



Roots of Peace Crop Income Projection Afghanistan, 2010



by Gary A. Kuhn

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1. Summary

Roots of Peace programs in Afghanistan focus on increasing income for rural farmers. To do this, Roots of Peace has been working with farmers to improve their current production and shifting farmers to higher market value crops. Higher market value crops, like perennial crops, on average return a net income 5 times that of grain crops. This is especially important as typical Afghan farmers have very small plots and must maximize their earnings potential with what little they have. If the Afghan farmers had larger plots and were able to mechanize their field crop cultivation, annual crops would be a viable alternative.

In Afghanistan a majority of the farmers grow annual crops with their irrigated small plots. Food security was crucial during the conflict years when food distribution was unreliable. The food markets have recovered and the necessity for each family to produce staples has diminished. Yet many farmers have not switched to the best crops. In Kandahar, a major grape and pomegranate producing province, 77% of the farmers grow annual crops. In Helmand Province the number is over 90%.

This report summarizes our work to evaluate the economics of farmer options in Afghanistan. ROP programs seek to move farmers from lower value crops to higher value crops. Farmers need to understand their options from a climatic and economic viewpoint. The variance between crops and between varieties of a certain crop is dramatic. Selecting the right crop for the particular growing area will have a significant impact on the farmer's net income. Markets fluctuate and prices change, making this an on-going analysis for farmers. 2010 was no exception. The year showed a large price increase in poppies and stable prices for the other key crops.

- Poppy prices up dramatically – now represent short-term economic advantage over grain crops and some fruit trees, albeit an illicit opportunity.
- Specific almond varieties represent large potential, wrong varieties have poor returns
- Introduced varieties of apples and cherries show good promise

2. Report Methodology

This report focuses on potential income from the various species that are grown in this country as staples and as cash crops. The report is not a summary of the current income for farmers in Afghanistan from these various species. There is a marked difference between actual production in Afghanistan and potential production. In our last survey of grape farmers, a majority of the farmers did not implement the basic set of cultural practices. On a more technical level, there is only one tractor equipped with laser levelers and seed plugging attachments in Afghanistan. This is a proven method to increase yields for most field crops. As for tree crops, all species have peak producing years, then their production tails off to a fraction of their potential. Like any living organism, they have their prime years. Studies of almond trees in California (nonpareil variety) show it is best to replant your almond orchard after 20-25 years. With the exception of the tree plantings over the last 5 years, almost every fruit tree in Afghanistan is 32 years or older, with most much older. Therefore farmers in Afghanistan have an opportunity to increase their income potential through best practices, current technology and orchard renewal.

This information is then used by our teams to educate farmers participating in Roots of Peace programs throughout the country. These farmers are being given an opportunity to change crops from their current, mostly grain crops, to higher market value crops.

