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Section 102, Friday 2:30

AGR1110

Tuesday, December 2, 2015

Peach Trees

Product Information

Product description

Prunus Persica, more commonly known as the peach is native to China. Peaches are grown on trees; the trees bear sweet edible fruit. It is a deciduous tree and grows five to ten meters tall (New world encyclopaedia, 2008). The peach tree is the most widely grown stone fruit; they are grown in temperate zones all over the world. There are many different types of peaches; over one hundred different varieties may go through one grocery store alone in a season. The different types have different looks and attributes (HMC, n.d.). The peach provides nutritional value for humans, for example, vitamins C and A, Potassium, Magnesium and Iron. It also is a good source of dietary fibre while low in calories. The peach has a single large seed surrounded by the fleshy, edible fruit.

How grown, raised, processed

Peach trees live for about 20 years. It takes between 2-4 years of growth before the tree starts producing fruit, and years 4 through 8 are the tree's peak production time (HMC, n.d.). Peaches are typically grown in full sun exposure preferably in a sandy soil type and with a soil pH of slightly acidic to neutral. Certain species of peach tree thrive in specific climates. Table 1 is a chart of the physiographic regions of Nepal that shows the areas most suited to peach productions.

Table 1. Characteristics of Physiographic Regions of Nepal

Features	Terai	Siwaliks	Middle Mountains	High Mountains	High Himal
Land Area (Million ha)	3.1 (44%)	2 (12.7%)	4.4 (29.5%)	2 (19.7%)	2.4 (23.7%)
Geology	Quaternary alluvium	Tertiary sandstone, siltstone, shale & conglomerates	Phyllite, quartzite limestone and islands of granites	Gneiss, quartzite & mica shists	Gneiss, schist, limestone and Tethys sediments
Elevation	100-300 m	200 - 1500 m	800 - 2400 m. Relief 1500 m with isolated peaks to 2700 m	1000 - 4000 m High relief 3000 m from valley floor to ridges	2000 to 5000 m +
Climate	Tropical	Tropical, subtropical	Subtropical, warm temperate (but tropical in lower river valleys; cool temperate on high ridges)	Warm to cool temperate, alpine	Alpine to arctic (snow 6 - 12 months)
Moisture Regime	Subhumid in FW+MWDR; humid in W+C and FDR	Subhumid in most of the area; humid in N-aspect of W+C=EDR and Dun Valleys	Humid; perhumid above 2000 m	Subhumid to perhumid	Semi arid behind Himal
Rainfall Intensity	High	High	Medium	Low	Low
Horticultural crops	Mango, lychee pineapple, jack-fruit, potato, tomato	Mango, papaya, banana, potato	Mango, papaya, banana, orange, lime, lemon, **peach** plum, nectarine, persimmon, Asian pear, potato, cauliflower	Chestnut, walnut, apple, **peach**, plum, apricot, cherry, almonds, potato	

When bought from a nursery the trees bloom in the summer. Nitrogen fertilizer is required throughout the tree's development to produce the best results. Specifically in the tree's first three years it needs about a pound of nitrogen fertilizer once a year in the spring. Also in the developing stages of the tree, it needs to be pruned, to remove some of the shoots, and branches so the tree produces less fruit at a better quality (The Old Farmer's, n.d.). With the proper fertilizer and pruning the tree can grow 10-18 inches more each season. This care also helps with the prevention of certain pest and diseases such as Brown Rot, and Gummosis. According to table 2, it appears that there are two distinct growing seasons for peach crops, May to September and April to August. The proper care of the trees during this time will ensure a healthy crop for many years.

Table 2. Method and Time of Propagation

Fruit Crop	Propagation Method	Time
Apple	Bench grafting (Whip and Tongue)	January/February
Pear	Bench grafting (Whip and Tongue) Budding (T or Chip)	January/February May/June
Peach, Plum, Apricot, Cherry	Tongue or cleft grafting (in situ) Shield Budding	May to September April to August
Persimmon	Chip Budding	January/February

When the fruit has developed on the tree it should be picked when it is fully ripe (The Old Farmer's, n.d.). As indications of when the fruit is ripe, one should look for: easy removal from branch, no green colour, yellow in colour, not very hard to touch and not to soft or wrinkling of the skin (Driver, 2014). The time for harvest depends on many factors. Most commonly the harvest time is towards the end of summer, but the best way to tell is to test the peach and look for the indicators mentioned above, to see if it's ripe. When harvesting, there is a rather small window of time to pick the fruit when it is perfectly ripe and it not be immature or overripe; and if picked at the wrong time the peach could lack flavour, juiciness, texture, and sweetness (Grant, 2014). Once all the peaches are harvested the next step is to store them. If the peach is picked and it is still under ripe it should not be stored in cold storage, but if the peach is at the desired ripeness then cold storage is necessary (The Georgia Peach Council, 2015). Being a fruit, the peach does not last very long in storage, so some alternatives to storage would be to use all the peaches that the tree provides by canning or freezing them, making jam or even cooking with them so as not to waste product.

