



# MIDWEST APPLE IMPROVEMENT ASSOCIATION

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## President's Message

Jim Eckert

The annual meeting of the Midwest Apple Improvement Association was held last November in Indianapolis in conjunction with NEC-1009 (formerly NE-183) Fruit Professionals Meeting. Their group was virtually a "Who's Who" in tree fruit, with attendees from Washington to Nova Scotia and points south. We had the opportunity to tell of our apple breeding efforts, and I wish to thank Peter Hirst for both the suggestion and execution of this joint meeting.

Many of you are familiar with the NEC-1009 efforts to test apple varieties and root stocks across many climates and locations. This mission is being chilled by both economic forces in the industry and plant patent laws which have effectively shut the door on the old notion widely dispersed testing of new plant material.

Economic reality has always faced the MAIA, and our board has made the decision to become an Ohio not-for-profit corporation with 501(c)(3) status. This allows tax deductibility for contributions and hopefully deepens the pool of potential donors. The math of X number of apple growers times \$100 annually does not add up to sustainable apple breeding. So, we look forward to finding some new friends to join our old ones.

We have eight years of apple breeding under our belt, and are budding some initial selections this year. Stay tuned and keep your dues current.

## New Apples Stimulate More Than the Palate!

Ed Fackler

Last fall's MAIA meeting was a whopping good time. We had some new apples to sample from many MAIA crosses from several locations. Some of these are easily candidates for further evaluations and it is my intent to make a couple of trees each available to MAIA members as quickly as possible. And of course the common parent that induces excellent precocity, great texture and off-the-chart flavors is GoldRush. And many of these selections exhibit these very desirable characters.

Purdue's Peter Hirst put this meeting together with the NEC-1009 group which is a regional research cooperative effort to evaluate all tree fruit types for a host of applications. And during the varied sessions, many very important questions were asked and with some, there were no clear answers. Serious discussion occurred on the following topics.

### Diane Miller's Ventures to Southern Asia.

Diane has made several trips to both Kazakhstan and Kyrgyzstan during the last several months. And in a recent trip to Kyrgyzstan she located an abandoned (because of the break up of the Soviet Union) elite apple collection. She wants to return this coming fall to evaluate fruit and continue her efforts in getting future cooperative activities firmed up to hopefully access this collection for possible importation to the US. I strongly suggest that we support her in every conceivable way including monetary donations where possible.

### Methods of Rouging out Clear Losers and Identification of Potential Winners.

The general consensus was to spray paint the trunk with RED and cut those trees out at first opportunity. Also in order to readily locate the potential "winners" an application of bright yellow

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# Wild and Domesticated Apples in the Kyrgyz Republic

Diane Miller

The wild apples in Kazakhstan have received global interest but it is possible that the wild apples of the Kyrgyz Republic (also called Kyrgyzstan) may be more adapted to Midwest US environmental conditions. Kyrgyzstan is the country immediately south of Kazakhstan and is a relatively small, mountainous, land-locked country. In the Soviet scheme, Kyrgyzstan was a meat-producing region. Post-Soviet, Kyrgyzstan has struggled to find its way. While Kazakhstan has prospered due to international development of its oil reserves, Kyrgyzstan has incredible natural beauty but little infrastructure to capitalize on this tourism potential. From an outsider's perspective, Kyrgyzstan looks like an undeveloped Switzerland. The Tien Shan Mountains extend from Kazakhstan throughout Kyrgyzstan. In Kyrgyzstan the dominant forest species are *Juglans regia* (walnut) and apple.

From May 27 – June 26, 2005, I viewed both wild and domesticated apples in Kyrgyzstan through the Winrock International Central Asia Farmer-to-Farmer Program. This came about due to connections made during the U.S. State Department Fulbright project on apples in Kazakhstan that I undertook from August – December 2004 (and reported on in a previous MAIA newsletter). I'm providing here excerpts of the report that was completed with the project goal being for Kyrgyzstan to better understand where it stands with apples from a global perspective. The very short answer is that Kyrgyzstan has vast wild apple reserves and the genetic potential of this material is basically undetermined. Because I was there during late spring (of a frost year) it was not possible to evaluate fruit quality. Kazakhstan has received the apple recognition globally due to specialists who were able to interact with germplasm collection endeavors post-Soviet. Kyrgyzstan was difficult to access, lacked *Malus* experts and basically missed the post-Soviet opportunities. My excitement about this Kyrgyz apple germplasm revolves around its potential better adaptability for us (surrounding plant species made it look like home).

