greater demand for improved genetic material and AI services. As Year 3 ends, optimism abounds regarding the soon-to-be-born calves which represent a second generation of Brown Swiss and Holstein bred cattle.

With the corps of more than 55 project-trained AI technicians, the project has directly supported over 1,500 successful artificial inseminations throughout the country. The new generation of calves born out of AgTech AI training activities has been captured on media, and marketing efforts supported by the project have helped increase the demand for world class genetic material among local farmers and larger commercial farms. The world class genetic material is now in high demand.

Aside from the Brown Swiss and Holstein breeds, AgTech introduced Jersey's genetic material to Turkmenistan this summer due to the breed's high level of adaptability and efficient milk production capabilities (i.e., less food intake for optimal dairy output). Recognizing the demand for beef in the country and also that profitability among farmers is greater for beef, AgTech imported Limousine genetics as well. To accelerate local milk production from the new cattle, AgTech procured and distributed female sexed semen on a cost-sharing basis to project participants, through local entrepreneur and project partner, Mr. Nepes Karayev.

Next Steps:

The Project will expand its activities of greenhouse extension services via greenhouse demonstrations in Ahal.

In Year 4, the Project will procure additional dairy sexed semen and introduce the Montbeliard breed for beef cattle development.

Livestock nutrition and feed formulation development in collaboration with farm-based feed producers.

Based on pilot activities in Year 1 and Year 2, AgTech has shown a correlation between milk production and feed and herd management techniques. AgTech continues to closely examine activities for improving animal feed production to support healthier, more productive herds. Looking forward, the project intends to complete a feed formulation, procure feed milling technology, conduct herd management trainings, and continue to create, produce and disseminate booklets and multimedia of various subject matters. We continue to push forward for increased accessibility to training and advertising tools to promote best practices and celebrate the project's widespread impact.



*(Distribution of project training booklets by Project Greenhouse partner)
Photo by: Zulya Achilova*

HORTICULTURE COMPONENT

Greenhouse Reconstruction

In the project's first year, 70 greenhouses were either built or renovated to the specifications highlighted during project seminars. The main goal was to affordably create a more productive environment given the same small plot of land. During Year 2, an additional 124 greenhouses were built or improved. Year 3 saw an additional 100 greenhouse constructions and renovations bringing the project's cumulative total to 294.

Through greenhouse improvements, AgTech helps small holders maximize income with least cost investments. The affordability of these small changes has enabled farmers to reinvest in their business, thus many beneficiary farmers are now building subsequent greenhouses or expanding the size of their plots where possible.

A Greenhouse Built in Balkan



Orazgyljow Durdy
Pomidor- 1,500kg
uzynlygy-12m ini-6m

In Year 2 AgTech leveraged USAID's investments to build demonstration greenhouses in Balkan and Dashoguz to complete the objective of having a demonstration greenhouse in all five velayats. The demonstration greenhouse built in the Balkan was the first in that region of the country. As of the end of Year 3, there are now eight greenhouses in the Balkan region. The additional greenhouses built in Balkan and their impact is 100% attributable to USAID funding.

CHALLENGES:

- Only four more greenhouses have been built this year in Balkan despite efforts to jump start the horticulture sector in the western part of Turkmenistan. One factor for this was family health issues of AgTech’s Balkan partner. This slowed the introduction of greenhouse practices to interested prospective greenhouse farmers, and production results were limited accordingly.
- There are no construction materials readily available near the Balkan demonstration greenhouse, which makes building new greenhouses more complex logistically.
- Aside from the Balkan, the project has hit a critical mass in the number of new greenhouses being built around the immediate areas where the demonstration greenhouses are located in respective velayats.

SUCSESSES:

- Greenhouse designs that include higher roofs have effectively increased production on average by 151% without creating any negative environmental impact.
- Following the very first greenhouse built with USAID support in the Serdar region of the Balkan, there are now eight greenhouses in total producing high value local products.

