



<b>From</b>	Agri Knowledge Centre
<b>To</b>	EMT Members, Agri Commercial Officers (ACO's)
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## 1. Summary – Quick Guide Passion Fruit Sector

### *Facts and figures:*

	<b>Fresh</b>	<b>Juice</b>
<b>Yield in tons per ha</b>	4.2 per year	4kg fresh = 1 litre pure juice
<b>Cost in RWF</b>	238/kg	2600/litre
<b>Price in RWF</b>	500 – 800/kg	3000/litre
<b>Plants per ha</b>	1650	
<b>Harvest</b>	4 months, 2x per year	Whole year

### *Main risks:*

- Passion Fruit Woodiness virus. The disease is only visible during the harvest time when investments are already made.
- Damage of products during transport, collection and storage.
- Lack of market power of cooperatives and growers and lack of availability of supply for processors.

### *Financing opportunities:*

The special purple specie and the fine quality and taste in combination with the good growing circumstances in Rwanda, gives this crop great opportunities. At this moment the financing opportunities are limited due to the Woodiness virus crisis. When the situation normalizes again there are opportunities for Save for a Loan, input finance for plants, fertilizer, labour and land for growers. Raw material collection finance for cooperatives that collect fruit and sell it to traders. Asset finance is possible for transportation vehicles and processing machinery for cooperatives and processors.

## **2. Introduction**

Passion fruit is a plant that is commercially cultivated for its fruits. The fruit is oval and yellow or dark purple at maturity with a soft juicy interior. The Rwandan passion fruit is purple and of very good quality and therefore wanted by the neighbouring countries. The fruit is grown in Rwanda for eating the fresh fruit or for its juice (RDB, 2010).

Since the beginning of this decade more and more farmers started growing passion fruits. The cultivation of passion fruit has shown a great capacity to increase farmers' incomes in rural areas. Unfortunately the cultivation of this plant has been decimated by the Passion fruit Woodiness virus that hit especially the Northern Province, but also other areas are affected. The virus first affects the fruits and thereafter the plant dies. Lots of growers lose their whole crop. The first reports about this disease are from 2006 and the peak was in 2008 – 2009, but even today new damages are reported. The only way to fight against the Passion fruit Woodiness virus is to use healthy seeds. Although, even with healthy seeds, it's not sure the crop could not be affected again by this virus.

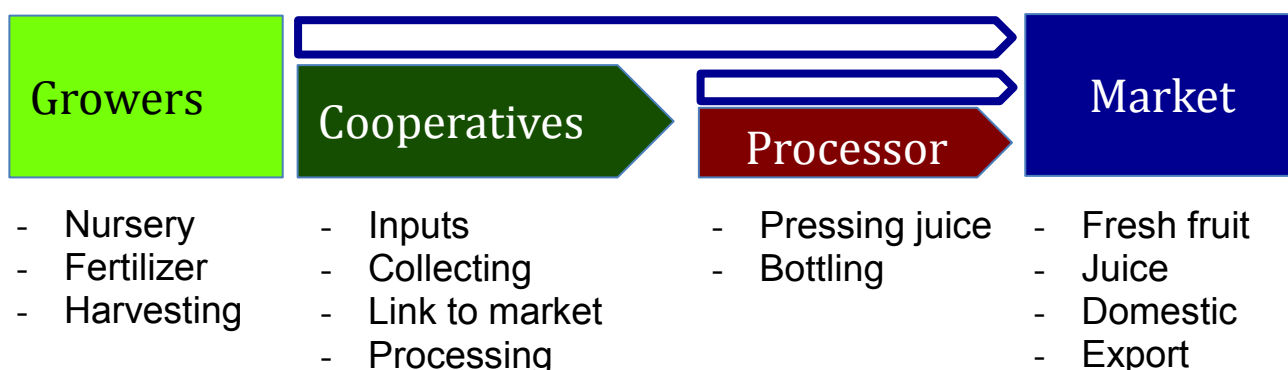
The cultivation of passion fruit is found almost everywhere in Rwanda but especially in the Eastern, Western and Northern Provinces. Passion fruit is grown in regions with high altitude (900M to 2500M). The temperature ranges between 14C-25C. The soil is loam with a sand upper layer. The needed rainfall is between 900-1900mm. The average production is 4,2 tons per ha (RDB, 2010).