Labour Required

Peach production requires a lot of labour and many hours of work. With a peach orchard there is little need or often no need, for the use of equipment. During the summer months the orchard will need to be cared for in the prevention of pests as well as thinning the trees. Apart from the time the fruit needs to be harvested, all the labour that is required can be done by a few people, depending on the size of the orchard (Crassweller, Kime & Harper, n.d.). To start the orchard the land should be prepared like any other crop. Ploughing the ground and trying to make it as even as possible is important for even water distribution. The land should also be weeded and broadleaf field crops should not have been grown on the land prior to the orchard. If possible, the soil should also be tested to ensure the land will provide the needs of the trees with respect to nutrients (Crassweller et al. n.d.). When planting, the trees should be in rows to allow easy access to the plants, even distributions of resources, so weed are more visible and this will allow for the potential for intercropping (Raizada, 2015). After the initial work of planting the trees, they then have to be cared for. The application of nitrogen fertilizer is essential in the first years of the trees' development. The fertilizers that are essential when caring for a peach tree are: nitrogen, phosphorus, potassium, calcium, boron, copper and zinc (Crassweller et al. n.d.). Once a tree starts to produce fruit it then needs to be thinned which can require a lot of time, seeing as it is a task that is done by hand. When the fruit is very small and just starting to develop someone needs to go and remove all the smaller less developed fruit around the larger one to allow for its full development (Gurney's Seed, 2010). Pruning also requires labour to remove the branches not producing as much fruit or when they are blocking other branched from sunlight. When it comes to harvesting the trees it depends on how many trees are in an orchard to how many people will be needed. Many people are needed for two major reasons, first, the time

frame in which the peaches are ripe is very short so it is possible many if not all of the trees would need to be harvested around the same time, and the second reason is that all the peaches on a tree may not be ripe at the same time so one tree may need to picked multiple times at different times in the harvesting period. After the peaches have been harvested they need to be cared for in the sense that they should not be bruised or damaged (Crassweller et al. n.d.). Even if family labour is available it might not be enough to get the job done in the time it needs to be so extra help may be necessary. Peach harvest is very time sensitive.

Health Benefits

Peaches provide a lot of very beneficial nutrients such as, vitamins A, C, B, and E, folic acid, potassium and many others. All of these can benefit people and all serve a different valuable purpose. It's been found that stone fruits like peaches have the potential to fight off diseases such as diabetes and cardiovascular disease. The fruit's bioactive compounds work with the different compounds of the disease (Phillips, 2012). The vitamin C the peaches provide can also help with the prevention of the formation of the free radicals known to cause cancer. Another way the vitamin can help is when the peaches are eaten or applied topically can help fight skin damage from the sun and pollution (Ware, 2015).

Nutrition Facts

Serving Size 1 Large Peach (175g / 6.1oz)

Amount Per Serving	
Calories 68	Calories from Fat 4
	% Daily Value*
Total Fat 0g	**1%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrates 17g	**6%**
Dietary Fiber 3g	**10%**
Sugars 15g	
Protein 2g	

Vitamin A 11%	•	Vitamin C 19%
Calcium 1%	•	Iron 2%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300mg	375mg
Dietary Fiber		25g	30g

During pregnancy the vitamin C that peaches can provide is necessary to aid in the baby's development such as: the formation of bones, teeth, and connective tissue in the skin, cartilage, muscles and blood vessels. Vitamin C also helps the mother absorb other important nutrients such as iron, during her pregnancy. During early pregnancy folic acid is very important for the initial development of the baby. The potassium the peaches provide is very beneficial to the mother because it helps prevent fatigue, muscle cramping and anxiety (Woods, 2015).