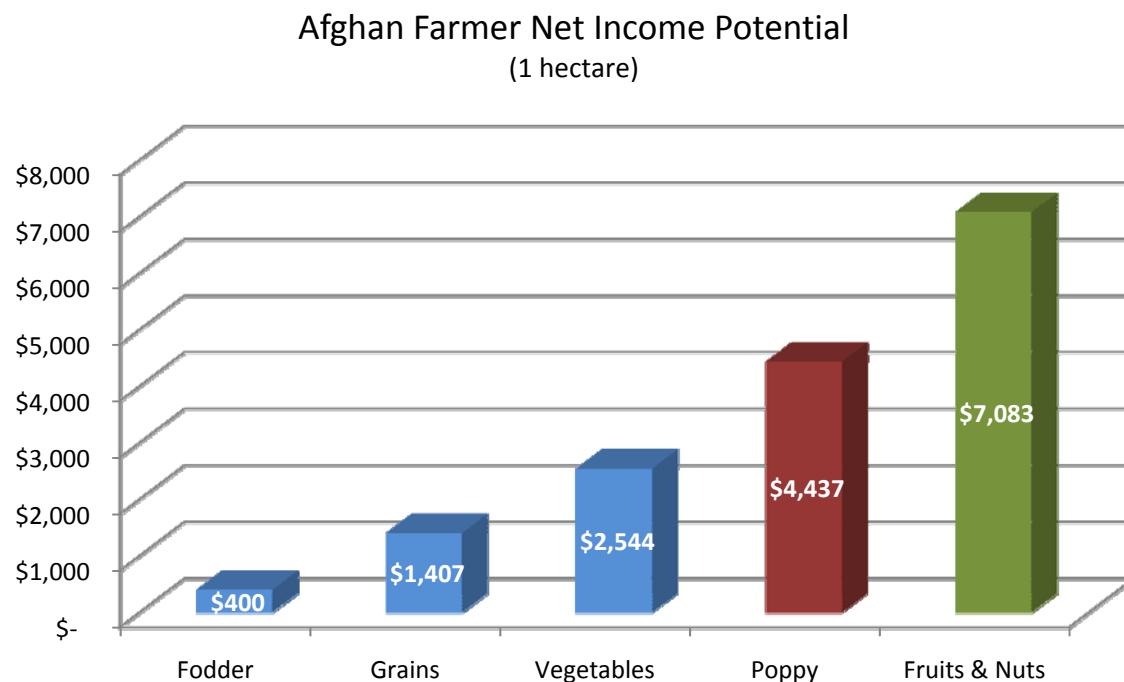
We have attempted to provide the most objective comparison between the varying crops. Included are all costs necessary to produce a harvest for sale at the farm. Costs that the farmer would normally do himself are reflected in the costs. Actual cash in the farmer's hands after harvest for these crops most likely will be higher than the projection, provided best practices are implemented by the farmer.

3. Net Income Comparison

The table below summarizes the net income for 1 hectare of land in mature production with good cultural practices and inputs. This represents the potential for these crops, not necessarily the current average production and income from these crops in Afghanistan.

Perennial crops continue to lead as the high market value crops with the field crops trailing behind. With the reduction in production of opium, prices have reversed their downward trend and are now climbing. This change has pushed up the net income of opium to higher levels than licit field crops and a few perennial crops. Opium prices have experienced large swings, whereas vegetable and perennial crops have been fairly stable. The opium price, like all crops in this report, reflects the price at harvest time. Opium was harvested in Helmand in early May this year. The price has climbed since.