Horticulture Training

AgTech’s horticulture training sessions focusing on greenhouse management of soil preparation and plant protection were delayed throughout the year due to the absence of GoT approvals through the MFA for these activities. The previously on-going project training sessions were designed to provide access to technological practices that lead to increased yields. Nevertheless, project monitoring and evaluation of activities has shown that progress continues even in the wake of delayed interventions and support from the project. The farmers are collectively reporting increases in production that are 151% greater than the start of the project three years ago, and the value of tomatoes and cucumbers have grown by 107%, an indication of how profitable greenhouse activities can be for small holders.



*(Soil Testing Activity)
Photo by: Zulya Achilova*

The Program’s objective for the horticulture component trainings has been to deliver knowledge and introduce new technology and practices by supporting lead trainers and farmers in their respective velayats. Looking ahead to Year 4, AgTech is modifying its strategy to conduct more extension services for farmers who can then

lead the dissemination of best practice information independently within their respective communities to generate a wider impact than farmer-to-farmer training alone, which we believe will also result in greater sustainability of best practices.



AgTech Project Manager with a Greenhouse Competition winner

Photo by: Zulya Achilova

As part of its annual work plan activities and to encourage farmers to incorporate best practices, AgTech organized a greenhouse producers' competition among horticulture farmers who participated in training seminars since the project's inception. Winners were chosen based on yield, plant health, as well as the products' presentation from each province.

Project specialists formulated competition criteria in collaboration with project horticulture farmers. Criteria included such aspects of production as the yield per 100m², use of best practices in production, percent of diseased crops, and minimum use of pesticides. Winners from each region have been chosen by the project specialists and regional partners based on regular monitoring of production results and benchmarks set within the region. AgTech has provided each winner with personal protection equipment (PPE), including backpack sprayer, rubber overalls, respirators, gloves and non-slip shoe covers to encourage and promote best environmental practices. The project is confident that such an event highlights the importance of health and safety in effective management of greenhouse production for maximizing the value of best practices in pesticide utilization.

CHALLENGES:

- Significant delays regarding MFA approvals of project activity plans. These delays impacted the project's ability to implement its planned activities in Year 3. Despite attempts to revise activity plans, the project appears to have little control over the situation. Consequently, AgTech has excluded training seminars in Year 4 & 5 from its work plan. Based on the gathered information from the field, seminars and other gatherings in the villages are scrutinized by the government. The government position on village congregations is one of the main reasons for the lack of approvals. For instance, the project had to postpone indefinitely planned velayat training seminars on the use drip irrigation in greenhouses for February and March.

SUCSESSES:

- 151% increase in production and a 107% increase in income among participating farmers.
- Instead of seminars, such as in the case of the drip irrigation event, AgTech planned for agriculture extension activities in Year 4 and 5, and conducted a round table meeting for

horticulture partners and seed providers in the Ashgabat project office as an alternative activity agreed upon with USAID's approval.

Study Tour/Business to Business (B2B) trip to Ukraine

AgTech sent a small group of four Turkmen horticulture project partners and seedling producers on a weeklong study tour with the Ukrainian branch of the Dutch seed producer, Rijk Zwaan. Rijk Zwaan covered all local expenses, including lodging, while the project covered airfare and daily per diem (i.e., M&IE).



B2B participants with a Rijk Zwaan representative

Photo by: Zulya Achilova

The visit included trips to seed trial sites in Kiev, agricultural shops and laboratories, horticulture farms and agriculture firms in Crimea, trans-Carpathian and Kherson regions. The group was immersed in various informational meetings and discussions on horticultural production as well as best practices in greenhouse construction, management, using effective techniques and an informational session on commercial and legal importation opportunities.

