



RURAL INDUSTRIES RESEARCH  
& DEVELOPMENT CORPORATION

# **Buckwheat**

## **A Demand-Supply Analysis**

**A report for the Rural Industries Research  
and Development Corporation**

by Grant Vinning  
Asian Markets Research

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# Foreword

The consumption of buckwheat in Australia is minuscule. The bulk of that consumption is from expatriate Japanese living here and the few Australians who have enjoyed buckwheat noodles in Japan and have gone to the effort to find either a Japanese store or a Japanese restaurant. Australia does produce buckwheat: it is grown in Tasmania, Victoria and New South Wales. Under no conditions could buckwheat be considered a major crop. The vast bulk of Australia's production is exported.

It is exports that are the key to the Australian industry. Japan imports approximately 100 000 t annually. Japanese imports are overwhelmingly from China, Canada, and the United States. Whilst Australia is in the third tier of suppliers to Japan, its prices invariably attract a premium of around 100 percent greater than the next highest priced supplier.

Buckwheat production in Australia is underpinned by research centred on Ballarat. Support for the research comes largely from RIRDC and Victoria's Department of Natural Resources and Environment.

In order to assess if this support should continue, RIRDC undertook a world demand - supply analysis. At the same time it was considered that if the prospects for the industry appear sound then other organisations might be encouraged to support the industry in its efforts to reach critical minimum mass.

This project was funded from RIRDC Core Funds which are provided by the Federal Government.

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# Executive Summary

World market prospects for buckwheat appear to be firm.

This conclusion is drawn from analysing world demand and supply.

World demand for buckwheat, as expressed through world trade, is based on annual imports of approximately 100 000 tonnes into Japan.

In Japan, buckwheat is consumed nearly solely as *soba* noodles.

Noodles are maintaining their position in the Japanese diet although it would be better to refer to this as the Japanese life style. Even though expenditure on eating-out has declined, the composition of noodles in total eating-out expenditure is being maintained. *Soba* is maintaining and even marginally increasing its popularity. More *soba* is consumed eating-out rather than as eating-in.

The diversity of eating-out outlets serving *soba* is a bonus. Low end cheap and convenient *soba* shops will continue to grow as the Japanese life style continues its hectic pace. High-end shops in Japan, as well as elsewhere, seem impervious to economic conditions. Economic recovery will be positive impacts upon both ends and will be gratefully received by the middle type of shops.

Growth will be in the fresh market. Developments in freezing technology will see the growth in boiled and then frozen products. This augers well for both the eating in and eating out markets.

Throughout the world, enough evidence exists that buckwheat utilisation is stuck in its traditional uses mode and is not being used to its full potential. This new potential is based upon buckwheat's health enhancing properties of high protein, virtually gluten free, and high amino acid content. It is for the reasons of simple extension to existing product lines as well as potential in totally new areas that one must be optimistic about the future demand for buckwheat away from just the *soba* market in Japan.

From the supply perspective, Japan also is a producer, albeit a small one in world terms. The conclusion is that domestic production will trend downwards. The reasons for this are equally applicable to all aspects of agriculture in Japan, viz, economies of scale on small farms and the resulting problems of mechanisation, the aging farming population, and an elaborate and convoluted distribution system that results in prices of the end-product encroaching on the price tolerance of consumers. This distribution-induced price intolerance encourages those in the distribution chain to switch to cheaper alternative of import. In addition, Japanese millers' insistence on quality as defined by the nebulous and highly subjective concept of *fumi* or "mouth feel" does not encourage farmers to continue with buckwheat production.

Japanese imports of buckwheat will flatten out but there will be still be growth. Chinese imports will be important as they place downward pressure on high priced suppliers. In analysing the import data, it is difficult to equate price with supply with imports. The best time to export to Japan in the period from October to December.

Japan's biggest supplier is China and China's biggest market is Japan. The result is a situation of mutual interdependence: Japan needs China as a supplier and China needs Japan as a market.

Japan claims that China's quality has improved in recent years. This would appear to be based on company – to - company assistance rather than country - to – country assistance. The claims of improved quality are certainly not reflected in higher prices.

Chinese exports appear to have peaked and that further growth in the rate of expansion will be slow. The main reasons given for this are very much internal to China. They relate to the growth in internal demand and improvements in logistics' infrastructure that will encourage greater internal movement between north and south rather than the east-west orientation that has encouraged exports. With Chinese exports slowing down, Japan may have to start looking elsewhere for suppliers.

Other suppliers to Japan are Canada and the United States.

Canada has lost market share to China. Indications are that Canadian production will continue its downward production trend, endangering its supply position to Japan. However, Canada is the home of the world's leading buckwheat research organisation. This gives Canada a marked advantage in plant-based technology. In addition, Canada has the ability through silo insulation and its lengthy and bitterly cold winter to store buckwheat through into autumn. This appears to be an advantageous time to supply the Japanese restaurant sector.

The third large supplier to Japan is the United States. It is considered that the United States will start to leave a gap in the market with regard to supplying Japan. The driving force here is the development of the PL 480-aided market. This is opening up the market to supply buckwheat into the traditionally heavy consumers of buckwheat in the former Soviet Union and the Slavic Eastern European countries. Increasing domestic demand in the United States for non-traditional uses of buckwheat will see domestic production increasingly supplying local demand. The breeding of special varieties with specifically enhanced attributes will help drive the move towards a greater diversity away from traditional markets.

Australia is the smallest of the regular suppliers to the Japanese market but by far and away the highest priced supplier. The only three months that Australia has consistently supplied over the past six years – June, July, August – appear to be the preferred months to supply the restaurant trade in Japan. Australia does have a poor image problem associated with poor drying and post-farm handling but despite this it does appear to well positioned.

Buckwheat is produced in significant volumes in the Russian Federation, Ukraine, Poland, and France. Production has nearly always been to meet local demand. It is considered unlikely that this will change. If anything it is considered that these countries will become importers rather than exporters.

# Introduction

The basic facts regarding buckwheat are sufficiently well known as to be just paraphrased here:

- Buckwheat is a native of temperate east Asia, and has been cultivated in China and Japan well before AD 1000.
- It has proven to be widely adapted in North America and Europe.
- Buckwheat was brought to North America by the early European immigrants in the 17th century.
- The crop matures in a relatively short period of time - 70 to 80 days. Not being related to wheat, buckwheat makes an excellent rotational crop with cereal grains.
- The basic products produced from buckwheat are flours of a number of different grades, *farinetta* or buckwheat bran, groats or hulled whole buckwheat kernel, and grits or hulled broken kernels that is the coarse granulated product made from groats.
- Buckwheat has been traditionally used as flour for pancake mixes in North America.
- In Europe buckwheat has a far wider use, being combined with wheat flour for the making a bakery products, and in a raft of “ethnic foods”. The consumption of buckwheat as *kasha* or roasted buckwheat is common where there are people of Eastern European extraction.
- In Japan, buckwheat is milled into flour for use in *soba* noodles, the omni-present dish of the country.
- Buckwheat is an extremely high source of quality, easily digestible protein, a high level of essential amino acids, and a good source of mineral components. It is relatively high in potassium and phosphorus. Buckwheat contains vastly more vitamin B than wheat.
- Apart from being gluten free, buckwheat’s chemical composition gives it the potential to lower the symptoms of diabetes and lower blood pressure, and reduce cholesterol count.
- Buckwheat hulls are finding an increasing market as a non-allergenic filler for pillows and futons.
- Buckwheat has a market outlet in animal feeds where lysine supplements are low or non-existent.

At the heart of this paper is the need to view buckwheat from Australia’s perspective.

Australia is neither a traditional buckwheat consumer nor producer. However it has plans to be a supplier of note, having grown the product for a number of years. Nearly all of this is destined for the export market. Hence, there is a need to concentrate on world demand and world supply.



From that perspective then this paper examines the world trade in buckwheat. This can be narrowed down to the simple proposal that the centre of world trade is Japan's annual imports of around 100 000 t.

The paper examines in details the two parameters of the Japanese trade:

- Identifying factors affecting demand for buckwheat in Japan.
- Identifying factors affecting supply. This concentrates on China, Canada and the United States.

As part of the demand analysis the paper also looks at the potential to expand the use of buckwheat beyond its current traditional human food and stockfeed applications.

This paper does not venture into agronomic details. It considers that there is adequate information available on this area. It is very conscious in the many references regarding buckwheat, more than 90 percent is devoted to production-based issues. "Economics and marketing" are scantily covered. This paper concentrates on that gap.

The methodology in analysing the world demand – supply situation for buckwheat was relatively straightforward. That is, undertake a quantitative analysis of the available statistics and then subject the various hypotheses that come from the quantitative analysis to qualitative examination by interviewing members of the trade, government officials, and academic and private sector researchers.

# Demand - Japan<sup>1</sup>

Buckwheat is consumed in Japan nearly solely as *soba* noodles. This paper will adopt the practice of referring to the whole grain<sup>2</sup> as “buckwheat” and the noodle as *soba*.

Since *soba* is synonymous with noodles, it is first necessary to examine Japan’s noodle industry before moving into the details of the *soba* noodle.

## Demand – Japan – All noodles

Noodles are probably Japan’s most commonly consumed food. They are ubiquitous in the form that they are presented and in the manner through which they can be consumed.

They are presented as:

- Fresh / Dried.
- Instant.
- Machine made / Hand made.
- Pre-cooked.
- Hot / Cold.
- Thick / thin.
- Flat / round.

They are available through

- **Retail sector**, from the largest and most prestigious department store to the smallest “Mom and Pop” store.
- **Food service sector**, from the most expensive restaurants to the crudest stand-up shop.

They are sold in summer when they are considered to be a cooling meal and in winter when they are viewed as a warming food.

These noodles are produced by over 2000 noodle manufacturers. Whilst noodle consumption and production is eons old in Japan, some of the current manufacturers are moving with the times. They have mail order facilities – some even have web sites and e-commerce. This augers well for the home market.

Statistically<sup>3</sup>, the term “noodle” embraces

- Non-dried noodles and spaghetti.
- Dried noodles and spaghetti.
- Chinese noodles.
- Instant noodles.
- Others.

Composition of the types of noodles has changed over the twenty years 1979 to 1999, Fig. 1.

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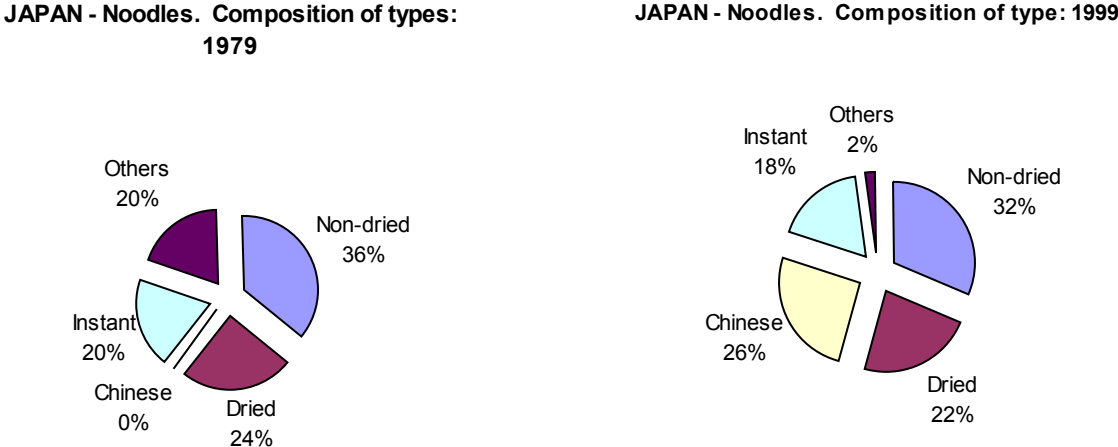
<sup>1</sup> This section benefited from comments and details provided by John Oakeshott of KIMJOK (Japan).

<sup>2</sup> It is understood that buckwheat is not a cereal grain but strictly speaking a fruit. However, the term “grain” is an easy method of referring to buckwheat.

<sup>3</sup> As defined by the Annual Report of the Family Income and Expenditure Survey of the Statistics Bureau, Management and Coordination Agency. Figures 1-3 are drawn from this data set.

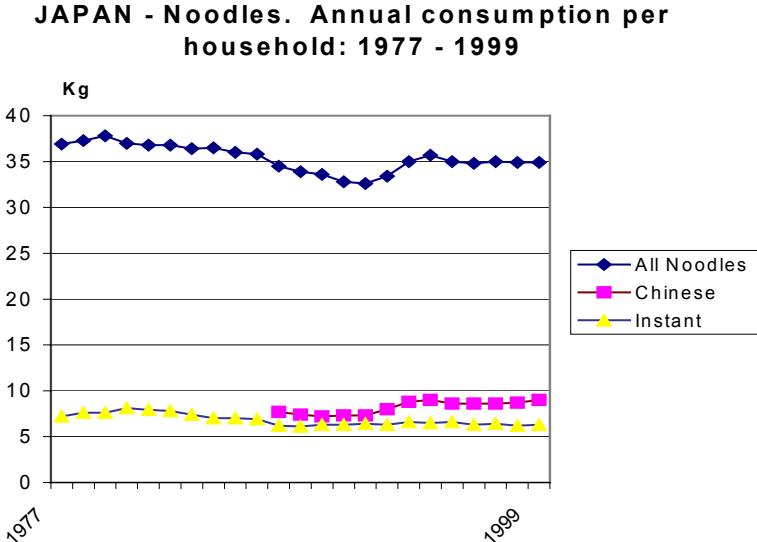
Whilst the major forms of “dried”, “non-dried”, and “instant” have basically stayed the same, the big changes have been in the relative roles of the Chinese noodle and the “Others”. However, not too much should be read into this as it could merely represent a change in definitions.