## Scope of Work:

The goals of the project were to evaluate existing knowledge of apple varieties in Kyrgyzstan, to determine both producer and consumer awareness of important genetic traits, and to assess utilization of wild *Malus* genetic resources in local variety improvement. To achieve these goals, orchards and household gardens were visited in the Lake Issyk-kul area, bazaars were visited in both north and south Kyrgyzstan, seminars were held with leading orchardists and nursery personnel, discussions and field tours were held with foresters in the Jalabad area where wild apple is an important part of the walnut-fruit forests, and a seminar on international horticulture project development (IPGRI) was attended.

## Recommendation Summary:

Wild apple trees occur as forest trees throughout much of the mountainous areas of Kyrgyzstan, appearing broadly adapted across a wide climatic range. Kyrgyzstan has not developed this vast genetic potential however, relying predominately on apple varieties which were developed in Russia and grafted onto wild apple seedling rootstocks. There has been little or no selection of interesting traits ("elites") from wild seedlings, with foresters focusing on the walnut instead. While orchardists and nursery personnel do have reasonable knowledge of desirable traits in apple varieties, they do not have awareness that an apple breeding/selection program for Kyrgyzstan involving wild apple germplasm is possible. The common opinion is that varieties from other countries, especially the U.S., are "better" than anything that could be developed locally and all are willing to graft new imported varieties in place of older Russian varieties. There is no knowledge of virus-indexing of nursery trees to ensure healthy trees. Incredibly, there were fresh apples in the bazaars by the end of May, demonstrating the rich genetic diversity present in the species. Orchards and household gardens are inefficient and householders have little awareness of gardening practices which can result in better quality fruit, despite the fact that these fruit gardens are critical for both food and cash sales. Disease and insect problems in fruit orchards, and gypsy moth epidemics in the wild apple, are major limiting factors in tree health and fruit quality. To begin to develop the apple potential that exists in Kyrgyzstan, the following recommendations are made:

## From the forestry side

### Identify a university person who will specialize in apple.

This person can become an international colleague for global fruit science research. There currently is no "point person" that international scientists can contact for information and collaborative research. Of course, also being advocate for maintenance of this wonderful *Malus* germplasm in the wild (as forestry tree) will be an important role for this position. This person will work with "in situ" and "ex situ" germplasm preservation programs around the world to protect the national rights of Kyrgyzstan as owner of the germplasm and to facilitate appropriate financial gain for the country from its legitimate use. In Soviet times, Kazakhstan (not Kyrgyzstan) was identified as the fruit area, but having spent time in both countries, the genetic potential for apple in Kyrgyzstan appears extremely interesting. There are very qualified foresters in Sara-chelek, Arslanbob, Kar-alma and Jalabad who are currently contributing to germplasm preservation and who could additionally contribute to germplasm identification.

### **Identify wild apple genetic resources with interesting/valuable traits.**

There are many desirable traits which are not known in currently existing world apple germplasm collections, e.g. codling moth resistance, multi-gene disease resistances, flavorful red apple flesh, spring blossom frost resistance, etc. It would only take identifying one new trait from the wild forests to get a rush of excitement and financial investment. I met several foresters who could become part of a team, along with interested local citizens, in scouting wild fruit forests or planted areas for desirable traits.

### **Establish field plots of “elites.”**

Once some wild “elites” are identified and established in replicated field plots, it will be easy and interesting to involve the world community of apple scientists in field, laboratory and molecular analyses of the material. This will result in collaborative research to the benefit of Kyrgyzstan, and will enable graduate students and faculty to perform field research projects on “in situ” or “ex situ” screening for various desirable characteristics.

### **Breed for Kyrgyz apple varieties.**

This will be a natural progression. It is even possible that some wild “elites” will have enough good characteristics to be considered as variety releases for Kyrgyzstan. Crosses for seed can be made at field plot sites and seedling trial areas can be in forestry areas. Selection of potential candidates can be made by a team of horticulturists, propagation can be done by nursery personnel, and advanced testing of candidates can be done at several sites around Kyrgyzstan. Selection and naming of varieties can be done by a vertically integrated team containing scientists, nursery personnel, orchardists and consumers. Royalties from the sales of trees or the fruit themselves can be used to fund this long-term objective. More importantly, high fruit quality, disease resistant varieties that are from Kyrgyzstan will form the basis of horticultural fruit production, instead of relying on over-produced varieties from other countries. This goal is never finished as the team will always be seeking better adapted, higher quality, more unique varieties. It is also possible that unique forest types will be identified.