Benefits to Canada

Although the benefits to the Canadian economy or agricultural community are not extensive and or extremely beneficial they are still important to note. By supplying the initial saplings the nurseries are making a profit, which in turn improves their business, which would allow them to expand, and possibly become a bigger operation and become well known. With the Canadian nurseries becoming bigger and making more of a profit that helps that Canadian government and also potentially increase exports. The proposal also includes, that Canada supplies some experts involved in the peach industry that can provide knowledge and experience to the Nepalese so they can become knowledgeable of how to begin and continue the process. Students would also be a great resource that Canada could supply that would not only help the people in Nepal but also provide a great learning experience for the students. From 1960 to 1973 stations were set up across Nepal and deciduous fruits were introduced but didn't last for multiple reasons and one was lack of training for farmers (Devkota, n.d.).

Nurseries

There are two nurseries that are going to be supplying the peach trees, both are rather small nurseries but by getting products from both would allow them to fill the order. The first nursery is located in Wellesley, Ontario, Canada. Silver Creek Nursery is dedicated to providing

young trees for people to start backyard orchards. Silver Creek can supply multiple different types of peaches, but the most popular one would be the Redhaven. Redhaven peaches are good for both canning and fresh eating and are sold for 35.50 dollars in Canada (Silver Creek Nursery, n.d.). The peaches that Silver Creek would be providing would be best suited for the warmer locations for growth. The other nursery providing the trees Green Barn Farms located Notre-Dame-de-l'île-Perrot, Quebec, Canada. This nursery started as a family business, and has been a business for about 40 years now. The fruit from this nursery has been bred and selected so that it can resist bitterly cold Canadian winters down to -40 C, so with this alteration the trees from this nursery would be able to grow in colder climates. Due to these alterations the price of these trees are more than the other nursery, a peach tree from this nursery is 40 dollars Canadian (Green Barn Farms, 2014).

Market opportunity

This product is very versatile in the sense it can be used in many different ways. Not only can it be eaten plain just off the tree, but it can also be used in all sorts of cooking, baking and preserves. The peaches can also be canned and eaten in the seasons when the tree is not producing; they can also be made into jams. So with these potential multiple uses, peaches are not limited to be sold at a market but also to restaurants to be used in cooking, health food stores, to be sold in bulk so families or business can make jams out of the peaches. There is also the potential to open a storefront at the orchard so people can come and buy their peaches right from the source. The orchard could also open during the harvesting season so people and tourists could come and pick their own peaches.

Export Potential to Nepal

Proposal for Nepal

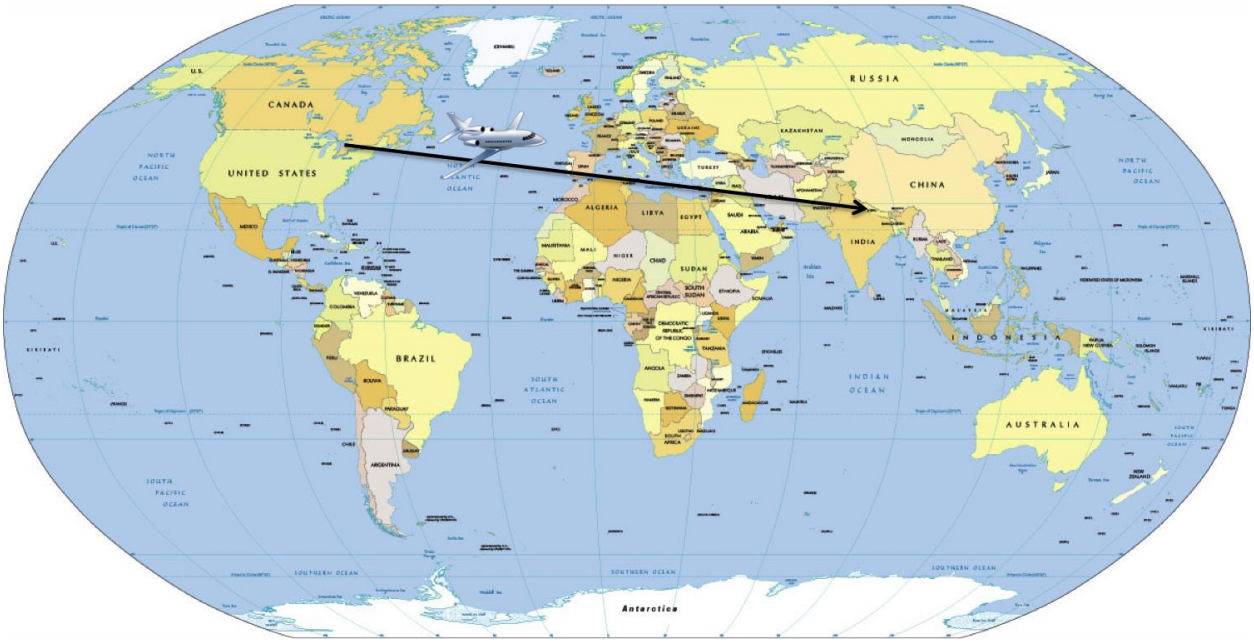
Canadian nurseries would supply 50 peach tree saplings would then be sent to Nepal. When the sapling peach trees get to Nepal there is potential to start an orchard that could then be used to provide peaches for sale as well as the propagation of young trees. The peaches could be sold at markets for consumption in more populated locations. The orchard could also provide young trees for sale that a village could come together and buy that could supply peaches to the whole village for years. An ideal location for the orchard to start production would be in an area called Pokharitar, it is only about an hour drive from the regional airport and there is lots of land upon which the trees can be grown.