**Fig.1**



Yearly expenditure per household<sup>4</sup> on “noodles” has declined marginally over the period 1977 – 1999, see Fig. 2.

**Fig 2**

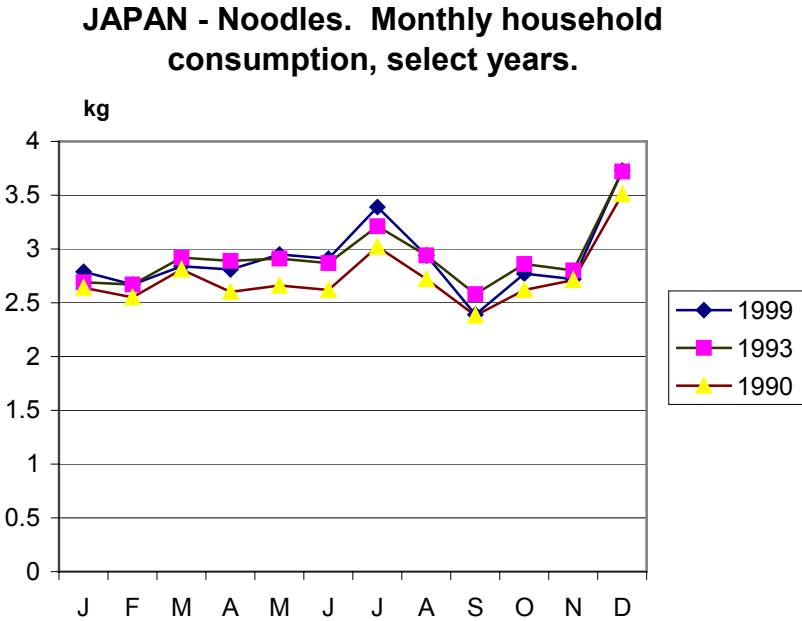


<sup>4</sup> Defined as “All Households, Workers’ Households”

It is noticed that the consumption of Chinese noodles has risen 20 percent over the period for which data are available.

What has remained constant is the monthly pattern of household purchases of noodles. Fig.3 shows that over the ten years 1990 – 1999 household consumption drops from mid-summer, bottoms out in early autumn and then rises to a year-high peak in December.

Fig. 3



**Demand – Japan - Traditional noodles**

Japan has a number of traditional noodle forms. The three major forms are:

- *Soba*
- *Ramen*
- *Udon*

▪ **Soba**

*Soba* is made from buckwheat and wheat flour. Buckwheat flour is considered too strong a flavour to be used 100 percent in *soba* noodles. As a result it is blended with wheat flour, usually in the ratio of 40:60.

*Soba* is served in two basic styles: hot *kake-soba* and cold *mori soba*.

Four forms of *soba* are shown below.

- *Kitsune* is where the *soba* is served with the noodles swimming in hot broth with chopped spring onions and fried tofu. *Kitsune* can also be served with *udon*.

- ❑ *Tanuki* is similar to *kitsune* is served with fried tempura batter.
- ❑ *Mori soba* is eaten cold after being dipped in a soy-based broth. The *soba* is swerved on a bamboo rack in a lacquer box. The broth comes separately along with the small serving of chopped spring onions and horseradish *wasabi*. These are mixed with the broth and the *soba* dipped into the broth. *Mori soba* is only made with *soba*.
- ❑ *Zaru soba*. The same as *mori soba* but served with thin strips of dried seaweed. Again, only made with *soba*.

- **Ramen**

Also called Chinese noodles. In western Japan they are called *chuka soba*.

*Ramen* are made from wheat flour, egg, salt and *kansui*, a form of mineral water. *Ramen* are yellowish in colour. They are boiled and served in a hot soup made from pork or chicken bones accompanied by, variously, boiled fish paste slices, spring onions, and spinach, a pickled form of bamboo shoots, and grilled pork.

Variations are common. Three are:

- ❑ *Bata-ramen* that is a very simple dish of *ramen* served in a miso soup and a knob of butter.
- ❑ *Chashumen*. Slightly more elaborate, the dish is *ramen* served with slices of grilled pork brushed with soy sauce.
- ❑ *Hiyashi-chuka* with the *ramen* served cold with a series of vegetables and meats that have been cut into strips and accompanied by a sweet vinegary sauce.

- **Udon**

*Udon* are made from wheat flour. They are quite thick and can be either round, flat or square in cross section. *Udon's* outstanding attributes are its whiteness and its softness.

- ❑ *Tsukimi* is a dish of *udon* noodles served in a hot broth with a raw egg broken over the top.
- ❑ *Tempura udon* has two deep fried battered prawns laid on a bed of *udon* or *soba* and served in a bowl of hot broth.
- ❑ *Kamo namban* is a chicken placed on *udon* or *soba* in hot broth along with large slices of spring onions and Chinese lemon. Ironically, *kamo* means “duck”.

Other common traditional noodles are:

- ❑ *Hiyamugi* Also known as “ice noodles”. *Hiyamugi* is thinner than *udon* but thicker than *somen* noodles. The essence of *hiyamugi* is that they are served cold. After boiling, they are rinsed in cold water, served with ice, and eaten after being dipped in cold broth.
- ❑ ***Kishimen***. Similar in taste but flatter in shape than the *udon* noodle. Their relative popularity in dishes cooked at the tables and in dishes that require long cooking times such as casseroles and winter soups is that they do not become soggy.

- ❑ Somen: Somen are one of the thinnest noodles. They are made from wheat but variations such as tamago somen made with egg yolk and green tea somen are becoming increasingly common. Whilst available in the fresh form, somen is usually available in the dried form. They are usually served cold after briefly being boiled and rinsed in cold water. Served with a chilled dipping broth.

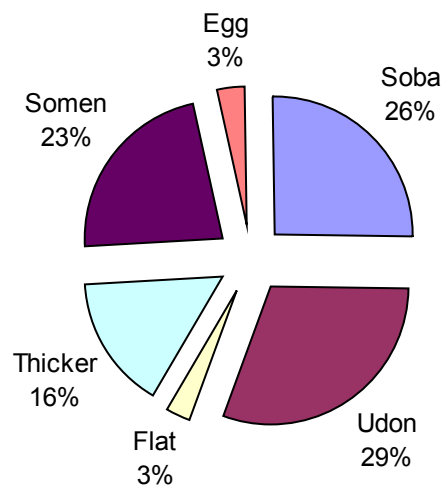
Aficionados prefer *tenoba somen* or hand stretched. These are considered to less oily compared with the machine stretched product.

- ❑ Yaki soba: Despite the name, yaki soba is not actually soba. Instead, it is steamed Chinese noodles mixed with stir-fried vegetables and pieces of meat. The ramen can be served in the soft form when the noodles are cooked with the other ingredients and the hard form when the noodles are cooked separately from the other ingredients.

Fig.4 shows the major forms of noodles.

**Fig. 4**

**JAPAN - Noodles. Market share, 1999**



*Soba* has a healthy 26 percent of the market for the traditional form of noodles.

Traditional noodles can be either machine made or and made. As Fig.5 shows, the machine made type proliferate. There are about 300 manufacturers of machine made *soba* in Japan.

Fig..5

**JAPAN - Noodles. Market share, machine and hand made: 1994-1999**

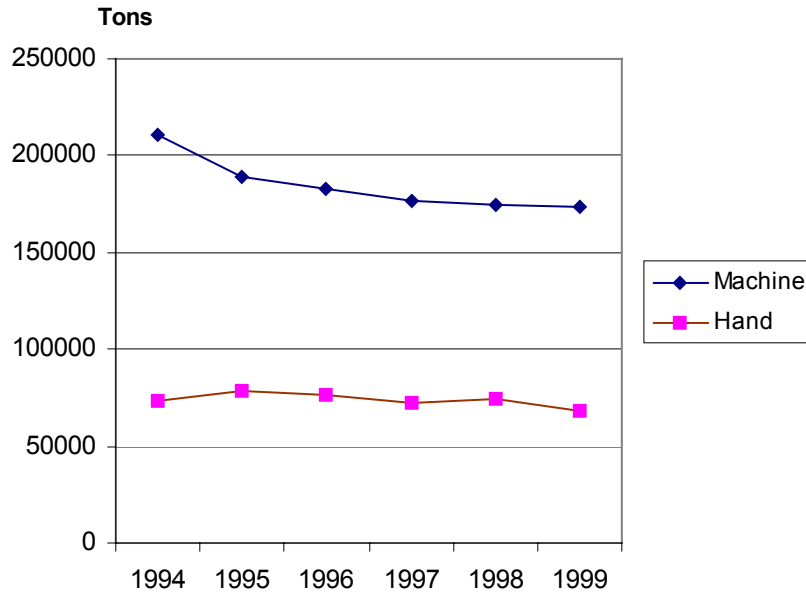


Fig 5 shows that the hand made type is declining at a lesser rate than that of the machine made type.

Traditional noodles can be consumed in the fresh form or some form of processing. The processed form is usually boiled but in the case of *ramen*, it can also be steamed or as dumplings.

Table 1 shows the composition between fresh and processed for the different traditional noodles.

**Table 1.**

**JAPAN - Noodle form: fresh and processed**

Noodle form	Percent	
	Fresh	Processed
Udon	85	15
Ramen	51	49
Soba	37	63

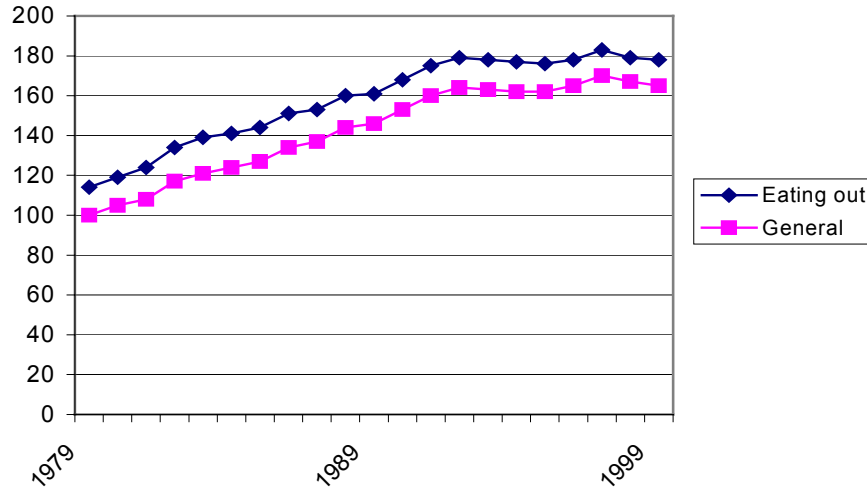
**Demand – Japan - Eating in and Eating out**

Japanese appear to be consuming more of their noodles as meals away-from-home rather than at home. In turn this is part of a general trend of eating away from home.

Fig. 6 shows the growth in expenditure of the broad category “eating out”.

Fig. 6

JAPAN. Eating out: 1979 - 1999



The impact of the Japan's boom economics during the 1980s is clearly seen as is the flattening out of growth rates during Japan's prolonged recession that began at the end of the 1980s.

Fig. 7 shows the same pattern of boom and then static to even negative growth is seen in expenditure patterns for eating out of the following four types of meals:

- Japanese noodles
- Chinese noodles
- *Sushi*
- Western meals

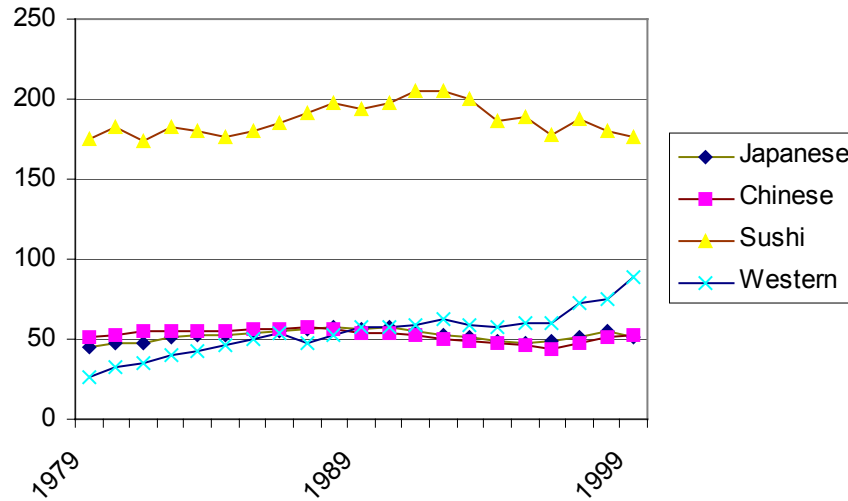
The Japanese words of the English translation "Japanese noodle" refer specifically to *soba* and *udon*.

*Sushi* has lost ground and "western meals" have increased. Although the figure does not show it well, "Japanese noodles" have gained in expenditure whereas Chinese noodles have barely maintained their level.