Participants were exposed to best practices in greenhouse construction and management as well as effective production methods and growing techniques for different vegetables (e.g., cabbages, peppers, onions, tomatoes and cucumbers) as cash crops intended to maximize farmers' income levels. The trip established business linkages between local growers and foreign suppliers. AgTech envisions these relationships improving the underdeveloped input supply of the horticulture market in Turkmenistan. For example, one of the participants, Mr. Charymyrat Orazgeldiyev, purchased tomato seed varieties from the Rijk Zwaan that he tested before. According to Mr. Charymyrat Orazgeldiyev, these tomato varieties have shown great resistance to popular local plant diseases, they are uniform in shape, and they have a great marketability potential. Mr. Charymyrat Orazgeldiyev, a local seedling producer from Ahal, produces up to 200,000 seedlings a year and sells them in the areas around Akdashayat village.

CHALLENGES:

- Licensing and import/export regulations make it difficult to establish official trade relationships.
- Seed registration in Turkmenistan is a lengthy process, which creates a barrier to legal trade with input suppliers.

- Disseminating the information learned to a larger group of farmers is challenging in the current environment (i.e., lack of GoT approvals) that restricts field training in the velayats.

SUCSESSES:

- The trip facilitated the establishment of business linkages between local growers and foreign supplier companies, which can act as a catalyst to improving the underdeveloped input supply for the horticulture market in Turkmenistan.
- Greater understanding of best practices by the participants and the internal constraints between regions of Turkmenistan that restrict farmers from exporting their produce to regional and international buyers.

LIVESTOCK COMPONENT

AI Centers and Technology Transfer

AgTech opened two AI Centers in Dashoguz and Ahal provinces in Year 3. To celebrate the Ahal AI Center opening, a large PR event was held involving the local newspaper and TV station. Attendees included the US Ambassador to Turkmenistan, Robert E. Patterson, Chevron representatives, USAID and “Turkmenmallary” (now SLU) representatives.

AgTech continues to provide incentives for encouraging improvement of animal hygiene and nutritional intake through a private entrepreneurial business model. The model ensures that training veterinarians have an opportunity to work with local partners as extension agents, which helps improve the quality of dairy cows and their milk production throughout Turkmenistan.

On March 28, Mr. David Westerling, Deputy Director for USAID’s Economic Development Office, visited Turkmenistan and toured the Ahal AI Center. AgTech’s lead AI trainer, Ms. Katya Chichnayeva, gave an on-the-farm demonstration conducting artificial insemination using project-procured equipment. He also visited the USAID and Chevron co-funded liquid nitrogen generator and saw it in its operational state.

CHALLENGES:

- Delays in official transfer of the LN Generator to the Central Laboratory of the State Veterinary Service. The challenge is related to a lack of government approval. As an alternative option, AgTech is planning to transfer the LN Generator to a private recipient/livestock farmer.

SUCSESSES:

- Procurement of frozen bull semen, which for the first time was paid by AI project specialists at a wholesale price.
- Procurement and introduction of new breeds of cattle including Jersey, Limousin (beef

breed) and female sexed semen for Holstein and Brown Swiss breeds. The sexed semen is intended to increase the number of female calves to accelerate impact on milk production and diversification of the genetic pool. This procurement was made via the Ahal AI Center manager, and he shared the cost for 2,000 of the 6,000 doses of bull semen procured.

- Procurement and installation of LN generator with Chevron funds. The installation of the LN generator provided a steady access and supply of LN to project-trained AI specialists across the country.

AI Trainings in the velayats

AgTech has continued conducting AI trainings throughout the five regions in Turkmenistan. With the financial support of Chevron, the project hired the CEO of Veterinarians Without Border, Dr. Thomas Graham, to conduct a two-week training program from November 14-30 with a group of the most promising Turkmen AI specialists. This training was designed to help farmers and veterinarians incorporate best practices in heat detection and increase the AI technicians' pregnancy detection skills using a combination of palpation and hand-held ultrasound equipment. The scope for the training was expanded to include not only reproduction, but also nutrition, calving assistance, young stock growth, physical examination, disease diagnostic methods, medical treatment, vaccination protocols, hoof trimming, and building/housing design recommendations. The goal is to lower the days needed to detect pregnancies from 90 days to 45 days. By doing so, farmers will realize a significant increase in farm productivity and breeding efficiency, which can ultimately result in more milk and meat production. Simultaneously, AI specialists with advanced heat detection and palpation skills will improve their success rates for conducting AI, strengthening the ability for AI technicians to have prosperous careers.