Most of the passion fruit is sold locally as fresh fruits and a small part is sent to factories to be pressed into juice. The price for passion fruit on the local market has doubled in the last years. This steep price increase is due to the virus that affected the production of many farmers.

The virus implies a shortage of passion fruit on the market and decreases the export of fresh fruits to almost nil. There is some import from neighbouring countries: Burundi and Uganda (NAEB 2012). On the juice market there is a lot of competition from these neighbouring countries because they can produce the juice cheaper.

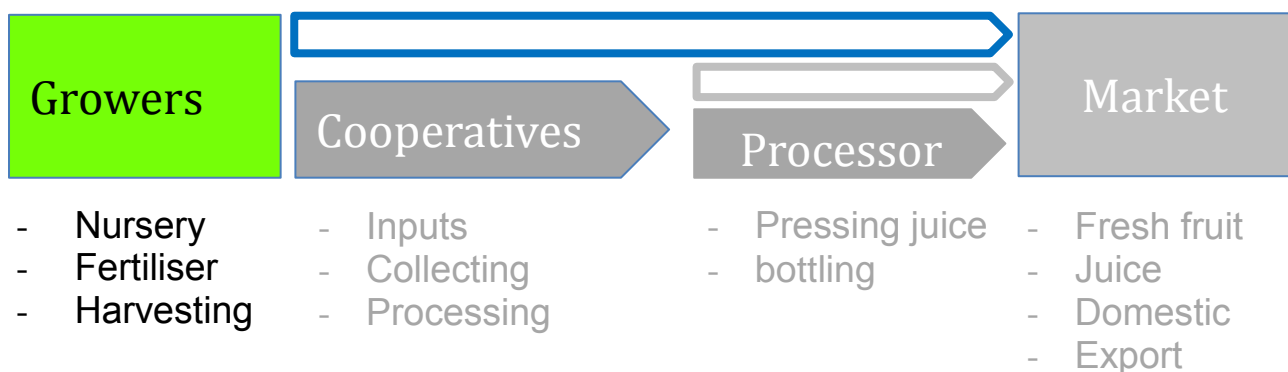
Many growers are united in cooperatives to improve their yield and get better access to the market. Some unions combine the production of cooperatives before transport to a processor. Currently, some new fruit collection centres are developed by NAEB to decrease transport costs and keep the fruits in better quality.

### 3. Passion fruit Value chain



The passion fruit value chain is in general simple and short. Many of the small growers sell their passion fruits on the local market. Growers are sometimes united in cooperatives. The cooperatives collect the fruits and sell them to traders / the market or a processor. There are also cooperatives that process the passion fruits to juice themselves. There is almost no export and there is some import of fresh fruits and juice from neighbouring countries.

#### a) *Passion fruit growers*



The problem with the virus (Passion fruit Woodiness virus) makes it very important to start the growing process with clean and disease free seeds. These seeds are available, sometimes for free (from f.e. RAB, Charitas) coming from Burundi, Uganda. There are even disease free tissue culture plants available.

Traditionally the plant is supported by a branch from a tree and grows like a shrub. The modern cultivation system uses a vertical frame placed in rows to lead the plant. In this system 1650 (2x3 m) plants are planted per hectare, in rows with 2-3 m high wooden trellis construction, so plants can climb into the construction to receive more sunlight, increasing the yield.