### **From the Horticulture side**

#### **Develop educational modules containing horticultural apple production information and use these to train Kyrgyz horticulturists.**

There is a wealth of knowledge available in the world on techniques for improving apple production efficiency and fruit quality. There is no need for Kyrgyzstan to independently develop this material but there is an immediate need to get this information into the hands of orchardists, nursery personnel and home gardeners. Educational modules should be developed which will “train the trainers.” In every village that I visited there were one or two very interested individuals who, when properly trained, could educate the rest of the village on proper fruit growing techniques. Educational units should focus on: tree physiology, fruit physiology, variety development and quality characteristics, orchard establishment, pruning and training, harvesting protocols, insect management, disease management, storage, and marketing.

### **Develop fruit growing and marketing organizations.**

The villages will financially benefit from working together on fruit growing and marketing. They will need assistance on how best to organize to do this. As the marketing picture is unclear to me, I cannot advise at this point on how best to do this, but am sure advice and assistance can be obtained. The “driver” for improving fruit quality will be higher prices for higher quality fruit. The current “Camas” truck system of fruit selling does not make that an obvious given and there are likely better marketing channels! Once an organized system of fruit selling is developed this will be a formidable marketing tool to achieving higher prices.

### **Photo Captions**

- A) Progressive “Barscoon Pitomnik” Farm, Tamga village, Issyk-kul Oblast, Kyrgyzstan; apple rootstocks and apricot seedlings.
- B) Young orchard in eastern Kyrgyzstan. Although Kazakhstan was the “orchard center” in Soviet times, some orcharding was done in Kyrgyzstan also. Current knowledge of best production practices is limited, as is ability to control disease and insect problems. Varieties grown are Soviet although the interest in new varieties is great.
- C) Kyrgyz apple growers tending an old Soviet orchard. Orchard managers were mostly Soviet and most left Central Asia at the break-up of the Soviet Union. In post-Soviet times, the entire chain from producer to consumer has disintegrated and has not been re-built.
- D) Fruit cluster in the Sary-chelek Global Biosphere Reserve, Jalal-abad Oblast, western Kyrgyzstan. This protected area was established by a UN-funded project. The area contains 50 acres of planted wild apple seedlings, along with lots of naturally occurring wild apple.
- E) Pink inside of “new crop” apple; these seeds are now seedlings to be planted at Dawes Arboretum this spring for MAIA evaluation.
- F) This “new crop” apple was in the fruit markets in Bishkek on June 1. My guess is that it is selected directly from the wild.
- G) Attendees at joint meeting of MAIA and NEC-1009. Bagged fruit is GoldRush x CQR10T17.
- H) Fruit from CQR10T17 x Coop 25 (Scarlet O’Hara).
- I) Fruit from GoldRush x CQR10T17.
- J) Fruit from GoldRush x Sweet 16.

**MAIA 2006 Meeting  
Eckert Orchard  
Belleville, IL  
Wednesday, October 4**



# Spring 2006 MAIA Update

Diane Miller

A big "Thanks!" to all of you who have participated in the work at Dawes and a special thanks to Mitch Lynd and Gregg Bachman (our local connections) for their hard work.

Here's a brief update on the "to do" list for Spring 2006.

**1) Tree care at Dawes:** Mitch Lynd is working hard on this! He is beating back the blackberries and freeing the seedlings. He already has Casoron herbicide on for this season. Hopefully also we will get some stakes on the elites in the older fenced area as several of these are leaning on B9 or M9 rootstocks.

**2) Tree planting at Dawes:** MAIA has a few thousand trees to get "socked in" at Dawes this Spring. These include the red-leafed seedlings from Kazakhstan, some other Kazak material, several controlled crosses (including the first crosses using pollen from the best Kazak trees at Dawes), and some miscellaneous stuff accumulated the last couple of years.

**3) Seedlings in the pipeline:** There apparently are some of Anna and Jules' crosses at MeadowLake nursery in Oregon. These will be grown another season and then sent to MAIA. The 5000 seeds of Goldrush (pollen) by Honeycrisp sent to MeadowLake last spring were lost due to bird damage in the nursery rows. So this is painful.