Transportation

The trees should be ordered a least one year before the orchard is to be started (Crassweller et al. n.d.). So when the trees are ready to be sent to Nepal a few things need to be considered. First, sending them by plane will be much faster and since the trees should be planted sooner rather than later that faster they get to their new home the better. The young trees also need to be kept in cold storage (but frost free) while being transported, as well; the roots need to be kept wet and can't ever be allowed dry out (Keepers Nursery, n.d.).

The process would begin with the trees being picked up by a refrigerated truck from Green Barn Farms, and then Silver Creek Nursery. From there on to Toronto International Airport. A refrigerated Ryder truck can be rented from Toronto for a day and it would cost 189.95 dollars Canadian (Ryder, n.d.). The truck would be driven from Toronto, ON to Notre-Dame-de-l'île-Perrot, QC, then to Wellesley, ON then to the Toronto airport in about 16 hours total; so one-day rental would be enough. Once at the airport, A1 Freight Forwarding would be used to fly the

trees to Kathmandu Nepal, it would cost approximately 300 hundred Canadian dollars (A1 Freight Forwarding, n.d.). The flight would take about 19 and a half hours from airport to airport so before the fight the tree's roots should be soaked and kept in the coldest area possible. When the shipment arrives at Tribhuvan International Airport, in Kathmandu, Nepal they then need to be trucked to the location for the orchard as quickly as possible so they have the greatest chance at survival.



Storage

In the case of Nepal, many of the peaches produced will be sold in a market most likely not far from the orchard they are grown in, so the peaches will be picked when they are ripe and need to be sold soon after they are harvested. If available, the peaches that are picked when they are ripe, can be stored in a cold place and last for 2-4 weeks (Crassweller et al. n.d.). If the peaches are being transported any distance after being picked they will be harvested slightly before they are totally ripe. The timing of the harvest of the peaches depends on how long they can last in storage, but ultimately the less time spent in storage the better.

Cost analysis

To get the peach seedlings to Nepal would cost 2,408 dollars in Canadian dollars and that's just purchasing the trees, trucking them to the airport and then the plane transport overseas. If the farmer were to pick the trees up him/herself from the airport it would save the cost of shipping it to the farm. So if the farmer picked up the trees the total for each tree would be $48.15 Canadian, which would be 3,838.02 Nepalese Rupee. If the farmer bought all 50 trees to start his orchard he would be paying 191,940.61 Nepalese Rupee. With this total most, if not all Nepalese farmers could not afforded to start a peach orchard with the supply coming from Canada. The only way that would be a reasonable scenario, would be a grant from the Canadian or Nepal government to start production, or even some sort of loan for the farmer.

Needs and Benefits

One very important reason peaches should be a staple crop in Nepal is the nutritional benefits to young children, pregnant women and developing foetuses. Nepal is one country where the life expectancy of women is lower than that of men and the highest risk group for poor health is children under the age of five. Reproductive issues both maternal and perinatal dominate the overall pattern of morbidity in Nepal (Deslich, n.d.). During pregnancy the vitamins and other nutrients the peach possess is very valuable. A different type of benefit is the possible addition of an alternative crop.

The way the orchard would be set up with the trees in rows, there is the opportunity to grow a cover crop while the trees grow. Grasses are the most common cover crop used in orchards and by growing the grasses it helps the tree with floor management, soil structure, reducing erosion, increase nitrogen levels and encouraging water infiltration (Lui et al., 2011). It also benefits the farmer because the grasses can then be used for livestock feed or other usages.