Fig. 7

**JAPAN. Meals eaten away from home;  
1979 - 1999**



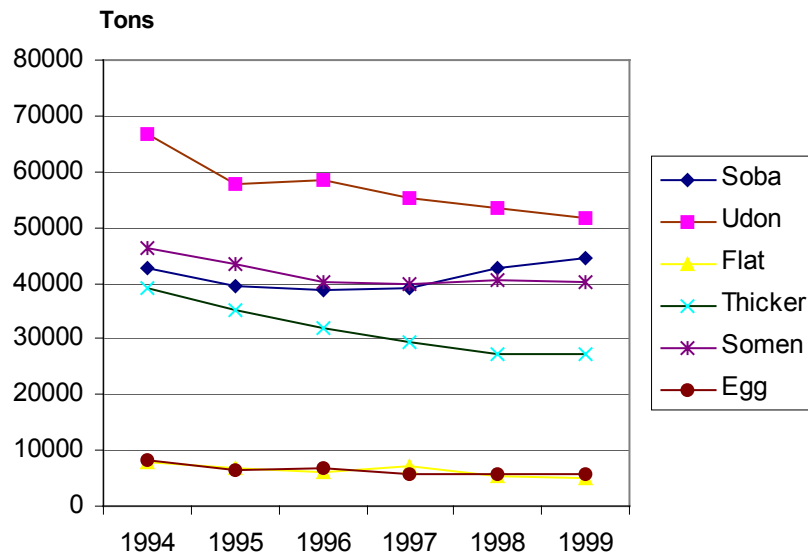
Data are available that delineates traditional noodles in terms of shape and form, viz:

- Udon
- Hitamen (flat noodle)
- Hotomonon (thick noodle)
- Thicker than somen
- Somen – angle hair
- Thin noodle
- Soba
- Chinese noodle –egg yellow

Soba's share of machine made noodle market has increased, see Fig.8.

Fig. 8

**JAPAN - Noodles. Market share of traditional noodles**



In one of the peculiarities of Japanese statistics, the associations that published the data from which Figs. #4, #5, and #8 were developed do not include the data for hand made *soba* noodles:

<b>Machine made</b>	<b>Hand made</b>
<i>Udon</i>	<i>Udon</i>
Flat noodle	--
Thicker than <i>somen</i>	Thicker than <i>somen</i>
<i>Somen</i>	<i>Somen</i>
<i>Soba</i> --	
Chinese egg noodle	--

**Demand – Japan - Soba**

*Soba* is an integral part of Japan. It is cuisine as well as culture. Three quick examples are given.

- **Toshikoshi Soba** “crossing into the new year” is a probably the most well-known traditional use of *soba*. Here, *soba* fulfils two symbolic actions. The first is that the length of the noodle represents good luck and good fortune in the new year with the longer the noodle’s length the longer the good fortune will last. Second, *soba* because it such a simple dish represents the wish to live a simple life. Ideally, *toshikoshi-soba* is eaten while the temple bells toll 108 times , this number being the Buddhist’s belief in the number of human sufferings caused by men’s earthly desires.
- **Eleven Eleven.** The date of 11 November can be written 11.11 or 11/11. This is being adopted as The Day of the Noodle as the strokes look like noodles.

- **Wonko.** At a more regional level is *wonko* in the northern prefecture of Iwate. The term itself is derived from the English “one cup”. A diner sits at a table with a bowl containing only a mouthful of *soba* noodles. This is gulped down. At once the lady standing behind the diner throws another mouthful into the bowl for gulping down. This goes on repeatedly and rapidly with the object of seeing how many bowls can be downed. Anything over 50 is an achievement and the diner is presented with a small gift<sup>5</sup>.

Regionalism is an important aspect of food culture in Japan. Prefectures are keen to promote the food of their region. This makes good economic sense with the appeal to regional loyalties offering a marketing edge in the crowded metropolises of Tokyo - Yokohama, and Osaka – Kobe. *Soba* is heavily promoted in its producing prefectures.

Part of *soba*'s strength is its appeal across the entire socio-economic strata.

At the low end of the market, *soba* is served in ultra-fast outlets. Consumers do not even sit to consume. Instead they stand at benches, curtained off from watchers by a *noren* or doorway curtain that extends to about half way down the door frame.

At the other end, *soba* is consumed in *sabi* establishments. *Sabi* is that most quintessential Japanese character, best described as “elegant simplicity”. After all, it takes a great deal of money and effort to successfully achieve the *sabi* look. High end restaurants have the suffix – *an* on their names. The word *an* means hermitage and reflects *soba*'s origins in Buddhist and Zen temples.

*Sabi* serve *te-uchi* or hand made *soba*. These tend to be a little lumpy and more uneven compared with machine made noodles. Aficionados state that these properties actually enhance its appeal.

In the middle is the *soba-ya*. This is a medium priced, sit-down shops that sell handmade noodles *te-uchi*. Even so, *soba ya* are characteristically simple both inside and out. *Soba-ya* are *shinise* or family concerns. This means that they are quite old, many dating back to the Edo period of the Seventeenth to Nineteenth Century. *Soba-ya* sell *sake* or rice wine making them more than just a place to throw down a quick bowl of *soba*.

The two fundamental food items in a *soba ya* are the *soba* itself and the broth *soba tsuyu*. Whilst these are the two ingredients, their taste differ virtually between every *soba ya*.

Not all of these stores are picked up in the official statistics. What data that is available points very favourably to the position of *soba* (and *udon* as the data does not separate the two). *Soba* shops are the second fewest in numbers of the seven shop types categorised by the Distribution Economics Institution of Japan<sup>6</sup>. However, their sales per shop are the third highest, Table 2. Similarly, they are second smallest in terms of numbers of the family restaurant subtotal but the highest earner per shop.

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<sup>5</sup> As part of his research, John Oakeshott was only able to consume 38 bowls. Nevertheless, this was considered acceptable for a foreigner and he was still given a gift.

<sup>6</sup> The following data refers to 1998 as per the Institution's *2000 Statistical Abstract*.

**Table 2**  
**Japan. Food service sector analysis by store and sales: 1998**

	Number of stores	Annual sales by Store (million yen)
<b>Fast food sector</b>		
<i>Sushi</i>	9 645	49.8
Chinese noodle	7 329	41.2
Japanese noodle	639	59.1
Curry and rice/beef bowl	1 841	91.7
Japanese style pancake	1 213	32.6
Hamburger, sandwich	5 613	108.2
Ice cream, frozen yoghurt.	785	47.0
<b>Family restaurants</b>		
Japanese-style ( <i>sushi, soba</i> )	583	146.3
Western style (steak, pizza, pasta)	4 316	143.6
Chinese style	314	71.6
Family restaurant.	1 629	114.3

The actual number of *soba* shops is vastly greater. Udesky (1995) estimated the number at 41 000, comprised of:

- 18 500 *soba* stands typical of what is found near railways stations.
- 18 500 “town shops” that serve machine-made noodles.
- 4 000 traditional shops serving hand made noodles.

For the low-end, and even *soba-ya*, *soba* shops developments in freezing technology is a major breakthrough. It is considered that frozen *soba* not retains the “bite” for which it is noted. With frozen *soba* then these shops get two-for-the-price-of-one:

- The advantage of a good even superior tasting product.
- The advantage of convenience having to deal with a frozen product.

The same advantages apply to supermarket sales and their eating-in clientele.

## **Demand - Japan – summary**

The conclusions from the above data are considered to be clear cut:

- Noodles are maintaining their position in the Japanese diet although it would be better to refer to this as the Japanese life style.
- Even though expenditure on eating out has declined, the composition of noodles in total eating out expenditure is being maintained.
- Soba is maintaining and even marginally increasing its popularity.
- More soba is eaten out than eaten in.
- The diversity of eating-out outlets serving soba is a bonus. Low end cheap and convenient soba shops will continue to grow as the Japanese life style continues its hectic pace. High-end shops in Japan, as well as elsewhere, seem impervious to economic conditions. Economic recovery will be positive impacts upon both ends and will be gratefully received by the middle type of shops.
- Growth will be in the fresh market. Developments in freezing technology will see the growth in boiled and then frozen products. This augers well for both eating in and eating out markets.

# Demand - other

Buckwheat has a surprising number of uses throughout the world. These can be viewed as traditional and newly emerging markets. The former concentrates on buckwheat as food, albeit there are other traditional uses: the latter concentrates on buckwheat as a nutraceutical.

## Demand – Other - Traditional uses

Traditional uses of buckwheat fall into human food and as a stockfeed.

### □ Demand – Other - Traditional human uses

As a human food, buckwheat is commonly used as a flour. These and other uses can be summarised as:

- Flour: bakery products such as breads, cakes, pancakes, muffins, crumpets, bagels, dumplings. When used in bread manufacturing, the preferred ratio, like that of Japan's *soba*, is around 30-40 percent buckwheat.
- Breakfast - breakfast cereals, porridge or as the Americans would have it, the dehulled seed, or groat, is milled into grits and then made into "porridge".
- Soups
- Puddings
- Poultry stuffings
- In Europe as well as the United States, *kasha* roasted groats are sold in whole and granulated forms. Both *kasha* and groats can be baked, steamed, or boiled for nutritious alternatives to potatoes and rice.
- As a meat substitute in dishes like *pilafs*.
- The Russian Army feeds buckwheat groats as part of the soldiers' rations when it is cooked with butter, tallow, or hemp-seed oil.
- For European dishes such as *polenta*, *zganec* and *varnishkes* only buckwheat flour is used.

Bearing in mind that buckwheat is extensively cultivated in the Himalayas, it is one of the food permitted to be eaten by Hindus on *bart* or fast days.

In Japan, the young leaves are eaten as a vegetable.

Beer is brewed from the grain. A company in Oregon, United States of America, exports buckwheat beer Japan.

Buckwheat produces a dark, strong-flavoured honey that is usually sold for a premium in North America. One hectare of buckwheat may produce up to 65 kg of honey per growing season.

### □ Demand – Other - New human food uses

Expanding the utilisation of buckwheat for human use evolve around its three aspects: its protein content, its being gluten free, and its amino acid composition.

## PROTEIN

With protein, buckwheat appears to be the best source of protein in the entire plant kingdom. Its nutrient values are extremely high, see Table 3 below. The human body can utilise 74 percent of the available protein in buckwheat. Although other food products are also high in available protein, many contain high levels of fat. As Table 3 shows, buckwheat is virtually fat free.

**Table 3**

**Nutrient values of selected foods  
(based on 2 ounces dry measure)**

	<b>Amaranth</b>	<b>Buckwheat</b>	<b>Quinoa</b>	<b>Spelt</b>	<b>Teff</b>	<b>Whole wheat</b>
Protein	15%	<b>15%</b>	15%	13-14%	10%	10%
Carbohydrate	35g	<b>28g</b>	35g	42g	41g	41g
Fat	3g	<b>1g</b>	3g	1.6g	1g	1g
Calories	200	<b>190</b>	200	217	200	190
Fiber	6.9%	<b>0.7%</b>	9.4%	N/a	13.5%	14%
Calcium*	10	<b>2</b>	6	**	10	2
Iron*	80	<b>15</b>	26	15	25	10
Thiamine*	**	<b>30</b>	10	25	15	20
Riboflavin*	8	<b>5</b>	10	8	4	2
Niacin*	4	<b>12.5</b>	4	25	4	10

\* Stated as percent of Recommended Daily Allowances.

\*\* Contains less than 2 percent of Recommended Daily Allowance.

**GLUTEN - FREE**

The other positive attribute of buckwheat is its alleged gluten-free property. Buckwheat is not free of gluten. Technically, all grasses, grains, and grain-like foods contain some gluten. In wheat, rye, oats and barley the gluten is free in the sense that it must be broken down to be digested. With buckwheat, the gluten is chemically bonded and thus unable to enter into any reactions in the body. Strictly speaking, buckwheat should be termed “essentially free of gluten”.

Gluten can be a problem for coeliacs, that is, those unable to digest gluten. If coeliacs continue to eat products with gluten, their intestinal walls become inflamed and erodes the intestinal villi that enables them to absorb nutrient. If consumption is continued, abdominal problems such as diarrhoea, gas, bloating, cramping and even pain can result.

The challenge for coeliacs is that pervasive presence of gluten in foods. It is known to exist in wheat, rye, oats and barley. Coeliacs have learnt to be wary of most forms of bakery products. Less well known to coeliacs is the fact that gluten is a hidden ingredient in numerous processed foods such as hot dogs, luncheon meats, soups, stews, even ice creams, as well as many so-called convenience foods.

## AMINO ACIDS

Buckwheat contains all eight essential amino acids making it a good choice for human consumption, especially where shortages of lysine and sulfur containing amino acids appear. It contains over one per cent of three amino acids: glutamic acid, arginine and aspartic acid.