**4) Seedlings to grow:** Anna and Jules have created a couple thousand controlled cross seeds which will be germinated this Spring. Diane has many thousand GoldRush (pollen) by Honeycrisp seeds which will be grown this Spring. We are looking for the long-term solution of where to grow seedlings economically and productively. Greg Miller is germinating the Purdue seedlings in the greenhouse for later planting in the nursery rows. The OSU seedlings are being direct seeded into nursery rows by Greg (due to a lack of greenhouse space the apples occupy a lower priority than his chestnuts, if you can imagine) and we hope for the best.

**5) Crosses to make this Spring:** I listened to a breeder from Spain talk at the IFTA meeting about breeding strategy and was interested that his group focused each year on a single cross and tried to make significant enough numbers of seeds to satisfy the objective. We have had the GoldRush/Honeycrisp objective and have a lot of seeds (20,000 or so) and hopefully at the end of this growing season we will actually have some seedlings. What should be the objective for this crossing season and how many seeds do we need? There is no doubt that a red-fleshed, crisp textured, disease-resistant apple would be a hot item but what should we use for breeding parents and should we wait until some of the Kazakh red material starts to fruit and then use it as pollen? Or should we go ahead and use the best red-fleshed material out there (which is what?) and cross it with GoldRush or Honeycrisp? I have not verified any red-fleshed apples with scab resistance.

**6) Central Asia collaboration:** I returned last week from a week at the International Plant Genetic Resources Institute (IPGRI)

([www.ipgri.cgiar.org/index.htm](http://www.ipgri.cgiar.org/index.htm); [www.underutilized-species.org](http://www.underutilized-species.org)) in Rome talking with scientists there about apple conservation and evaluation in Central Asia. All of IPGRI's activities are carried out within one of 15 projects managed by the programmes and the research and support units:

## **Diversity for Livelihoods Programme:**

Project E01 Agricultural Biodiversity and Ecosystems

E02 Community Management of Agricultural Biodiversity

E03 Agricultural Biodiversity, Human health and welfare

## **Understanding and Managing Biodiversity Programme:**

Project E04 Conservation of Agricultural Biodiversity

E05 Use of Genetic Resources to Improve Livelihoods

E06 Conservation and Sustainable use of Forest Biodiversity

E07 Management, Access and Use of Genetic Resources Information

## **Improving Livelihoods in Commodity Based Systems Programme:**

Project E08 Conservation and Sustainable use of Coconut and other commodities

Project E09 Conserving, Understanding and Improving *Musa* (banana) Biodiversity

Use of *Musa* Biodiversity to improve livelihoods

## **Global Partnerships Programme:**

Project E11 Regional Collaborations for Sustainable Management of Agricultural and Forest Biodiversity

Project E12 Mobilizing International Partnerships to Use and Conserve Agricultural Biodiversity

## **Policy and Law Research and Support Unit:**

Project E13 Enabling Policy Environments for the use and conservation of Agricultural Biodiversity

## **Capacity Development Research and Support Unit:**

Project E14 Strengthening Human Capacity to Manage Agricultural Biodiversity

## **Public Awareness Research and Support Unit:**

Project E15 Raising Awareness to Create Support for Agricultural Biodiversity

IPGRI has a couple projects in progress in the region and a Central Asian coordinator. I presented a seminar on my experiences in Kazakhstan and Kyrgyzstan and made some suggestions for future work in the region. It's my goal for MAIA to collaborate with this international organization as they have the infrastructure, means and mission to work in this region. We are in the process of determining what sort of collaboration is appropriate and possible. Certainly horticultural knowledge is something MAIA can offer to the collaboration.

There is good news on the germplasm exchange and utilization front. Most of you are aware of the Convention on Biologi-

cal Diversity which granted sovereign rights of ownership of germplasm to the nations in which the material resides. Although the US did not sign agreement to this treaty, the Central Asian nations were partner to it and the exchange of germplasm was somewhat problematic (depending upon whom you talk with). There now is an International Treaty of Plant Genetic Resources for Food and Agriculture ([www.fao.org/ag/cgrfa](http://www.fao.org/ag/cgrfa)) which allows a multilateral system for access and benefit sharing and, as long as we work within the intent of this document, accessing some more interesting material from Central Asia will be possible.