For the best start of growing passion fruit 20-30 tons manure per ha is needed. It's very important to use fertilizer in the following years. To keep the crop healthy and increase the yield, applying 8 tons/ ha manure and 500 – 800 kg chemical fertilizer per ha a year gives appealing results.

The first harvest starts 8-9 months after planting (planting starts after 3 months on the nursery bed) and takes 4 months. Harvest period is normally twice a year, particularly in the wet seasons. The yield varies from 2 till 15 tons / ha (average 4,2 tons / ha) depending on the culture system and the maintenance of the crop. There are reports from neighbouring countries that the yield can be further increased by using an irrigation system. The lifetime of the plant is 3 – 5 years.

Passion fruit can be a very profitable crop when it is grown in a proper way. The cost of planting seedlings is approx. 1,35 mln per ha if bought at FAIM. Some growers get virus free plants from Charitas or RAB. The annual input costs (plant, fertilizer, pesticides) are approx. RWF 1 mln per ha ( RWF 70 per kg fresh fruits) excluding labour. Under best practises the production sells for RWF 7.5 mln per hectare. The average price of passion fruit increased the last years because of the virus problems. In 2009 the average price was RWF 350 per kg and at this moment RWF 550 per kg, ranging from RWF 500 to 800 depending on season and quality.

Growers either sell their production on the local market or to a juice processor themselves or are a member of a cooperative and supply their production to this cooperative. In turn this cooperative sells it to the local market or produces it into juice.

Nowadays the main risk in the passion fruit crop is the Passion fruit Woodiness virus. The virus kills the plant and therefore, the plant has to be removed. The main problem is that the disease is only visible during the harvest time. This means that a farmer plants the seeds, invest in the growing process and only at harvest time discovers the harvest is useless. Before planting new plants the soil has to be clean, this can take two years. In 2008 and 2009 this virus attacked mostly large farmers in the Northern Province, but also in other parts of Rwanda.

The NAEB (National Agriculture Export Board) has special kits to test the soil for this virus, if the soil is disease free a new start with 'clean' seeds can be made.

Next to the enormous problems with the Passion fruit Woodiness virus there are some other diseases which can harm the passion fruit crop. Insects can damage fruits and leaves and spread viruses. A fungus harms the leaves. The best way to prevent diseases is to keep the crop healthy by maintaining the plants, using fertilizers and pesticides when needed.

Key issues in growing passion fruit are:

- Passion fruit Woodiness virus free crop
- Use modern growing system
- Use of fertilizer

Key risks in growing passion fruit are:

- Passion fruit Woodiness virus
- Farming practises (yield can be highly affected by insufficient fertilizer applications)
- Climate: too much sun, too much rain, drought

## b) Cooperatives



Growers are often united in cooperatives which vary from 20 to 800 members. Those cooperatives are sometimes united in an union to combine the production of their members before transported to one of the main processors (Inyange and Sina) of passion fruit juice in Rwanda.

Cooperatives perform different roles and provide different services for their members. There are cooperatives that just collect and sell the production to a trader / local market or a processor. Other cooperatives also process the fresh passion fruits into juice. A welcome development for cooperatives is a role in training and advising their members in culture systems and growing passion fruits.

Large processor like Inyange or Sina Gerard would like to sign contracts with more serious growers and thereby undermine the supplies to the cooperatives. At the moment there is a scarcity of passion fruits because the production dropped sharply in the last years because of the virus. Some cooperatives that process the fruits into juice pay their growers a fixed price for their production. In most other situations the price are negotiated between the grower or cooperative and the processor.

A problem for cooperatives is the organisation of proper transport, collection and storage to keep the quality of the fresh fruits.

Key issues for passion fruit cooperatives are:

- The role of the cooperative
- Scarcity of production
- Quality of supply by the members
- No contracts with off-takers

Key risks for passion fruit cooperatives are:

- Lack of market power
- Quality of supply

### c) Processing



Besides the two main processors of passion fruit (Inyange and Sina) there are some local cooperatives that produce the fresh fruits of their members into juice.