**Average Amino Acid Concentrations in Buckwheat**

<b>Amino Acid</b>	<b>% in Fruit</b>	<b>% in Groat</b>	<b>% in Protein</b>
Glutamic acid	1.99	2.72	18.02
Arginine	1.47	2.01	13.27
Aspartic acid	1.20	1.64	10.86
Valine	0.85	1.17	7.71
Leucine	0.75	1.02	6.75
Lysine	0.66	0.90	5.99
Glycine	0.61	0.83	5.52
Phenylalanine	0.46	0.63	4.17
Serine	0.46	0.62	4.12
Alanine	0.45	0.61	4.03
Threonine	0.43	0.58	3.87
Proline	0.41	0.55	3.66
Isoleucine	0.39	0.53	3.48
Tyrosine	0.23	0.32	2.12
Histidine	0.23	0.32	2.11
Cystine	0.18	0.25	1.66
Methionine	0.15	0.21	1.37
Tryptophan	0.14	0.19	1.29

Combined, the three attributes of high nutrient values, essentially gluten free, and amino acid properties open up the extension of buckwheat's current usage into variations of existing known products:

- Pasta
- Puffed snacks (100 percent buckwheat flour)
- Home bread machine mixes
- Tortilla wraps
- Groats for use in energy bars for athletes.
- As a fat replacement.
- Meatless entrees.
- Dietary fiber.
- Gluten free foods.
- New forms of extruded cereal and snack products, especially those that could be targeted to special nutrition needs.
- With pasta, product containing buckwheat flour requires a shorter cooking time, thereby enhancing the efficiency of the processing plant<sup>7</sup>. This provides buckwheat with numerous potential applications in nutritious foods that could be packaged for rapid preparation.

<sup>7</sup> This may account for Italy's IBRA hosting an international meeting on buckwheat in March 2000.



- Modification of buckwheat's starches<sup>8</sup> could help to extend the shelf life of fresh pack noodles, especially soba, and be used to develop new shelf-life sensitive products.

## **Demand – Other - Traditional stockfeed uses**

Buckwheat grain is of lower quality than cereal grains when used for livestock feeds and is usually fed in combination with barley, oats or corn. Whole grain protein is approximately 11 per cent, with 2.5 per cent fat. The middlings from buckwheat “grain” are rich in protein, fat and minerals. Generally, middlings are fed only as a concentrate. The protein content of middlings is approximately 27 per cent and fat 7 per cent. The palatability of this product is poor and is not fed to swine.

Buckwheat is feed to poultry, hence one of its local English names: “Fat Hen”.

An emerging stockfeed use is as a food for game. Thus in England buckwheat is grown to supply food for pheasants. Not only is it a stockfeed, but if left standing, it acts as a shelter to the birds during the winter. A comparable wildlife use is emerging in the United States where it is used to feed deer.

## **Demand – Other - Nutraceutical**

Buckwheat has considerable potential as nutraceutical crop. Whilst definitions of “nutraceutical” abound, the common elements of a nutraceutical is any substance that is a food or part of a food that provides medical or health benefits. These typically include the prevention and treatment of disease.

According to Udesky (1992) buckwheat enjoys the following nutritional and health benefits:

- Buckwheat contains vitamins containing the flavonoid rutin. Rutin is known for its effectiveness in reducing the cholesterol count in the blood and for keeping capillaries and arteries strong and flexible. In this regard buckwheat is an effective preventative measure against high blood pressure. The effectiveness of rutin in buckwheat is strengthened with the addition of vitamin C. When harvested for rutin extraction, buckwheat is best harvested for green as the leaves contain the highest level of rutin.
- Buckwheat helps the body rid itself of unwanted cholesterol. Sterols in buckwheat prevent cholesterol from increasing in the blood serum.
- Japanese publications suggest that buckwheat helps relax the body, relieve and prevent inflammation, reduce excessive perspiration, and maintain a good functioning of the intestines.
- Buckwheat contains considerable amounts of vitamins B1 and B2. Vitamin B1 is important in rekindling energy by facilitating the working of the nerves. Vitamin B2 assists the lipids in their work. Combining these vitamins with vitamin E results in an effective precaution against hardening of the arteries (arteriosclerosis).
- Potassium, magnesium, phosphate, and iron are abundant in buckwheat flour. Buckwheat is higher in iron than cereal grains. These minerals play an essential role in the prevention of hypertension and anemia.
- Buckwheat contains choline, which facilitates the working of the liver.

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<sup>8</sup> Buckwheat flour is very high in starch. This starch has a water binding capacity of 103.7 percent, a blue value of 0.35 percent, an amylose content of 25 percent, and an initial pastin temperature of 64°C.

There are indications that buckwheat protein reduces breast cancer tumours by suppressing estradiol concentrations<sup>9</sup>.

A final area of nutraceutical potential is with Type 2 or adult diabetes.

## **Demand – Other - Summary**

Enough evidence exists that buckwheat utilisation is stuck in its traditional uses-mode and is not being used to its full potential. This new potential is based upon its health enhancing properties of high protein, virtually gluten free, and high amino acid content.

It is accepted that funding is needed to move “potential” to commercial reality. Some steps are being taken along this route eg Canada’s Agri Food Research and Development Initiative has funded arguably the world’s premier buckwheat breeding research organisation Kade Research Ltd. in Morden, Manitoba, to extract and concentrate two active ingredients from buckwheat that could be used as nutraceuticals that help delay the onset of Type 2 diabetes. Others have matched this funding but more work needs to be undertaken.

It is for the reasons of simple extension to existing products as well as potential in a totally new areas that one must be optimistic about the future demand for buckwheat.

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<sup>9</sup> J. Kayashita, I. Shimaoka, M. Nakajoh, N. Kishida and N. Kato. 1999. Consumption of a buckwheat protein extract retards 7,12- dimethylbenz(alpha)anthracene-induced mammary carcinogenesis in rats. *Bioscience Biotechnology and Biochemistry* 63:1837-1839

Female rats were examined for the effects of feeding buckwheat protein extract (BWPE) on the development of mammary tumour caused by administration of 7,12-dimethylbenz(alpha)anthracene. The percentage of rats with palpable mammary tumours and serum estradiol were lower in the BWPE-fed animals than the casein-fed ones, implying that BWPE intake retarded the mammary carcinogenesis by lowering serum estradiol.

# Supply - Japan

Japan has two sources for buckwheat:

- Domestic supplies.
- Imports

## Supply – Japan - Domestic production<sup>10</sup>

There is a degree of romantic appeal to claim that buckwheat was introduced to Japan from China by Buddhist priests, missionaries and returning pilgrims in the Ninth Century.

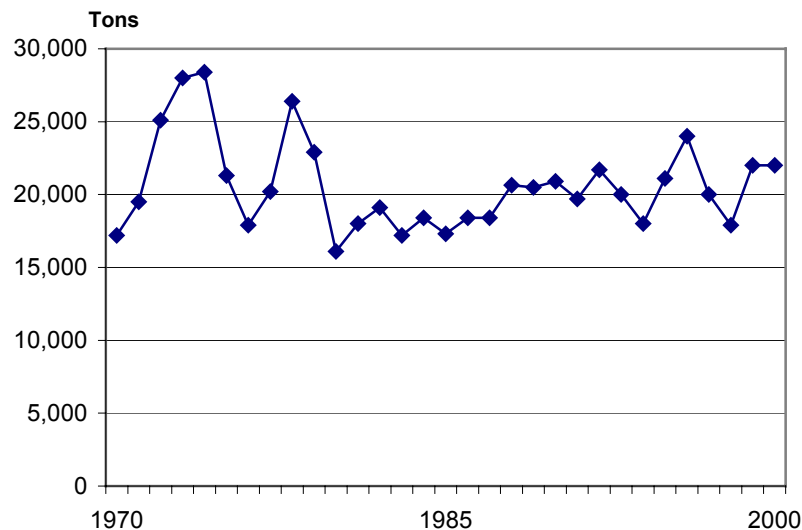
Alas, the facts show otherwise. Ujihara (1995) cites two sources to support the fact that buckwheat has been cultivated in Japan for over 2000 years. The first written reference to the word “soba” appeared in 722 A.D. when the Emperor Tenso recommended that buckwheat be planted as an emergency crop.

Ujihara (1995) estimates that the area planted to buckwheat peaked at 200 000 ha in 1800. In the mid 1950s, that is at the beginning of Japan’s economic take-off and industrialisation, plantings were estimated at around 60 000 ha.

A 30-year history of production to 2000 is shown in Fig.9.

Fig. 9

### JAPAN - Buckwheat. Production 1970 - 2000

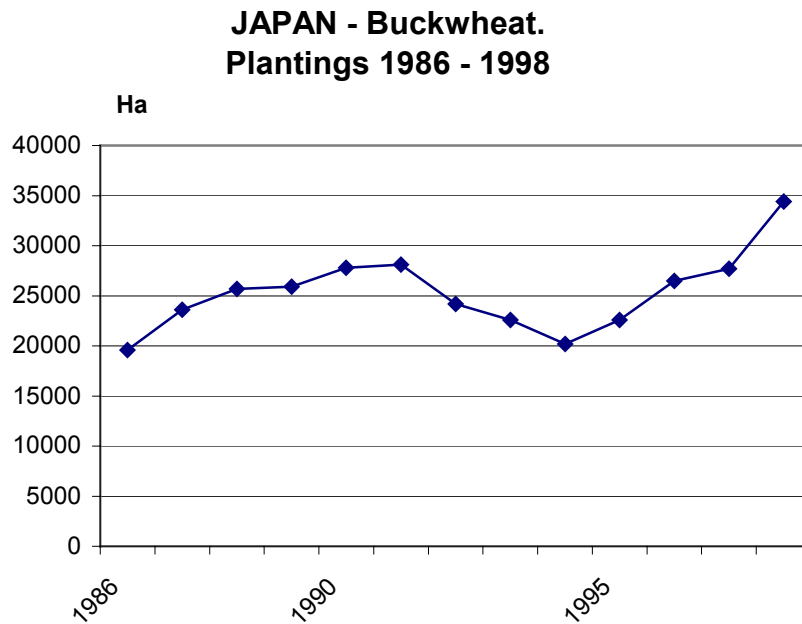


Source: FAOSTAT

Plantings appeared to have bottomed out at around 20 000 ha in the early 1990s. In 1998 34 000 ha were planted to buckwheat representing the fourth consecutive year of increases, see Fig. 10.

<sup>10</sup> This section benefited from comment and details provided by John Oakeshott of KIMJOK (Japan)

Fig.10



Source: *Statistical Yearbooks of the Ministry of Agriculture, Forestry and Fisheries*

Fig.10 shows that over the period plantings averaged around 25 000 ha per annum.

As Fig. 9 and Fig. 10 illustrate, there is a marked difference in the degree of volatility in production and plantings. Unfortunately, the *Statistical Yearbooks* make only four yield observations over the 13 year:

1989	79 kg / 10 a
1992	70 kg / 10 a
1995	93 kg / 10 a
1998	52 kg / 10 a

Nevertheless, the above observations indicate that with a high – low difference of around 80 percent, Japanese buckwheat production is as subject to variability as anywhere else in the buckwheat world. Production volatility is due to lack of resistance to natural phenomena such as typhoon, heavy rains and frost.

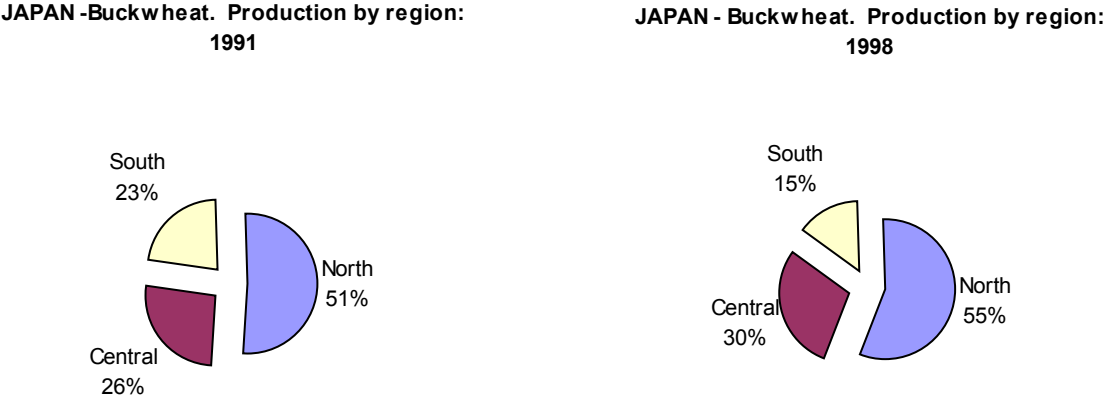
Japan has three distinct buckwheat producing regions:

- North: based on Hokkaido but with sizeable areas in Aomori, Yamagata, and Fukushima.
- Central: based on Niiagata that is a coastal plains prefecture and the highland prefecture of Nagano.
- South: based on Kagoshima on Kyushu Island and Kochi.

Hokkaido is the country's most important producing prefecture with a quarter of all plantings. In the eight years 1991 to 1998, the importance of the north has marginally increased from 51 percent to 55 percent of total production. This increase has been at the expense of the South whose share has declined from 23 percent to 15 percent, see Fig.11.

Production in Central Japan would appear to escape the worst of the problems associated with typhoons and heavy rain in the south and frosts in the north.