Table 1: Income Potential by Crop Grouping

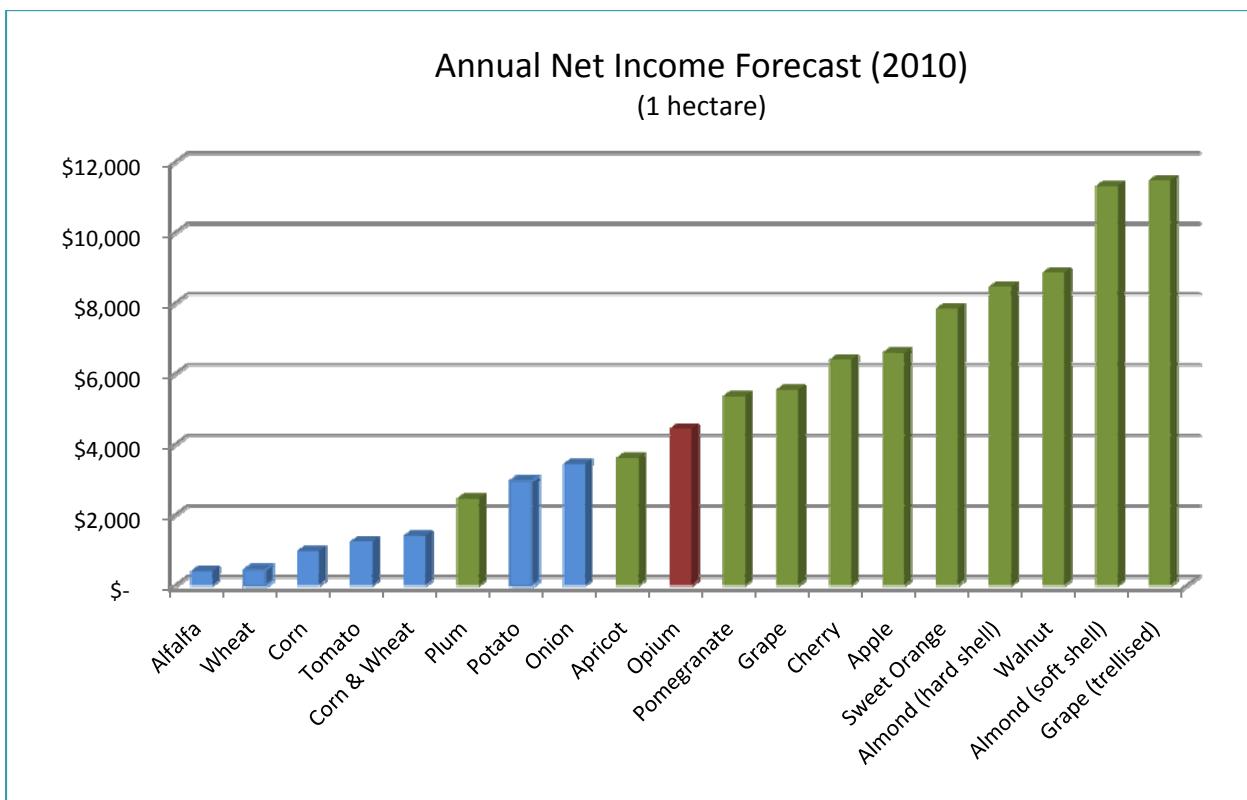


Source: Roots of Peace, 2010

The almost two-fold increase in Opium prices pushed returns above \$4,000, higher than some perennial crops. Net income in 2009 was a meager \$433 per hectare. Spot prices in Musaqala, Helmand reached \$268 per kg, which is near the all time high of \$301 per kg set in 2001. This price jump was in reaction to the reduced production last season. Production was down due to a number of factors, including a blight that was spread by aphids. Prices of most of these crops in the comparison below climb after harvest period. To make a consistent comparison, we use the harvest period price. The extreme volatility in the projected return from opium is in contrast to the more predictable vegetable and perennial crops. Wheat prices continue to recede from their high in 2008.

The table following provides net income on specific crops.