At this moment there is not enough supply for the processors and some processors import passion fruit from Uganda or Burundi. The scarcity of passion fruit increased, and almost doubled, the prices. The average price for fresh passion fruit for processing juice is at the moment RWF 550 per kg (high RWF 800, low 500). There are 2 types of products; concentrate and juice. For one litre of pure passion fruit juice 4 kg of fresh fruit is needed. One litre of juice can be processed into 5 litres of concentrate. With 1 litre of concentrate one can make 5 litre of juice by adding water. The average cost per litre pure passion fruit juice is RWF 2600 and the juice can be sold for RWF 3000 / litre. The processors add water to the pure passion fruit juice and pack it for consumption. For example a litre passion fruit juice in a supermarket in Kigali costs RWF 1500. The juice is sold at the domestic market.

The fresh products delivered to the processor are stored, checked on quality and processed. Some processors are willing to arrange the transport to the factory to keep a better quality.

A small size processor with 5 machines can produce 150 litre of passion fruit concentrate per day. The investment for these five machines is RWF 5 mln.

At this moment there are no off-take contracts between growers / cooperatives and processors. The main processors want to have contracts with the main suppliers, but growers / cooperatives are not willing. They expect to get better prices for their products at the local markets. Sina supplies seeds and fertilizer for free to growers to bind growers to them, but the growers are not obligated to supply their fruits to Sina.

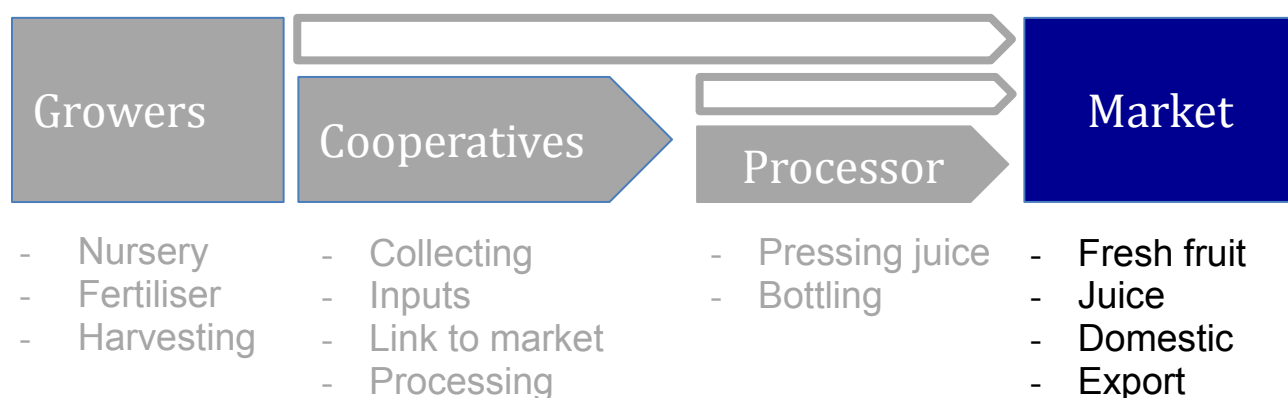
Key issues for passion fruit processors are:

- Availability of supply
- No supply contract between growers and processors
- Quality of the juice

Key risks for passion fruit processors are:

- Comply to hygiene standards
- Quality of juice
- Availability of supply

#### d) Market



The market is divided in the market for fresh fruits and the market for juice.

#### Market for fresh passion fruit.

As mentioned before the average price of passion fruit is increased in the last years because of the virus problems. In 2009 the average price was RWF 350 per kg and at this moment RWF 550 per kg (high price season (Jan.-Feb. and Jul.-Aug.) RWF 800, low price season (Mar.-Jun. and Sept.-Dec.) RWF 500). Before the breakout of the Woodiness virus the market for fresh passion fruit was demanding and for the future the perspectives are still good. The Rwandan passion fruit is known for its good quality and fine taste.