**Fig.11**



**Source: Statistical Yearbooks of the Ministry of Agriculture, Forestry and Fisheries**

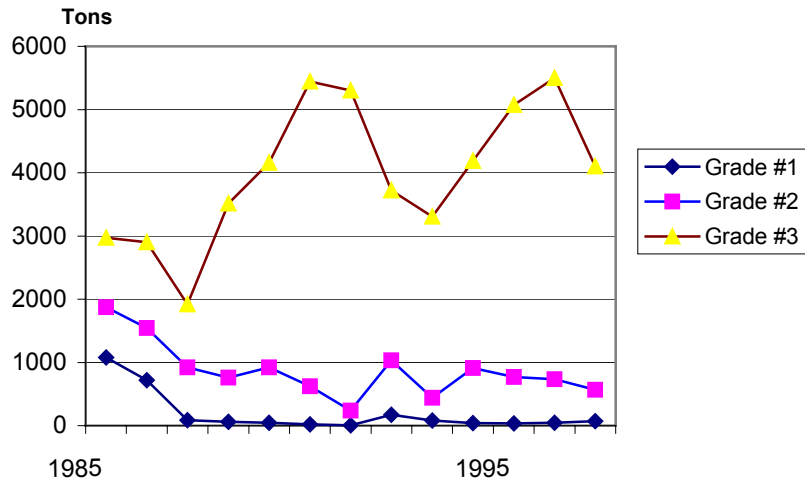
What is interesting is the volume of buckwheat produced that is eventually made available to the trade.

A spokesperson for the Japan Federation of Dry Noodle Manufacturers Association estimates that about half the volume produced actually gets to the market. A great of buckwheat is consumed on-farm or traded in a non-cash manner to those in the immediate environs of the farm.

Japan uses three grades to classify its buckwheat at the production level. Data indicate that Grade #3 is by far the overwhelmingly dominant grade, see Fig.12.

Fig. 12

**JAPAN - Buckwheat.  
Production by grades:  
1985-1997**

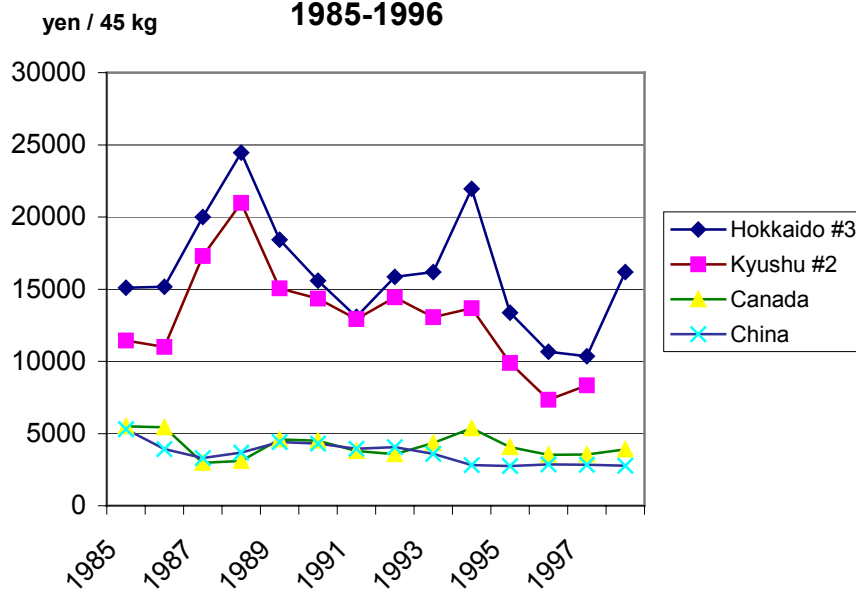


Buckwheat from Nagano is considered to be of the highest quality.

As with nearly all Japanese agricultural products, the domestic product receives a premium over the imported product. In the case of buckwheat for the period 1985-1996, this premium is well in excess of 100 percent, a figure higher than commonly experienced in most fruit and vegetables and even in most seafoods, see Fig.13.

Fig. 13

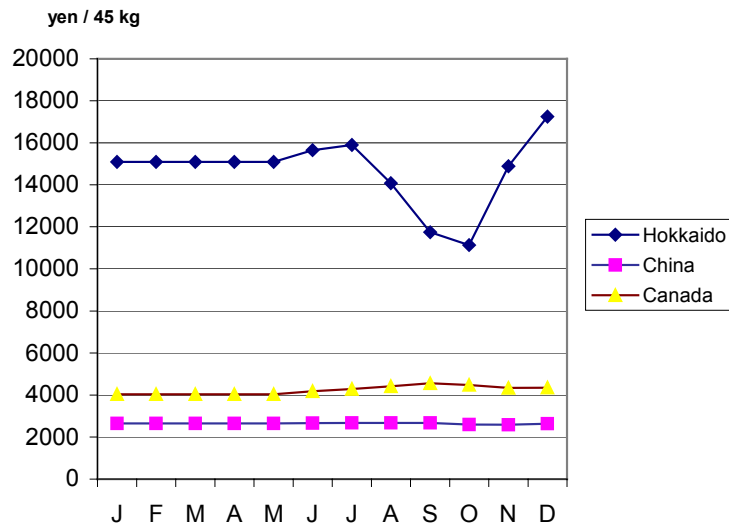
**JAPAN - Buckwheat.  
Annual domestic and imported prices:  
1985-1996**



For just 1998, the premium received for Hokkaido product was more than 300 percent, see Fig.14.

**Fig. 14**

**Japan. Buckwheat.  
Domestic and imported monthly prices:  
1998**

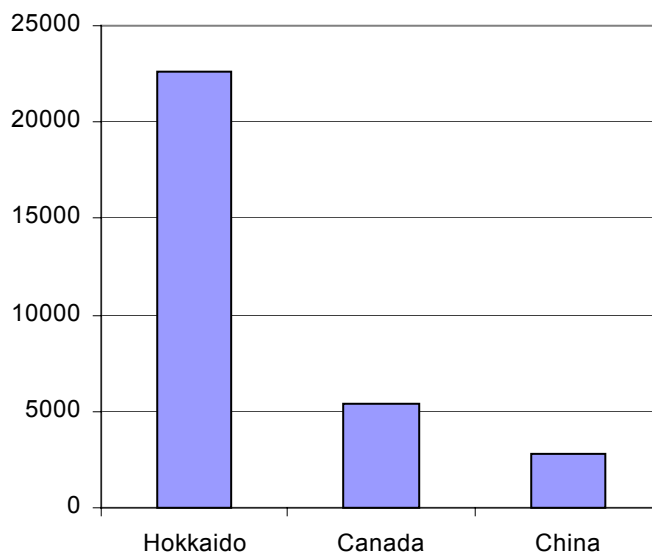


This range is a little less of that of five years earlier, see Fig. 15.

**Fig. 15**

**JAPAN - Buckwheat. Annual prices, local  
and imported product: 1994**

Yen / 45 kg



## Supply – Japan – Domestic production - Summary

The general opinion is that production will tend downwards. Most of the reasons for this are equally applicable to all aspects of agriculture in Japan, viz:

- Challenges with achieving mechanical economies of scale on farm areas that are essentially too small to achieve realistic economies of scale. The land area issue explains largely why Hokkaido is the largest buckwheat growing prefecture in the country.
- Aging farmer population means that products that lack a return commensurate with effort will decline in popularity.
- Japan's elaborate distribution system from farm gate to consumer plate means that the price of the end product starts to encroach on the price tolerance of consumers thereby encouraging those in the distribution chain to switch to cheaper alternatives such as imports.

Buckwheat production has additional downward pressures.

Japan's insistence on quality as defined by *fumi* does not encourage farmers. *Fumi* is the distinctive organoleptic characteristic that Japanese claim is unique to them, a sort of extra sensory perception. *Fumi* can best be described as "mouth feel" and exists according to Japanese buyers in nearly all food products<sup>11</sup>. Maintenance of *fumi* in buckwheat requires that it is dried naturally, specifically "standing up"<sup>12</sup>, and not by artificial means. This increases risk as it prolongs exposure to the elements. In turn, this discourages production.

The conclusion is that Japanese buckwheat production is likely to be, at best, static but more likely trending downwards.

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<sup>11</sup> The issue of *fumi* was noted by sellers in Canada and the United States, by buyers in Japan, and the president of the world's premier buckwheat breeding institute. The issue of *fumi* has also been noted by the author in regard to work undertaken over the years in product as diverse as *kabocha* pumpkin from Tonga, and uni sea urchin roe from Tasmania. No mention of *fumi* was found in *Keys to the Japanese Heart and Soul, A Cultural Dictionary of Japan, Experiencing Japanese Culture, and An English Dictionary of Japanese Culture*. A conclusion that can be reached from all of this is that *fumi* is a marketing tool. When the seller is able to satisfy all the buyers requirements in terms of the objective requirements such as variety, shape, colour, size, moisture content, even crunchiness, the buyer is able to assert power by reference back to the subjective criteria *fumi* mouth feel.

<sup>12</sup> My thanks to the Executive Director, Japan Federation of Dry Noodle Manufacturing Associations.

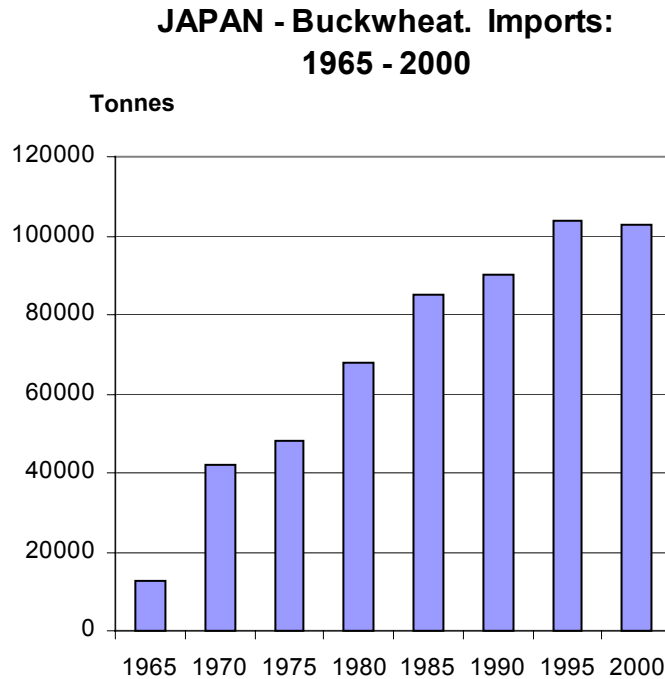


## Supply – Japan – Imports

Japan imports buckwheat to supplement its domestic supply.

Imports<sup>13</sup> really only began to be of a meaningful size in the early 1980s, see Fig.16.

Fig. 16



The surge in buckwheat imports in the 1980s parallel comparable surges across a whole range of products. This was the period of *endaka*, when the forced revaluation of the yen against the United States dollar resulted in a boom in imports. As a result, imports boomed. Buckwheat along with odd fellows such as mangoes, cherries, melons, and kiwifruit, was an *endaka*-induced product. Once the initial impact of *endaka* had passed, a number of *endaka* products resumed their pre-*endaka* pattern of slow annual increases.

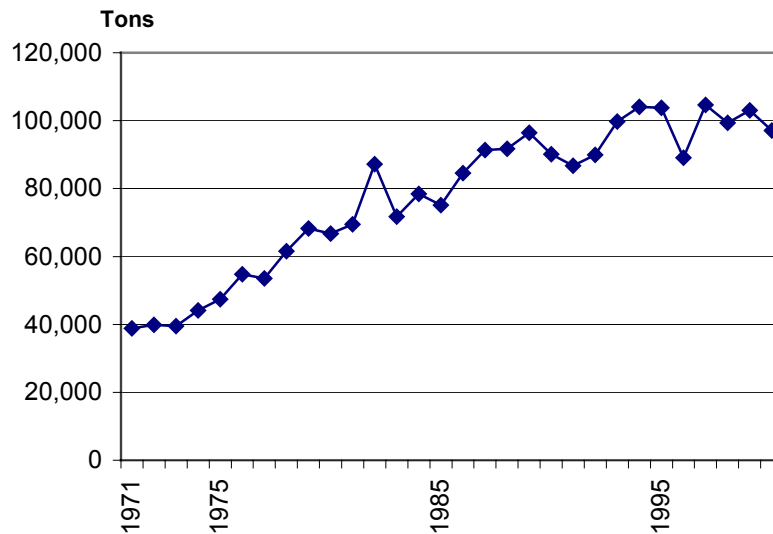
In broad terms buckwheat has followed the *endaka* trend. The slowing growth pattern of imports of the late 1980's met the Heisei recession of the early 1990s<sup>14</sup>. However it must be said that buckwheat's import growth has been at a more energetic level compared with most other *endaka* imports. Fig.17 shows that for the nearly 30 years 1971 – 2000, Japanese imports of buckwheat have continued to grow at an encouraging rate, notwithstanding the occasional dip such as occurred in 1996 when imports fell by 11 percent compared with the previous year.

<sup>13</sup> All import data is taken from the monthly publications of the Japan Tariff Association.

<sup>14</sup> No named as the recession coincided with the accession to the throne of the current Emperor that marked the beginning of the Heisei reign.

Fig. 17

**JAPAN - Buckwheat.  
Annual imports, 1971-2000**



A crude traditional relationship between the volume of imports and the price paid for those imports can be identified for the period 1900 – 2000, see Fig.18.