These training activities utilized the new AI Center in Ahal for theoretical training and classroom instruction, while Mr. Nepes Karaev's farm adjacent to the AI Center provided the cows necessary to conduct the hands on portion of the training. 13 AI technicians participated over the 14-day training period. Although the number of participants was smaller than desired, Dr. Graham preferred a smaller group for training

“These veterinarians are presently doing an excellent job of estrus detection and artificial insemination, but many cows do not express heat because of unbalanced rations or because there are only one or a few cows on the farm making the detection of estrus more difficult...”

- Dr. Thomas Graham, President, Veterinarians Without Borders

Next Steps:

Import 7,000 additional doses of genetic material from new breeds.

Organize a series of training trips for project AI trainers to a US commercial dairy farm.

The trainers will primarily receive training on heat detection and herd management and increase their pregnancy detection skills.

purposes due to the difficulties in working with large groups for hands-on training. During the training, thirty (30) cows were determined to be open, of which many were pregnant and the others were anestrus (i.e., not cycling properly). The three cows that were open and ready were inseminated during the training. In recalling the AI skills of the technicians, Dr. Graham observed, “These veterinarians are presently doing an excellent job of estrus detection and artificial insemination, but many cows do not express heat because of unbalanced rations or because there are only one or a few cows on the farm making the detection of estrus more difficult. Additionally, 40% of cows express estrus poorly, making the task even more challenging for even those with excellent heat detection skills.”

Among the highlights of the training was the use of a hand-held ultrasound tool to support the palpation of cows to determine pregnancies in the herd. Dr. Graham has indicated that this will take a good deal of time and practice.

Additionally, in partnership between the AgTech project and the State Livestock Association (Turkmenmally) to conduct an AI training seminar for 10 Turkmenmally veterinarians on December 17-28. This training is the first of its kind in the livestock sector. USAID funds are being used to increase the technical capabilities of the state technicians. This type of collaboration is paving the way for increased government support. Specifically, Mr. Orazmuhammet Annageldiyev, the Deputy Chairman of Turkmenmally, and Mr. Atajan Cherkeзов, a chief scientist from the National Livestock research Institute, both shared their appreciation for this type of cooperation to restore and improve the livestock sector in Turkmenistan. Mr. Cherkeзов went as far as writing an article on this event for Taze Oba magazine, which was published in the August 2013 edition.

Furthermore, Chevron as well As USAID representatives paid AgTech a visit and praised the continuing training efforts conducted by the project staff and specialists, despite the difficult environment.

CHALLENGES:

- Obtaining licenses for AI specialists to conduct AI activities and to import genetic material. This policy-related challenge is connected to the internal reorganization of “Turkmenmally” livestock association that took place in early 2014. This challenge is also outside of the AgTech project’s control. Instead, the project is leveraging its expert's personal contacts to gain more control and support for new licenses among those working with the AI centers.
- Input costs for cattle feed production remain high, limiting profitability for potential investors. This challenge is partially due to a lack of access to an adequately arable land for growing forage crops, raising the cost of key feed inputs.

SUCSESSES:

- With AgTech’s support, Mr. Nepes Karayev, an Ahal AI Center’s Manager, was able to receive a license. Mr. Karayev is now the second person in the private sector to receive a license for importing and trading AI related goods in the country.

- AI Training of 10 specialists who work for Turkmenmallery, a first project activity held in direct collaboration with the GoT.
- Conducting a ToT on heat detection led by international livestock consultant, Dr. Thomas Graham.

PROGRAM DEVELOPMENT AND SUPPLEMENTARY ACTIVITIES

Support to USDA Cochran Fellowship Program

AgTech assisted eleven (11) of its partners and beneficiaries with correctly completing their application to the Cochran Fellowship program as well as professional references. The Fellowship Program is known to provide superior training to participants in order to help improve their local agricultural systems and boost market linkages with the United States. Participants are selected from a pool of public and private sector professionals concerned with agricultural trade and business development, as well as management, policy, and marketing.