The Global Crop Diversity Trust ([www.startwithseed.org](http://www.startwithseed.org)) is located at IPGRI headquarters and is working on an international strategy of germplasm conservation, utilization and documentation. Apple is one of the 35 crops currently being worked on. I believe the International Society for Horticultural Science and its genetic resources working group (with Kim Hummer as chair) will play an important role in this project. Currently however there is no one specifically designated as leader for the apple effort.

### New Apples Stimulate More Than the Palate!

low on the trunk would draw future attention. Of course the potential “winners” should have some type of permanent numbered reference. The central reason for this is simply for identity tracking purpose during the entire evaluation process (often 3 or more fruiting years prior to making a decision to propagate for further evaluation), the nursery prop (budding/grafting) process, distribution of budded trees to other evaluators, etc. It would seem logical to code these “elite” selections with the letter “M” (for MAIA) followed by the growers initials (JE, for Jim Eckert, for example) coupled with a sequential number such as MJE-1, MJE-2, etc. From personal experience, if meticulous labeling and subsequent record-keeping is not done, they can be easily lost (or mixed up) in this process.

**Defining Fruit Ripeness.** Ground color changes are the first indication, next would be flavor/texture and of course a darkening seed color. Storage evaluations are critical and apples should be placed into refrigeration, preferably at around 32°F in apple storage bags and sampled at weekly intervals. Pressure testing at weekly intervals would be helpful.

**Situation at Dawes Regarding Tree Planting and Subsequent Annual Care.** Currently there is no clear definition as to who will be performing this work. Mitch Lynd (and Lynd Fruit Farm crew) has been doing a bit of it for the last few years, but can't continue. The Dawes folks don't seem to warm up to another annual set of tasks. Quick resolution of this situation seems appropriate as we are only a couple of years away from filling up the first MAIA designated acreage. My question here is “do we want to allocate funds to Dawes to get this work done?”

**Legal Status of MAIA.** Almost since MAIA inception, we've annually discussed becoming 501c3 (non-profit) status without much actual movement in doing it for a host of reasons. Given the recent “discovery” of some potentially viable apple selections amongst our older plantings, I think it of paramount importance that MAIA becomes a legal entity simply to lawfully identify ownership of these apple selections. Reason: if dur-

## MAIA Finance Report

### INCOME

Dues .....	\$4,985.00
Donations .....	\$2,500.00
Interest .....	\$231.74
<b>Total Income .....</b>	<b>\$7,716.74</b>

### EXPENSES

Research .....	-\$2,500.00
Treasurer .....	-\$800.00
2005 Meeting .....	-\$698.87
Legal .....	-\$300.00
Postage .....	-\$99.58
Newsletter .....	-\$31.38
Office supplies .....	-\$11.43
<b>Total Expenses .....</b>	<b>-\$4,441.26</b>

**Balance on 12/31/05 .....** **\$11,354.17**

ing the next few years a decision is made to patent and commercialize a selection, we'll have to address ownership. Anyway, during a Directors meeting in January, 2006 in Columbus, OH there was general consensus to proceed. Director Susan Ramser volunteered to file for MAIA incorporation in the state of Ohio and after that is approved, she will file for 501c3 status. Hopefully this can be completed this year.

**Plant Patents.** Publicity of “new” plant or other patentable invention or discovery now has some influence on one's ability to patent it. There has been a recent decision from the US Patent Office that any form of publicity negates patentability. Therefore I'd suggest we use no names at all, but rather identity numbers (as described in No. 2 above) to identify and track these selections through the entire evaluation process.

**Pest Control Protocol.** Barring poor weather during this spring's bloom period many more trees should flower and set crops at many locations. I feel it is time for us to review and update our recommended pest control program for MAIA seedlings, especially those planted in 2000, 2001 and 2002. I believe we should have applications of both fungicides and insecticides in all sprays prior to July 1 and perhaps 1 or 2 fungicide applications after July 1.

Lastly I would like to thank all who attended last November's meeting especially Peter Hirst who went to great lengths to accommodate everyone's needs.

**A Note of this Fall's Annual Meeting.** Since many older seedlings are beginning to fruit heavily it seems appropriate to have a general meeting at one of these plantings during harvest to get some “hands-on” experience at evaluating new apples. Jim Eckert has agreed to host this fall's meeting and we'll meet at Eckert Orchard near Belleville, IL on Wed., October 4, 2006 expressly to walk and sample new apples. Jim has several hundred older trees of GoldRush x CQR10T17 and GoldRush x Sweet 16. Mark your calendar for this date. Meeting details will be published in early September.