Fig.18

**JAPAN - Buckwheat. Annual imports, volume  
and value: 1990-2000**

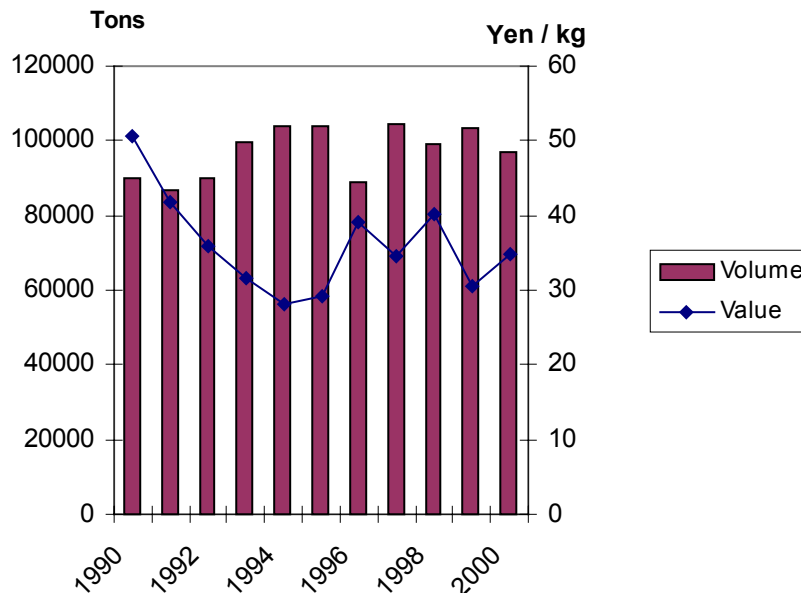


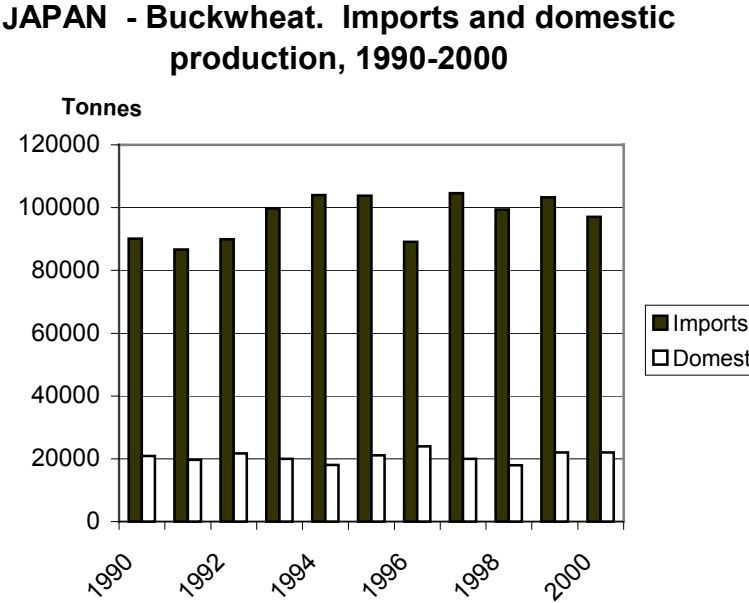
Fig. 18 shows that as the volume of imports increase the CIF price declines – see 1992-1995, 1997, and 1999 – and when import volumes decline below the previous year’s level of imports then the CIF price rises – 1996, 1998, and 2000.

It is dangerous to state that the consecutive high-low import volume and price pattern is deliberate or at least manipulative and that one can estimate future prices based on this apparent pattern. Given the role of China as the major supplier, and the patterns of production in the United States and Canada, it would be very risky for Japanese importers to adopt such a practice.

Nor can the size of domestic production be taken as a guide as to what will happen with imports. As Fig. 19 shows, whilst it is possible to establish a relationship between domestic production and imports, it is a tenuous one. To do assumes that there is a finite market in Japan for buckwheat and in this zero-sum atmosphere the size of one directly affects the size of the other. Further, the total figure varies from year to year with the degree of inter-annual variations also being variable.

In addition, the direct relationship hypothesis fails to take account of the agronomic and assumes facts behind buckwheat. That is, plantings and harvests would occur at about the same time in the traditional northern hemisphere suppliers of China, United States, and Canada. There is just not enough time for these to react to shortfalls in Japan. In addition, the challenges of storing buckwheat means that it would be difficult to bring in stored product a full season old.

Fig. 19



Despite inter-seasonal differences, there is a clear pattern of monthly import volume, see Fig.20.

Fig. 20

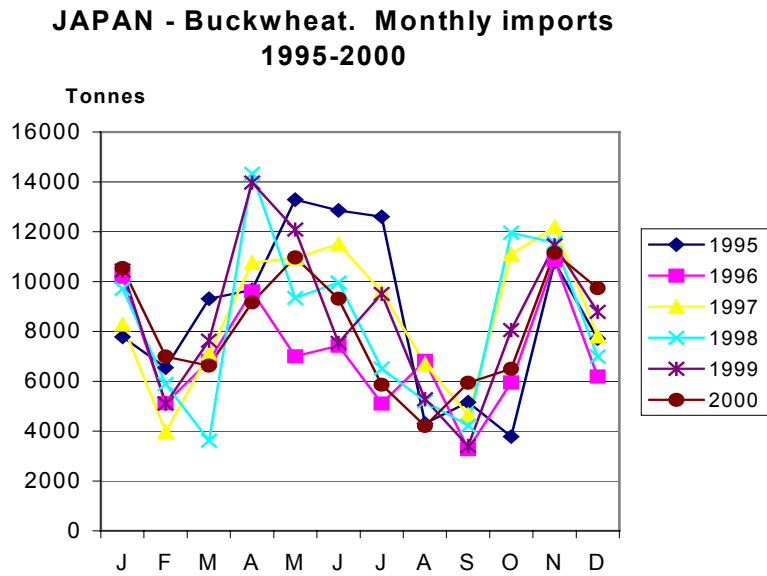
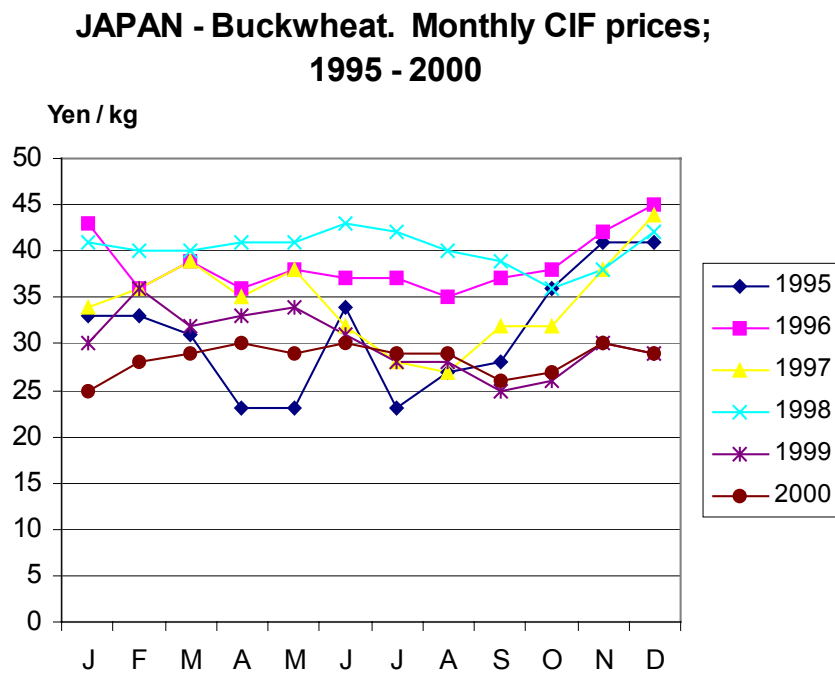


Fig.20 shows that for the six years 1995-2000 import volumes fall in January, invariably rise over the next two-three months, then slowly decline to an annual low in September before rising in October and November before sharply dropping in December. What is interesting about this clear pattern is the very tight range within which import volumes occur in November, that is, between 10 791 t and 12 191 t.

Only one such pattern occurs with CIF prices, see Fig. 21.

Fig. 21



The one observable price pattern is the rise in prices in the period September to November. However, it is stressed that this must be considered only a tenuous pattern as prices dropped in October 1998, and for both 1999 and 2000 prices have declined in December.

A number of issues arise from Fig. 20 and Fig. 21.

First, the sharp intra-seasonal patterns of imports suggest an area for counter-cyclical supply. Yet monthly imports patterns show no such degree of consistent variability. This is because counter-cyclical imports are really only beneficial to *soba-ya* restaurants and not noodle manufacturers. Thus the demand by restaurateurs off-set the lack of demand by manufacturers.

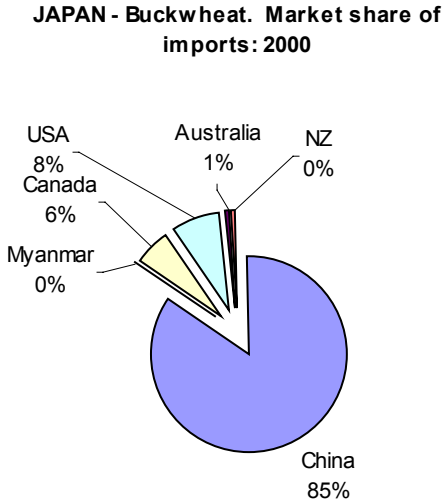
Second, October – November is the fresh new season when both volumes and value increase.

Third, the period June – August is Japan’s summer when the humidity is at its highest. High humidity is considered an enemy to good quality buckwheat.

**Origin of imports**

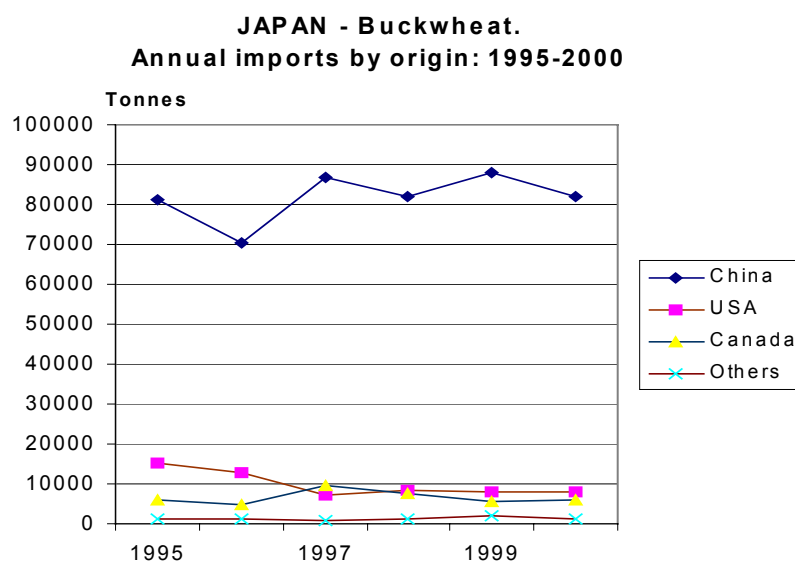
China dominates imports of buckwheat into Japan. Fig.22 shows the market share just for 2000.

**Fig. 22**



Over the six years 1995 - 2000, China has not supplied less than 80 percent. The balance is largely shared between the United States and Canada. Figure 23 shows the United States’ relative share has shrunk.

**Fig.23**



Over the years, “Others” has been an eclectic group, see Table 3.

**Table 4**  
**JAPAN – Buckwheat. “Other” imports, 1995-2000**  
(tonnes)

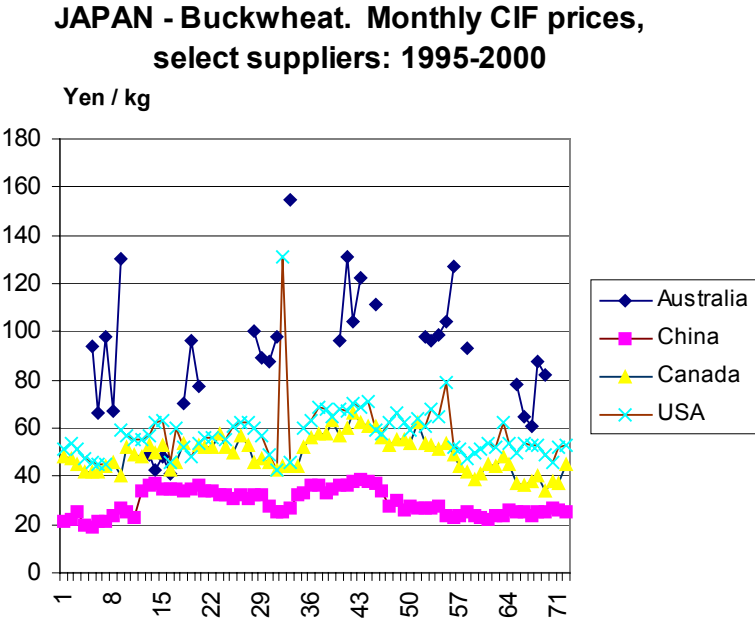
	1995	1996	1997	1998	1999	2000
Australia	573	919	908	985	1561	834
Indonesia	34	-	-	-	-	-
Switzerland	355	-	-	-	-	-
New Zealand	436	116	-	-	272	459
Russia	-	15	-	-	-	-
Argentina	-	38	-	-	-	-
Nepal	-	-	1	1	-	-
Mongolia	-	-	-	76	60	-
Myanmar	-	-	-	19	-	18

As can be seen from Table 3, Australia has always been a supplier. Whilst it could be argued that it is an inconsistent supplier, on a percentage basis its degree of variation is comparable with the other major suppliers.