The interview and selection process was carried out by the USDA and US Embassy representatives in Ashgabat. AgTech project did not take part in this, nor did the project participate in the selection. However, AgTech assisted the US Embassy in Ashgabat with scheduling the interviews.

Out of the eleven (11) candidates only two (2) candidates passed the interview process and were selected to participate in the program. Ms Arzygul Ovezliyeva of the US Embassy in Ashgabat, informed AgTech's COP about finalists of the program. The selected candidates were Mr. Merdan Garayev from Lebap region and Mr. Gayrat Khudayshukurov from Dashoguz region. The former winner is a recipient of project AI services in Lebap, with a strong livestock and veterinarian educational background. The latter candidate represents the AgTech's second generation of AI specialists and directly involved in AgTech project activities.

The Cochran training program is scheduled to take place in early 2014 (around February) and would be an ideal supplemental support to the AgTech planned US-based a month-long training for 4 AI specialists.

Conferences and PR Events

AgTech represented USAID/Turkmenistan in the International Scientific Conference, "Science and Innovative Technologies" in Ashgabat in June. High profile government officials, members of Cabinet of Ministers and state agency representatives were among the attendees. AgTech demonstrated and promoted its activities to a large audience, including government officials and business entities.

Mr. Charles Yesolitis, AgTech's project manager, and Dr. Thomas Graham, CEO of Veterinarians Without Borders, represented the project at the US Embassy sponsored US –Turkmenistan Business Forum in early May 2013. Dr. Graham presented on animal nutrition and health issues, with special emphasis on the accomplishments of the AgTech Project and potential

improvements in animal feed. The forum provided an opportunity for the project and USAID/Turkmenistan to demonstrate and promote its activities to a large audience of government officials and participating international companies.

Training Database Development

The project has developed M&E tools to collect information from training participants. This serves as the foundation for development of a database to use to report on key PMEP indicators and other baseline information that may be useful to USAID. In order to maximize resources, the project is training the trainers on the data collection processes and may use other human resources where available to save on time and local travel expenses for the project managers.

Due to the remote and sparse location of many livestock households, documenting all newborn calves remains one of the main challenges. Another major challenge is poor records, if any, by farmers to record increases in milk yields and income as a result of increased use of AI services and improved breeds.

Storage and Transport for AI

Better quality Dewar flasks are necessary for storing and transporting Semen, to ensure safe and effective transportation of LN to the neighboring velayats. Current flasks have a capacity to store semen for less than one month, requiring a refill of nitrogen 1-2 times a month, which puts a strain on the distribution chain for liquid nitrogen in and around the velayats. 10L and 50 L Dewars have been identified and procured for project purposes.

Construction of AI Service Center

The AI Training Service Centers in Dashoguz and Ahal provinces are acting as research and training facilities for AI practitioners. A memorandum of understanding (MoU) has been signed between Nepes Karayev and Weidemann Associates, Inc., A Crown Agents USA Company.

COMPLIANCE WITH SECTION “IMPLEMENTATION PRINCIPLES AND KEY ISSUES”

Anti-Corruption

As has been previously reported, importing equipment and materials into Turkmenistan requires many licenses and paperwork to move goods through customs successfully in a cost-effective manner. The project is working to outline the process of importing agricultural input products so that current and future entrepreneurs and farmers in Turkmenistan will have a guide by which to operate within the law. The project’s focus will not be on making any policy changes, but rather helping the local population and businesses adapt to the laws that govern in order that they may operate more efficiently and in a sustainable way.

Capacity Building of Local Staff and Sustainability

The local staff of the AgTech project is all new to USAID donor project work aside from Mr. Murad Nabotov, who previously worked with Winrock International in Turkmenistan. In Year 3, home office project administrative support has worked with the team to ensure compliance with USAID and FAR rules, requirements and procedures. AgTech has planned to hire and train new staff in Year 4 in order to support the increased project activity expected from the additional \$1.24 million funding provided to the project.