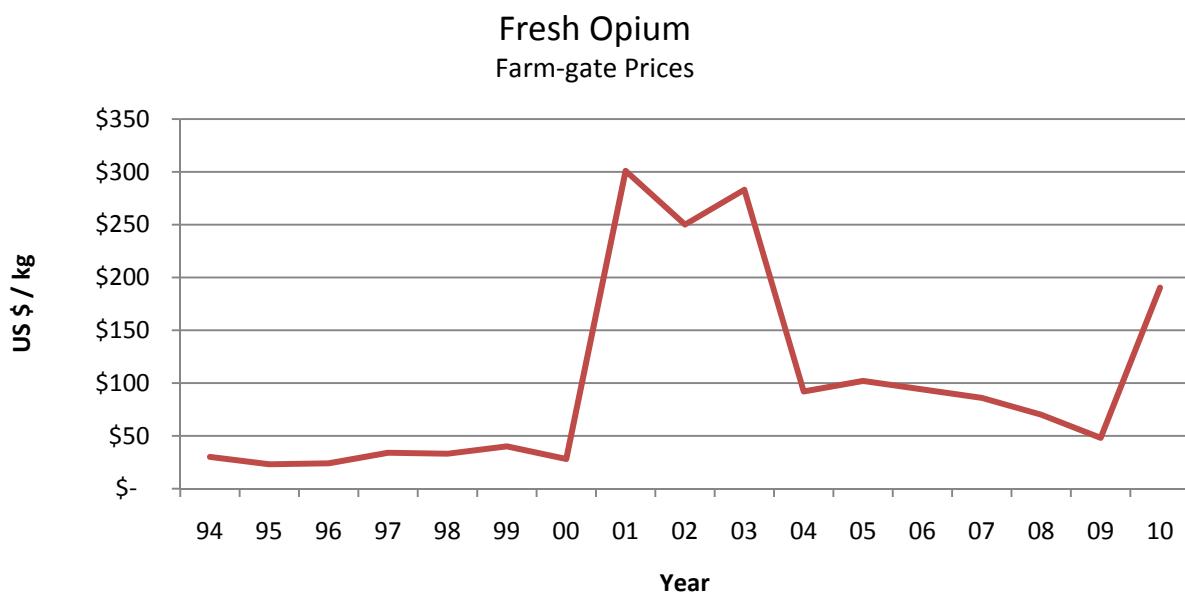
Table 2: Projected Income by Species



Source: Roots of Peace, 2010

Poppy price history is shown below. Opium prices historically have been in the \$35-\$40 per kg range until the early Taliban when production was stifled. Production then rose steadily, depressing prices through 2009. Reduced production has pushed prices steadily upwards starting late last year.

Table 3: Opium Price History



Source: United Nations, Office on Drugs and Crimes (UNODC) "2009 Annual Opium Poppy Survey in Afghanistan", December 2009. 2010 price are averaged spot prices in Musaqala, Hilmand.

4. Details on Net Income Potential

Below is the table for the selected field crops. This comparison is for one hectare. Prices reflect farm gate prices during harvest season. Yields reflect potential harvest with best practices implemented.

Table 4: Income Project Detail for Field Crops

	FIELD CROPS						
	Alfalfa	Corn White	Onion Red or White	Potato	Tomato Wantani	Wheat Hazardana	Opium <u>Watani</u> <u>Soorgulai</u> (fresh)
Gross Income							
Production	15,000 kg	6,000 kg	20,000 kg	20,000 kg	12,000 kg	2,800 kg	35 kg
Price (per kg)	\$ 0	\$ 0.27	\$ 0.22	\$ 0.25	\$ 0.16	\$ 0.34	\$ 190
Farm gate proceeds[8]	\$ 672	\$ 1,614	\$ 4,482	\$ 4,931	\$ 1,883	\$ 941	\$ 6,661
Other income from byproducts	\$ -	\$ 134	\$ -	\$ 45	\$ 45	\$ 112	\$ 62
Gross Income	\$ 672	\$ 1,748	\$ 4,482	\$ 4,975	\$ 1,927	\$ 1,053	\$ 6,722
Costs Per Hectare							
Seed	\$ 1	\$ 28	\$ 77	\$ 1,031	\$ 103	\$ 50	\$ 5
Soil Amendments							
DAP quantity	10 kg	125 kg	50 kg	75 kg	50 kg	125 kg	250 kg
DAP cost	\$ 8	\$ 104	\$ 41	\$ 62	\$ 41	\$ 104	\$ 207
UREA quantity	0 kg	450 kg	75 kg	50 kg	100 kg	250 kg	250 kg
UREA cost	\$ -	\$ 131	\$ 22	\$ 15	\$ 29	\$ 73	\$ 73
Total Input Costs	\$ 9	\$ 263	\$ 141	\$ 1,108	\$ 174	\$ 227	\$ 285
Labor							
Unskilled Labor Days	25 days	30 days	25 days	25 days	25 days	15 days	120 days
Unskilled Labor Cost	\$ 84	\$ 101	\$ 84	\$ 84	\$ 84	\$ 50	\$ 403
Semi-skilled Labor Days	10 days	0 days	0 days	0 days	0 days	20 days	0 days
Semi-skilled Labor Cost	\$ 45	\$ -	\$ -	\$ -	\$ -	\$ 90	\$ -
Skilled Labor Days	0 days	20 days	40 days	20 days	20 days	0 days	125 days
Skilled Labor Rate	\$ -	\$ 134	\$ 269	\$ 134	\$ 134	\$ -	\$ 840
Total Labor Costs	\$ 129	\$ 235	\$ 353	\$ 219	\$ 219	\$ 140	\$ 1,244
Farm Services							
Tractor ploughing	\$ 67	\$ 101	\$ 101	\$ 202	\$ 101	\$ 101	\$ 84
Threshing	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 47	\$ -
Total Farm Services	\$ 67	\$ 101	\$ 101	\$ 202	\$ 101	\$ 148	\$ 84
Taxes(ushr) paid to local authorities [2]	\$ 67	\$ 175	\$ 448	\$ 498	\$ 193	\$ 105	\$ 672
Total Costs	\$ 273	\$ 774	\$ 1,043	\$ 2,025	\$ 686	\$ 620	\$ 2,285
Net Income	\$ 400	\$ 974	\$ 3,440	\$ 2,950	\$ 1,242	\$ 433	\$ 4,437