A comment is needed about Myanmar. The notion to produce buckwheat started in 1992 as an activity between Myanmar and Japan to substitute opium poppy with buckwheat in the Northern Shan State. Since 1997 Japan has provided buckwheat seed and equipment, and has assisted NGO facilities in providing water supply facility, a warehouse, schools, and medical equipment. There has been exchange of personnel with the dispatch of four JICA long term experts to Myanmar and personnel from Myanmar being trained in Japan. Advice has been provided by Japanese academics and the “Japan Noodle Organisation”. For the 1999-2000 season, around 1000 ha had been planted from nearly 20 t of *Kitawase* seed provided by the Japanese Government. A price of US\$300 FOB Yangon was offered by the Japan Noodle Organisation.

Just as there is a three-tiered volume market, there is a three-tiered CIF price market, see Fig. 24.

Fig. 24



The above figure is expressed below in terms of high, low, and average prices over the six years.

	Six-Year Low (yen / kg)	Six-Year High (yen / kg)	Six-Year Average (yen / kg)
<b>Low price supplier</b>			
▪ China	19	39	29
<b>Middle priced supplier</b>			
▪ Canada	34	66	48
▪ United States	45	79 <sup>15</sup>	54
<b>High priced supplier</b>			
▪ Australia	41	155	89

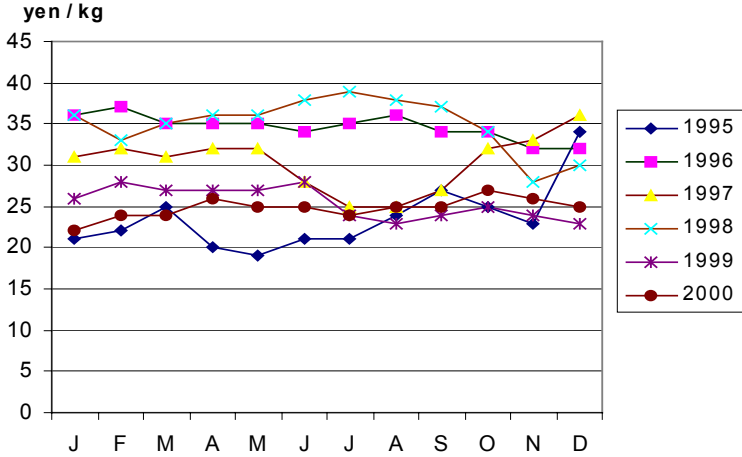
The monthly CIF figures for China are interesting for two reasons.

<sup>15</sup> This ignores the 131 yen /kg recorded in the data for September 1997

First of all there is no discernible monthly pattern, except that prices generally rise in December in that for three years it rises, for two it falls and for the sixth year it is flat, see Fig.25.

Fig. 25

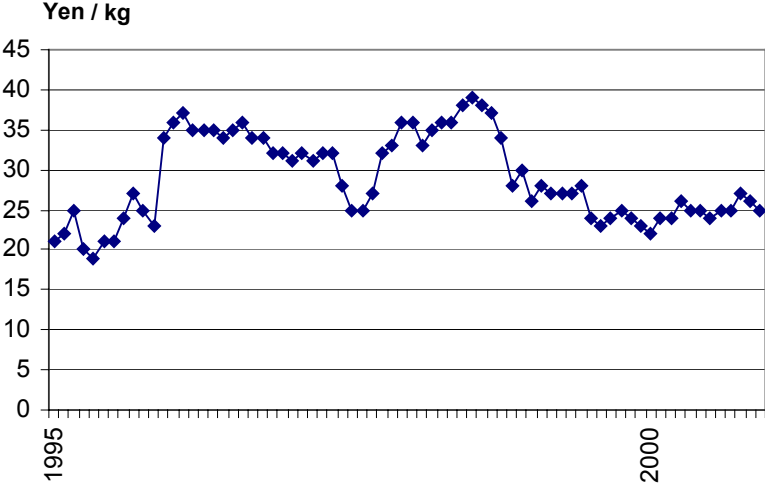
**JAPAN - Buckwheat.  
Chinese monthly CIF prices:  
1995-2000**



Second, those interviewed in Japan state that China has, and is continuing to, increased its quality markedly. If this is the case, it is not shown through the CIF monthly data. Fig. 26 shows that over the six year period, the monthly CIF price in 2000 is close to what it was in 1995. More-over there has been a distinct downward price trend since mid-1998. It would have been expected that higher quality would be demonstrated through higher prices.

Fig. 26

**JAPAN - Buckwheat.  
Monthly Chinese CIF prices:  
1995 - 2000.**





## Supply – Japan - Imports - Comment

Five comments are made regarding imports.

- **Geographic location.** It is difficult to assess the impact of the actual geographic location of the supplier. Southern Hemisphere suppliers have to cross the Equator. As many Japanese thought this was a handicap as there those who stated it did not matter. For those who were concerned about southern hemisphere suppliers, the fear was that in crossing the Equator the product would gain an unacceptable level of moisture that would damage quality. This concern was raised in the context of Australian supplies. It was considered that Australian buckwheat suppliers did not pay enough attention to the whole-chain concept and thus steps along the export path such as storage, transportation to port, port storage and container quality on the ship were inadequate.

Yet there were other importers and users who considered that the key issue was temperature, not humidity. One importer who was strong on the importance of temperature was unable to specify his required shipping temperature.

In addition, it is noted that New Zealand has supplied Japan with buckwheat for four of the six years since 1995. New Zealand buckwheat must cross the Equator but no reference to this concern and New Zealand origin product was made.

- **China.** Trade between China and Japan is not so much as country – to – country trade but rather company – to – company. The major buyers in Japan have either direct subsidiaries in China or at least affiliated companies. As such they are to manipulate their earnings and thus their tax bills by not exercising arms' length pricing policies between the two businesses. This suggests that Chinese CIF prices will continue to stay lower than what they might be. In turn this will put pressure on the other prices to stay low.
- **Origin.** Japan depends overwhelmingly on China as a supplier, that is over 80 percent. It is not good business to be so reliant. As a group, the Japanese soba manufacturers must be keen to promote production in other parts of the world. Southern hemisphere production is a viable option with the counter-cyclical notion of suppling the restaurant sector being matched by the challenges of crossing the Equator. However, it is considered that this issue is sufficiently unclear as to see a continuation in the Southern Hemisphere experiment.
- **Fumi.** If Japanese buckwheat is valued for its *fumi* and thus entitled to its premium, then it must be powerful *fumi*. After all, the volume of Japanese produced buckwheat actually entering the trade is less than 10 percent of the total buckwheat used, that is, 10 000 t out of a total of 115 000 t.
- **Use.** It is possible that the domestic product goes solely to the high-end soba restaurants where gristing and noodle making all occur in the one place. However if that is the case, then as the demand for frozen fresh boiled noodles and noodles for the cheap-end shop shops expand, the expansion will come solely from imports.

## **Supply – Japan – Imports – Summary**

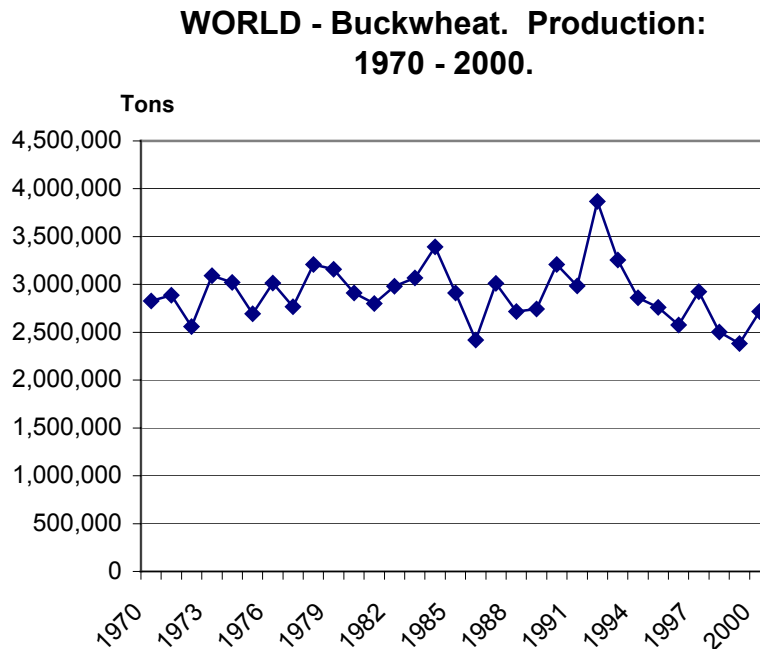
Four relevant conclusions are drawn from the preceding:

- Japanese imports of buckwheat will flatten out but there will be still be growth.
- Chinese imports will be important as they place downward pressure on high priced suppliers.
- It is difficult to equate price with supply with imports.
- The best time to export to Japan in the period from October to December.

# Supply - World

World buckwheat production for the period 1970 – 2000 is shown in Fig. 27.

Fig. 27



Source: FAOSTAT

This data is drawn from the FAOSTAT homepage of the FAO. Input for this depends upon data supplied by member countries. The data encompasses different measuring standards and different reporting periods. There is no independent cross-checking of the accuracy of the data. Traditionally, FAO data is subjected to significant revisions between publishing dates as member countries revise their previous estimates. For this reason there is a general reluctance to use FAO data. The approach taken in this paper is that FAO data represents a broad indication of the direction of the industry in those countries. All data in this section comes from FAOSTAT, unless otherwise stated.

The 2.7 million tonnes estimated to be produced world wide in 2000 is the highest level in three years.

World production is dominated by China and the Russian Federation. Combined they produce over 80 percent of the world's crop. Other producers of note are the Ukraine, Poland, the United States, Canada, Japan, and some parts of Europe.

In terms of this paper, the countries of interest are the major exporters of China, Canada and the United States.

## Supply - China

Buckwheat is a long established crop in China. There is evidence that buckwheat has been cultivated for over 2000 years.

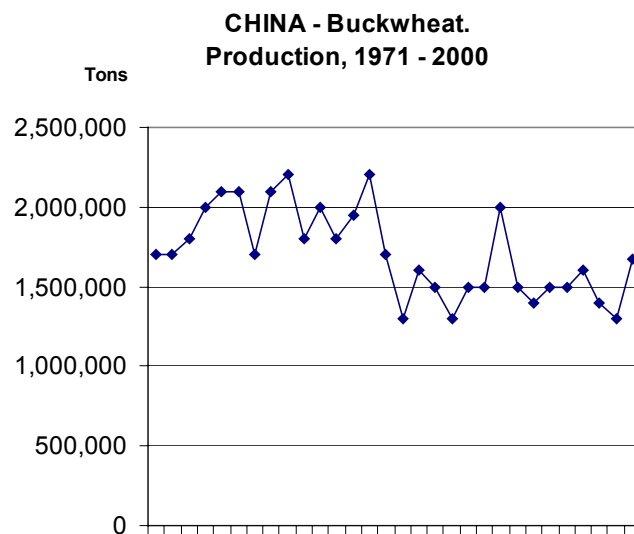
China has basically 10 species of the genus *Fagopyrum* and four wild species. Three species are important – *F.esculentum*, *F.tataricum*, and *F.cymosum*. The former is known as common or sweet buckwheat and *F.tataricum* as tatary or bitter buckwheat.

Production is widespread and in 2000 was estimated to be 1.6 m t. Whilst this is nearly three times greater than that of the next biggest buckwheat producer in the scheme of things in China it is not a big crop nor could it be considered a staple food. In the main growing area of buckwheat and the minority living area, buckwheat is the main food.

About 60 percent of production is used as food, 20 percent as animal feed, 10 percent for foreign trade, and the balance for seeds. It would appear that buckwheat is well known throughout the country and not just in the producing areas.

Production is trending downwards, see Fig. 28.

Fig. 28



It is noted that the above figures are at odds with Wei (1995) who stated that production in 1986 was 510 000 t. In contrast, the FAOSTAT level was 1.4 m t. Wei is sufficiently detailed as to state that the production came from 723 000 ha and comprised 290 000 t of *F.esculentum* and 220 000 t of *F.tataricum*.

Some Japanese importers stated that they preferred the buckwheat from the drier areas of China close to Mongolia. Reference was made to the fact that this product is able to be shipped at the preferred moisture content of 15-16 percent rather than lower levels.

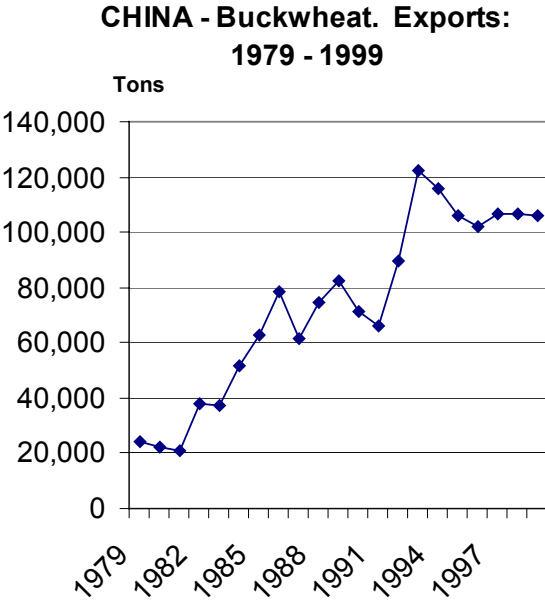
Comment was received that part of the reason for the decline in production was that the government was actively encouraging producers on the poorer soils to switch to forage crops. It would appear that there are two imperatives behind this.