At the moment there is almost no export despite neighbouring countries want to import.

#### Market for passion fruit juice.

At this moment the main passion fruit juice processors don't have any problems to sell their juice. The average cost per litre passion fruit juice is RWF 2600 and it could be sold for RWF 3000. The quality of the juice is still fine, but seems to decrease because of adding too much water, in order to keep the sales price acceptable for the consumers. There is no export of juice and there is some import because the neighbouring countries can produce the juice cheaper.

Key issues for passion fruit market are:

- Strong demanding market
- Quality of juice



Key risks for passion fruit market are:

- Not enough supply
- Quality of fresh fruits and juice
- Import of cheap fruits and juice

### **Financing Needs**

As mentioned before, at the moment of writing this report (October 2012), the actual situation in passion fruit is exceptional. Before the “Woodiness virus crisis” the passion fruit was a cash crop and the expectation for the future is that the passion fruit crop will be a cash crop again. The special purple specie and the fine quality and taste in combination with the good growing circumstances in Rwanda, gives this crop great opportunities. At this moment the financing opportunities are limited due to the extraordinary situation. The production figures, the average prices and track record of growers / cooperatives and processors are not representative. When the situation normalizes again there should be opportunities for Save for a Loan, input finance for growers, raw material collection finance for cooperatives and asset finance for cooperatives and processors.

Raw material collection finance is probably one of the first financing possibilities possible since when the raw material collection is financed the harvest is already done and one can know for sure that the harvest financed is not be affected by the virus.

All financing opportunity in the passion fruit business should be considered on the basis of the cash flow that will be generated.

#### ***a) Save for Loan***

Small scale farmers continue to struggle for the finance they need to increase the yield. Small scale farmers who require finance to buy inputs, are often required to borrow against collateral, which they simply do not have. As a solution BPR has developed a finance solution: Save for a Loan, to provide small farmers a working capital facility. For more information read the product proposal: Agriculture Save for a Loan.

#### ***b) Input finance***

The first harvest is finished after 16 months (including nursery bed) and the first harvest gives less yield than the average harvest of a full-grown plant. Larger passion fruit plantations and more professional growers need input finance for plants, fertilizer, labour and costs of land. The yield of the first harvest is probably not enough to pay the input finance back and to bridge the costs to the second harvest, 6 months later. Therefore, input finance with the possibility of two pay back moments is needed, one after 16 months and one after 22 months.

#### ***c) Asset finance***

For processing passion fruit into juice there are assets needs. At factory level, asset finance requirement can be very significant for buildings and process equipment. A cooperative or processor can also need transport vehicles for



collecting passion fruit, transport to the factory and transport juice to their off takers.

**d) Raw material collection finance**

For more professional cooperatives and / or unions that collect passion fruits from their members to sell them to more important traders or the main processors raw material collection finance is an option.

**4. Strength, Weaknesses, Opportunities & Threats (“SWOT”)**

<p><b><u>Strengths</u></b></p> <ul style="list-style-type: none"> <li>- Suitable soil &amp; climate</li> <li>- Special purple specie</li> <li>- Excellent quality and taste</li> <li>- Strong demand market for fresh fruit and juice</li> </ul>	<p><b><u>Weaknesses</u></b></p> <ul style="list-style-type: none"> <li>- Virus destroyed plantations</li> <li>- Lots of small producers</li> <li>- Low farming skills</li> <li>- Role of cooperatives is limited (no market power)</li> <li>- Only two main processors</li> </ul>
<p><b><u>Opportunities</u></b></p> <ul style="list-style-type: none"> <li>- Total demand is more than total supply</li> <li>- Possibilities to export fresh fruits and juice</li> <li>- New production system</li> <li>- Introduction of tissue culture (free of diseases)</li> </ul>	<p><b><u>Threats</u></b></p> <ul style="list-style-type: none"> <li>- Viruses</li> <li>- Import from neighbouring countries of fresh fruits and juices</li> <li>- Competition on national and international market from cheap juice from neighbouring countries</li> </ul>

**5. Risks**

At this moment the financing opportunities in passion fruit are limited because of the risk of the virus. The only finance option with little risk is raw material collection finance. When the situation after de “Woodiness virus crisis” normalizes there are several possibilities offering financing opportunities in the passion fruit sector. These opportunities will increase when stronger and more important players enter the business.