Producers and Buyers

Fruit production, especially the deciduous type, is not traditional in Nepal, and because of that it is limited. Peach trees are in scattered locations but have very little commercial value (Devkota, n.d.). A farmer from Nepal would be the one to start and then run the nursery. It would be beneficial if it were a family operation that way little to no extra labour may be required while the orchard is still small and staring out. Depending on the location of the orchard the buyers could be limitless, if the orchard is near roads and a large population that allows a larger market. The peaches could be sold in stores or just in a farmers market. If the people of Nepal understand how beneficial the peaches can be, then they will come and buy them. There is also a market for the saplings of the trees so that a household or a village can purchase a tree. By selling the trees to individuals, or a groups of people it allows remote villages or families who don't have access to stores a way to grow their own fruit, and one tree has the potential to be shared by many.

Marketing

The best time to market the peaches is at the start of the harvest time to shortly after harvest has concluded (Crassweller et al. n.d.). When the product is being sold, to ensure the customers return and continue to purchase the product, one must be sure the product being supplied is of the best quality (Crassweller et al. n.d.).

One very important step that needs to be taken when marketing peaches it to make sure the people of Nepal know how nutritionally beneficial they are. Kalimati Fruits and Vegetable Market is a wholesale market in Nepal where many people sell their product and many consumers come to shop. This is where many farmers go to market their agricultural produce,

especially, vegetables and fruits in the Kathmandu valley. Kalimati Fruits and Vegetable Wholesale Market was set up by the Department of Food and Agriculture Marketing Services (GOV of Nepal, n.d.). So this location would be an excellent location to sell the peaches grown in the orchard. 27 percent of the fruits and vegetables that are sold in markets in Nepal are imported from India (Fresh Plaza, 2015). With Nepal being a very agriculture based society more of the food sold and eaten there should be locally grown which would not only cut costs of imports but also increase the farmer's livelihoods.

Documentation

The Canadian government has enacted *The Plant Production Act,* S.C. 1990, c.22, *The Plant Protection Regulations,* SOR/95-212 and the *Canadian Food Inspection Agency Fees Notice, Canada Gazette: Part 1.* These are in place to test trees for viruses and other virus-like organisms because that is the main issue when exporting and importing fruit trees (Canadian GOV., 2011). The Canadian Food Inspection Agency (CFIA) can certify fruit stock for export and they have charging fees in accordance with the *Canadian Food Inspection Agency Fees Notice* (Canadian GOV., 2011). The plant production fees are illustrated in table 3.

Table 3

Item	Column 1 Service, Right, Product, Privilege or Use	Column 2 Fee
Inspections of things presented for export	(1) Subject to subitems (3) to (5) and for the purpose of section 55 of the Regulations, for an inspection of a thing presented for export under section 7 of the Act	
	(a) for seeds of fruit trees, trees, shrubs and field crops, and for grain and grain products	$15 per lot

Global Competition

There are many countries that not only sell the same peaches for a cheaper price but are also located closer to Nepal. Peach trees are native to China so acquiring the trees from china would be a much more logical solution. If the trees were to come from another country in Asia the tree would already be much more adapted to the climate and pests from that area. Apart from the countries that could provide the trees right from Asia there are nurseries from the United Kingdom that sells trees for around the same price but the shipping cost would be less. Van Meuwen is a nursery in Lincolnshire, UK that could provide the peach trees (Van Meuwen, n.d.). The biggest competition from North America is the United States from states like Georgia (Peach State) and Florida where peaches are some of the most popular crops. Willis Orchard Company located in Cartersville, GA also would have been a more affordable producer because they sell their peach trees for less than 10 American dollars. Nepal will not, in the foreseeable future, be in any way a global competitor in this product. Peaches from Nepal will benefit the local economy and overall health of the population but not be competitive globally.

Conclusion

The proposal to send peach trees from Canadian nurseries to Nepal to enable Nepalese farmers to start their own nursery or orchard has too many issues to be a viable proposal to benefit Nepalese agriculture. The price is one of the more significant issues with the idea; the average person in Nepal does not make enough money to buy the product from the farmer in Nepal at a price that would allow the farmer to make a profit. Although peaches may be a beneficial crop to the people of Nepal, there are many other, more realistic options of going about starting a peach orchard that would be much more advantageous to the people of

Nepal. Following all the same steps of starting the orchard just changing the origin of the trees would make more sense. To arrange to have the saplings imported from somewhere in Asia, say neighboring China where the peach tree is a native deciduous fruit bearing tree, would be more cost effective and more likely to have a favourable outcome for the farmer and Nepalese people.

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Visuals
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