Source: Roots of Peace, 2010

This table provides the income analysis on selected fruit and nut crops grown in Afghanistan. This is for 1 hectare. Yields reflect potential harvest with best practices implemented. Prices are during harvest time.

Table 5: Projected Income for Perennial Crops

	PERENNIAL CROPS							
	Almond Tarash Mazari (shelled)	Almond Satarbai (shelled)	Apple Blushing Golden	Apricot Amiri	Trellised Grapes[1] Fresh Shindur Khani	Pomegra nate Shongul Khani	Sweet Orange Valencia Olinda	Walnut Kaghazi (shelled)
Gross Income								
Production	1,600 kg	1,200 kg	25,200 kg	14,000 kg	20,000 kg	21,600 kg	17,500 kg	2,850 kg
Price (per kg)	\$ 6.72	\$ 11.60	\$ 0.34	\$ 0.25	\$ 0.67	\$ 0.34	\$ 0.56	\$ 3.88
Farm gate proceeds[8]	\$ 10,758	\$ 13,920	\$ 8,472	\$ 3,451	\$ 13,447	\$ 7,261	\$ 9,805	\$ 11,050
Other income from byproducts	\$ 27	\$ 27	\$ 134	\$ 1,820	\$ 62	\$ 27	\$ 27	\$ 27
Gross Income	\$ 10,784	\$ 13,947	\$ 8,606	\$ 5,271	\$ 13,509	\$ 7,288	\$ 9,832	\$ 11,077
Costs Per Hectare								
Soil Amendments								
DAP quantity	45 kg	45 kg	45 kg	45 kg	25 kg	100 kg	45 kg	45 kg
DAP cost	\$ 37	\$ 37	\$ 37	\$ 37	\$ 21	\$ 83	\$ 37	\$ 37
UREA quantity	100 kg	100 kg	100 kg	100 kg	150 kg	300 kg	75 kg	100 kg
UREA cost	\$ 29	\$ 29	\$ 29	\$ 29	\$ 44	\$ 87	\$ 22	\$ 29
Mulch & top soil quantity	20 MT	20 MT	20 MT	20 MT	4 MT	20 MT	20 MT	14 MT
Mulch & top soil cost	\$ 71	\$ 71	\$ 71	\$ 71	\$ 14	\$ 71	\$ 71	\$ 50
IPM (Gib, sulfur, Bordeaux mix...)	\$ 90	\$ 90	\$ 112	\$ 90	\$ 202	\$ 90	\$ 90	\$ 90
Total Input Costs	\$ 227	\$ 227	\$ 249	\$ 227	\$ 280	\$ 331	\$ 219	\$ 206
Labor								
Unskilled Labor Days	165 days	165 days	165 days	165 days	71 days	165 days	165 days	165 days
Unskilled Labor Cost	\$ 555	\$ 555	\$ 555	\$ 555	\$ 239	\$ 555	\$ 555	\$ 555
Semi-skilled Labor Days	40 days	40 days	40 days	40 days	6 days	40 days	30 days	40 days
Semi-skilled Labor Cost	\$ 179	\$ 179	\$ 179	\$ 179	\$ 27	\$ 179	\$ 134	\$ 179
Skilled Labor Days	35 days	35 days	25 days	25 days	20 days	20 days	15 days	25 days
Skilled Labor Rate	\$ 235	\$ 235	\$ 168	\$ 168	\$ 134	\$ 134	\$ 101	\$ 168
Total Labor Costs	\$ 969	\$ 969	\$ 902	\$ 902	\$ 400	\$ 868	\$ 790	\$ 902
Farm Services								
Pollinators	\$ 45	\$ 45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Farm Services	\$ 45	\$ 45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Taxes(ushr) paid to local authorities [11]	\$ 1,078	\$ 1,392	\$ 861	\$ 527	\$ 1,351	\$ 729	\$ 983	\$ 1,108
Total Costs	\$ 2,319	\$ 2,636	\$ 2,012	\$ 1,656	\$ 2,031	\$ 1,928	\$ 1,993	\$ 2,216
Net Income	\$ 8,465	\$ 11,311	\$ 6,594	\$ 3,615	\$ 11,478	\$ 5,360	\$ 7,839	\$ 8,861