The risks related to the passion fruit sector financing depend on the stage of the value chain being financed. The tables below summarises the main risks and some of the possible mitigants for each type of financing.

**a) Save for a Loan**

The Save for a Loan system is fully automatic and there should be no need to add extra mitigants next to the normal precautions. See product description.

### ***b) Input Finance***

<b>Risk</b>	<b>Description</b>	<b>Mitigants</b>
Usage	- Risk that the funding is not used for inputs in the agreed manner.	- Financing of only professional growers with a creditable track record. - Pay suppliers of inputs direct - Visit the grower regularly
Performance	- Risk of crop failure / failure to achieve expected yields and quality levels.	- Assume conservative performance figures and based on track record of past years if possible.
	- Climate risk	- Input insurance
Market	- Risk that the grower is unable to sell its passion fruit	- Off-take agreement between grower or the cooperative and trader or processor. - Member of a cooperative and proven success of this cooperative to sell passion fruits.
Price	- Risk that the price of fresh passion fruit is lower than expected	- Off take contracts with fixed price - Possibility to sell to other buyers
Payment	- Risk that the financing is not repaid as agreed	- Repayment should be on basis of payments for fresh passion fruit received from the cooperative or trader through a BPR client account

### ***b) Asset Finance***

<b>Risk</b>	<b>Description</b>	<b>Mitigants</b>
Usage	- Risk that the funding is not used for the assets.	Financing must be on the basis of an invoice of the asset
Performance	- Risk that the passion fruit processor does not achieve expected quantity and quality levels.	- Assume conservative performance figures and based on track record of past years (if possible).
Market	- Risk that the processor is unable to source sufficient fruits at acceptable price  - Risk that the processor is unable to sell its produce at a profitable price (for instance due to cheap imports)	- Supply contracts with large growers or cooperatives - Off-take agreement between cooperative and trader.
Price	- Risk that the price of passion	- Off take contracts with fixed price

	fruit juice is lower than expected	- Possibility to sell to other buyers
Payment	- Risk that the financing is not repaid as agreed	- Repayment should be on basis of payments for passion fruit juice received from the cooperative or trader through a BPR client account

### **c) Raw material collection finance**

Financing solution for cooperatives which have an offtake contract with a reputable off-taker and/or a credible reputation on past records.

<b>Risk</b>	<b>Description</b>	<b>Mitigants</b>
Usage	- Risk that the funding is not used in the agreed manner.	- Financing of only professional cooperatives with a creditable track record. - Payment to cooperatives and growers must be done on BPR accounts and could be checked.
Performance	- Risk that the cooperative is not able to deliver the fruits in the right quality and quantity and therefore does not receive sufficient money for their produce	- Track record of past years in collection and delivery of passion fruits.
Market	Risk that the cooperative is unable to sell its fresh passion fruit	- At present (October 2012) demand is higher than supply, this risk is relatively low - Purchase should be backed by an off-take contract from a reputable party at an agreed quality-related price - Advance rate of X% of the market value to mitigate market risk in case of default of off-taker - Facility only available during the harvest period
Price	- Risk that the price for the fresh passion fruit is lower than expected	- Cooperative should work with an off-take contract - Financing should be based on reliable market price information
Payment	- Risk that the financing is not repaid as agreed	- Payment to cooperatives and growers must be done on BPR accounts