As mentioned in previous reports, sustainability of AgTech activities in Turkmenistan will only occur through a transfer of tangible goods, skills and knowledge that can allow for AI services, livestock development and greenhouse production to continue to improve for years to come. By procuring high-tech inputs and capital goods for the AI infrastructure and using a lead farmer model, the project has set a solid foundation for local farmers, veterinarians and businessmen to replicate project activities to continue economic growth in Turkmenistan's agriculture sector.

Environmental Compliance Requirements

AgTech's Pesticide Evaluation Review and Safe Use Action Plan (PERSUAP) was submitted and approved in Year 2. Despite the insufficient and missing data, the project staff has been able to gather information necessary for completing the PERSUAP. The ER Checklist was used in conjunction with the Leopold Matrix by the Agreement/Cognizant Technical Officer (AOTR/COTR) to determine that the proposed Liquid Nitrogen Generator poses low environmental concern. The checklist will determine the scope and extent of additional environmental evaluation, mitigation, and monitoring necessary to fulfill federal U.S. environmental requirements.

As part of its horticulture component, AgTech is also planning to procure and disseminate additional personal protection equipment (PPE) for farmers when using pesticides. Additionally, in Year 4 a pocket field guide with a list of permitted pesticides referred to in the PERSUAP will be produced and disseminated to greenhouse farmers.

Food Security

Although food security is not a major focus for this agricultural project, the Balkan region in particular is susceptible to price shocks as this is the one region that has no greenhouse horticulture. Prices for fresh produce are always higher in this region, and the rural population has a lower level of income. The project conducted a study tour to Ukrainian to visit a Dutch seed supplier, "Rijk Zwaan" for project horticulture partners. The trip provided opportunities to exchange ideas and discuss various topics, including best agronomic techniques, seed selection, plant protection and input supply possibilities to Turkmenistan.

Gender and Youth

As observed through the last three years of project activities, many of the farmers are men; however, women and children often help in planting and harvesting the crops, as well as milking and looking after the cattle. Without a formal training program, inclusion of more

female beneficiaries becomes a challenge, although we plan on making this a priority for the extension training in Year 4.

SUMMARY OF STAFFING MATTERS

No significant staff changes have occurred since August 2012. However, with the additional funding received in Q4 and the increased level of work plan activity anticipated in Years 4-5, AgTech is seeking to hire an additional agricultural technical specialist and another person for project administrative support.

CHEVRON FUNDED ACTIVITIES

In September 2013, the USAID Agriculture Technology Program in Turkmenistan received gift funding from Chevron which was included as part of the additional USAID funds totaling \$1,240,000.

LN GENERATOR

The Chevron funded LNG - procured from a US-based manufacturer Kelvin International Corporation in Year 2 by AgTech - has been supplying project AI activities and beneficiaries. All established project AI Centers currently have access to a consistent supply of LN necessary for proper storage of imported genetic material. The direct beneficiaries include the AI service providers who require project provided straws of bull semen to remain frozen until the time of insemination. Indirect beneficiaries include all the farms that receive AI services to increase the quality of their cattle breeds through Project trainers. The consistent access to LN has not been possible prior to the generator's procurement. To date, the project AI centers and project participants have received around 50 L of LN per month.

M&E TARGETS AND RESULTS FOR CHEVRON FUNDING

Indicator		Year 2		Year 3		Year 4
Number of direct and indirect beneficiaries (disaggregated by women/men and adults/youth under 18);		55 total	54 male	2005 total	1066 male	
			1 female		939 female	
			55 adults		2005 adults	
			0 youth		0 youth	
Number of partners leveraged		1		1		
Dollar amount of funds leveraged through partnership	Initial USAID Contribution	\$2,464,076		\$1,160,415		
	Chevron Contribution	\$114,296.17		\$335,703.83		
Amount of in-kind contribution leveraged through partnership		\$0		\$0		