Source: Roots of Peace, 2010

Notes:

[1] Roots of Peace surveyed vineyards before and after trellising. After 2 years, trellised vineyards yield increased 107%.

[2] 100% growers in Kandahar and 72% growers in Helmand pay "taxes" or usher to AGE, government officials and religious leaders. The majority of ushr-paying farmers pay approximately 10 per cent of their income from cultivation in taxes. These taxes are paid to one or more sources, such as district administrators, local commanders, mullahs, security commanders or anti-Government elements including the Taliban. The majority share goes to mullahs, the Taliban and local commanders. Source: UN ODC Afghanistan Opium Winter Rapid Assessment Survey, February 2008.

[3] Packaging for harvest is not included in any of these calculations as traders typically cover these costs.

[4] Exchange rate - \$1 = 44.62 Afs

[5] Some crop yields are reduced for regional problems. Apples are reduced by 10% for Codling moth and pomegranate harvest is reduced by 10% for splits

[6] Apple yield estimate was increased over 2009. Original estimate was for "local" varieties. The new yield estimate is for the new variety, Blushing Golden.

[7] Prices for apples represent 2009 pricing as the apple season had not started as of the date of this article in 2010.

5. Sources of Information & Approach

The survey compares all crops at farm gate in a harvested state, ready for sale. Even though some crops are harvested by trader's employees, we included the cost of harvesting in all cost estimates to make a valid comparison. Roots of Peace has agriculture teams in every major production area in Afghanistan. These teams are made up of technical production advisors and market development advisors. Currently Roots of Peace team includes over 500 people employed to support high value Afghan agriculture. We work directly with over 60,000 lead farmers and over 50 leading traders. A majority of the information in this report came directly from our field teams.

NET INCOME VERSUS GROSS INCOME

This survey focuses entirely on net income as opposed to gross income. Our focus is not the macro-economic analysis of agriculture in Afghanistan. Rather we are focused on a micro-economic scope, focused on the farmer. We are focused on what the farmer will feel in his pocket. The second reason is that each crop has differing cost characteristics. Some tree crops have very low labor content and low overall costs, while other, like opium, have large labor costs. The best comparison includes these costs. Gross income is well suited for macro-economic evaluation. This report is focused at the farm level.

CROP PRICES

The ROP team collected information on current prices from the traders we work with, from spot checks in key markets to actual farm gate transactions. We verify our information versus price reports from other sources. ROP programs include marketing activities for all the major crops. Therefore we can directly access real trade data from the fifty traders we support. The prices we use represent prices

during the peak times of harvest, not early or late pricing. The prices reflect current season prices, except late season crops like apples. For apples we used the previous season price.

YIELDS – POTENTIAL VERSUS CURRENT PRODUCTION

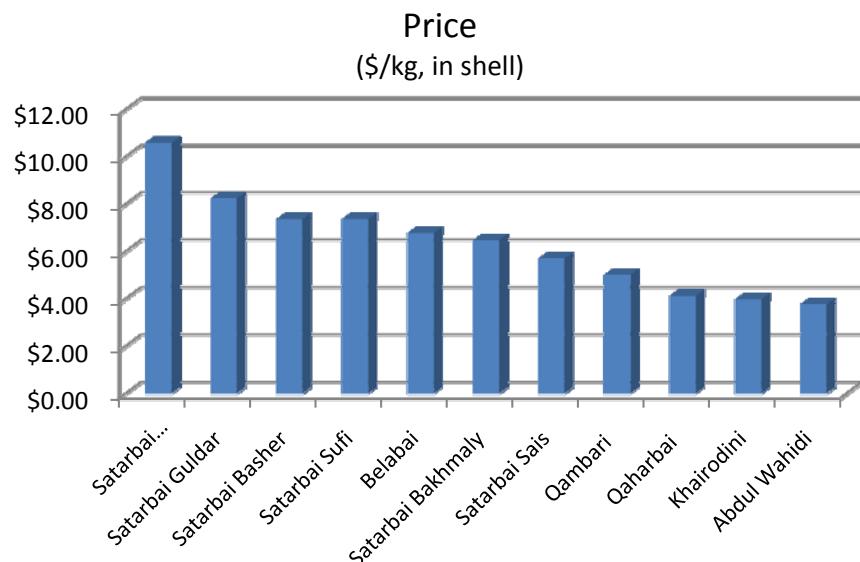
Yields in Afghanistan vary over a wide range. An overwhelming majority of the trees growing in Afghan orchards are well beyond their prime producing years. In most cases the trees were planted before 1978, the last peaceful year in the country. That means the youngest of the current producing trees are 32 years old with most well into their 40s and 50s. This is very old in a tree life. Combined with less than optimal cultural practices and farmers have yields that are well off the potential.

Yields listed in the analysis are what is the potential for each crop, given vibrant trees and best practices for orchard care. This yield is used instead of an average current production since this more closely represents the farmer options in deciding upon the best crop alternative. Farmers with our programs and other NGOs will plant new healthy trees and will be trained with the best practices, so these higher yields are the most likely scenario. The key here is that achieving the potential yields do depend upon good training. Simply delivering new trees will not produce vibrant orchards.

VARIETY COMPARISONS

Differences between variety selections are important. Planting commercial varieties are key. By commercial varieties, we mean varieties that are in demand within the South Asia region and command a premium price over other varieties and have the ability to be packed and shipped. To illustrate the differences in the varieties, here are the more popular varieties of Afghan almonds. Satarbai Mamakhail price is almost three times higher than the price of Abdul Wahidi.

Table 6: Farm Gate Price for Almond Varieties



Source: Roots of Peace, 2010

COSTS

The ROP team evaluated current prices in the markets and in the production zones. We averaged costs for the country and did not attempt to regionalize costs even though some of these crops only grow in certain regions. We used one price for products across all crops, eg. one cost for DAP for all crops. The prices were assessed in July and August. In some cases certain prices do in fact vary by region, like Ushr or “local taxes”. We chose to establish a single rate and apply it uniformly across all crops.

ADJUSTMENTS TO SPECIFIC CROPS

We have adjusted yields on specific crops due to known conditions in Afghanistan. An example is Codling Moth infestations ravage apply yields. With best practices using organic methods, the impact can be reduced to 10% loss. We reduced the crop yields for apples by 10%. Pomegranates are another example. We reduced pomegranate yields by 10% for splits.

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Ahmad Shah Shafaq

Alem Alemi

Alvaro Pacheco

Ferenc "Francisco" Sandor

Gary Kuhn

H. Saleem Mohammed

Jean-Pierre Detry, PhD

J. D. Zach Lea, PhD

Sharif Osmani

Zarif Osmani

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Special thanks to our donors. Without their funding and support Roots of Peace would not be able to reach so many Afghan families with such positive life changes. This analysis provides basic inputs to education materials for our farmer training. We educate farmers on their options, and then support them to implement their decisions.

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