First, farming was causing environmental problems in the hilled areas. Second, a great deal of the production occurred with ethnic minority groups in sensitive border areas. Thus the move towards forage pastures is seen as part of a move to augment the income of these people.

It is possible that the move to terminate China’s buckwheat research program in 1995 is related to the move to encourage the switch away from buckwheat.

China is the world’s largest exporter. In 2000, exports were estimated at 105 900 t. Exports increased strongly in the 1980s and 1990s but have levelled off since 1996, see Fig. 29.

Fig. 29

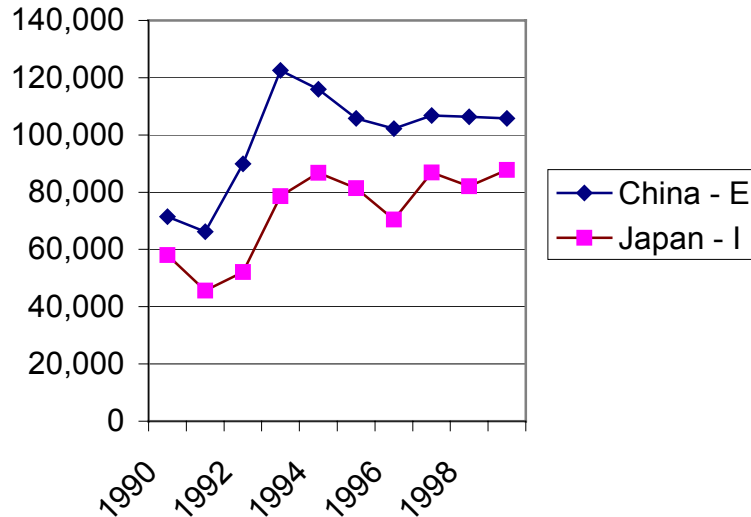


The rate of growth shown for the 1980s and early 1990s in Fig.22 is a little at odds with the trade comment that in the early days of exporting Chinese exports included *F.tataricum*. This resulted in importer dissatisfaction. It is understood that this situation has since been rectified with exports now comprising only *F.esculentum*.

Japan dominates as a destination for Chinese exports, see Fig.30.

Fig. 30

**BUCKWHEAT. Chinese exports - Japanese imports: 1990 - 1999**



The data show that China has few other export origins apart from Japan.

The result is situation of mutual interdependence: Japan needs China as a supplier and China needs Japan as a market. As such it may support the Japanese claim that China's quality has improved in recent years. This claim is questioned later on in this report in another context but if the research program has been terminated it means that Chinese quality has increased because of the input from Japanese experts. This expertise is likely to be based on a company basis, that is, experts from Japan linked to Japanese importers or processors working with select Chinese producers/organisations rather than as broad country – to – country assistance. This may explain why in the face of alleged increases in quality the Japanese have not responded in the usual form by increasing the price they pay. This is because, essentially, the rewards are going to their own company.

It has been suggested that Chinese exports have peaked and that further growth in the rate of expansion will be slow. The main reasons given for this is very much internal to China. First, as the country continues to grow economically, the demand for noodles will grow, paralleling the Japanese demand for a quick, convenient, and nutritious meal. Second, as the country's infrastructure improves there will be a change from an east-west orientation that favours exporting to a north-south orientation that favours domestic trade. Bearing in mind the recent history of China's development, this paper supports the above hypothesis.

Combined, the indications are that Chinese exports could start to slow down and that Japan may have to start looking elsewhere for suppliers.

# Supply - Canada

## Supply - Canada – Production

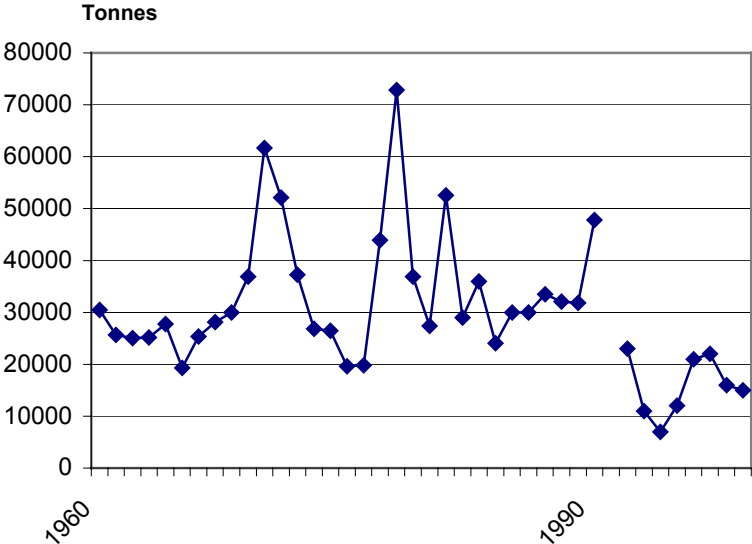
Buckwheat has had a mercurial presence in Canada.

There is little doubt that it has a long presence. Buckwheat pancakes were a staple of the early Prairie white pioneers. In turn this can be attributed to the presence on the Prairies of the emigres from the Ukraine and Eastern Europe where buckwheat was common.

A thirty year history shows that buckwheat’s presence has been far from consistent. Figure 31 shows that over the period, production has gone from a low of 7 000 tonnes (1994) to a high of 72 780 t (1979).

Fig. 31

**CANADA - Buckwheat.  
Production, 1969-1999**

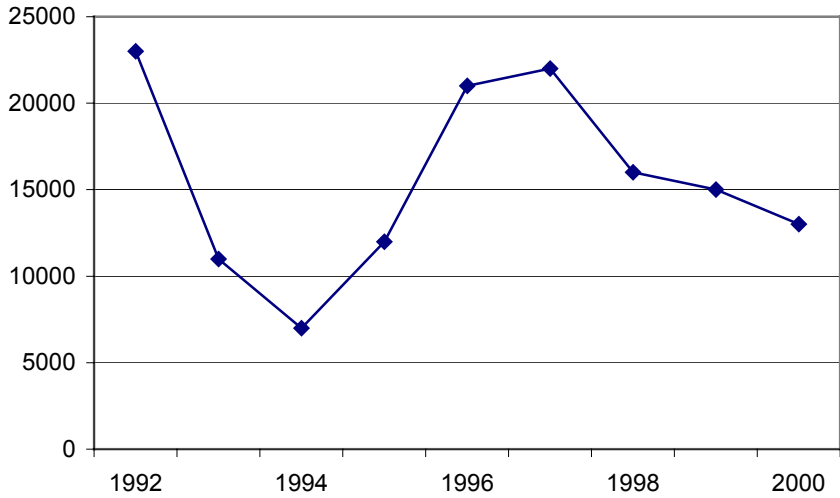


Source: Agriculture and Agri-Food Canada; Kade Research Ltd.

The data shows that the 1990s are a period of historical lows as well as significant volatility, Fig.32.

Fig. 32

**CANADA - Buckwheat. Production 1992 - 2000**

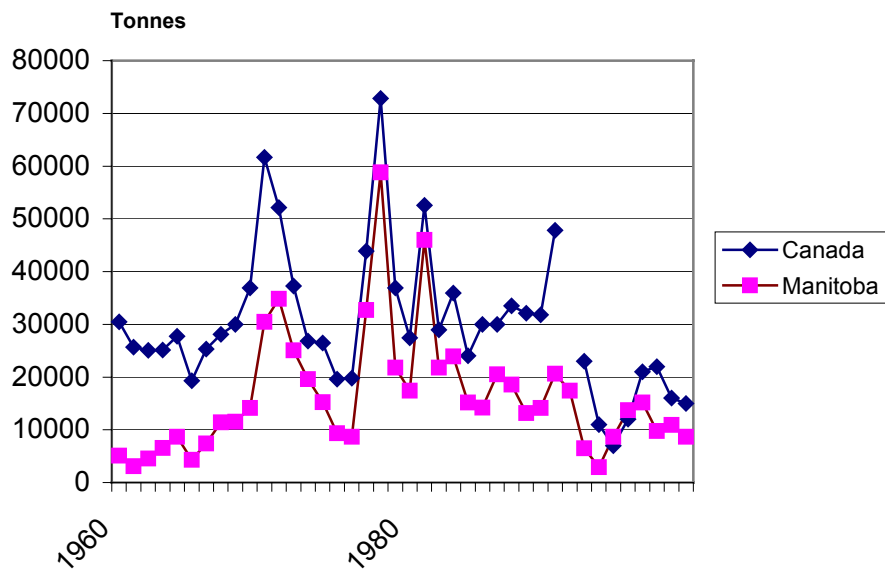


*Source:* Agriculture and Agri-Food Canada

Canadian production occurs in Manitoba, Quebec, Ontario, and Saskatchewan. In 2000, Manitoba planted 30 000 of the country's 37 000 ac. Most of the balance was shared between Quebec and Ontario, Manitoba has only recently become the major producer, see Fig. 33.

Fig. 33

**CANADA - Buckwheat.  
Production in Canada and Manitoba:  
1960 - 1999**

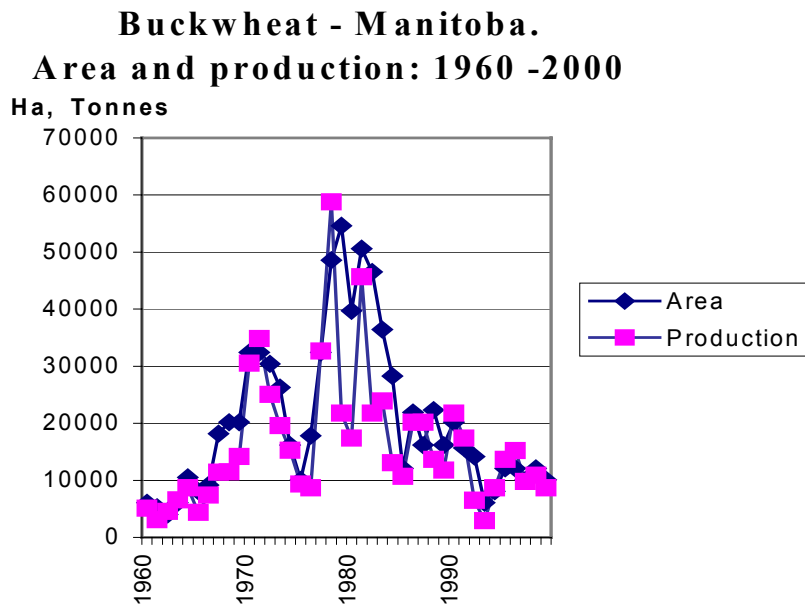


*Source:* Agriculture and Agri-Food Canada; Kade Research Ltd.: Manitoba Agriculture



Production is quite volatile due to variability in plantings and seasonal conditions, see Fig. 34.

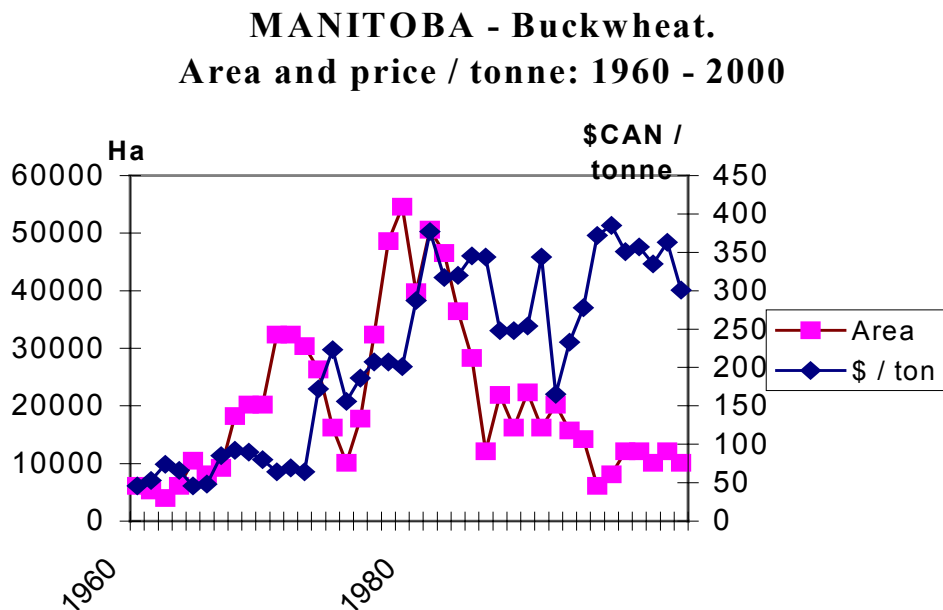
Fig. 34



Source: Manitoba Agriculture

Production in Manitoba is by a core of consistent growers supported by opportunist growers. This would suggest that prices are influential in determining at least plantings. However, as Fig.35 shows, prices in Year T need not influence prices in Year T+1.

Fig. 35

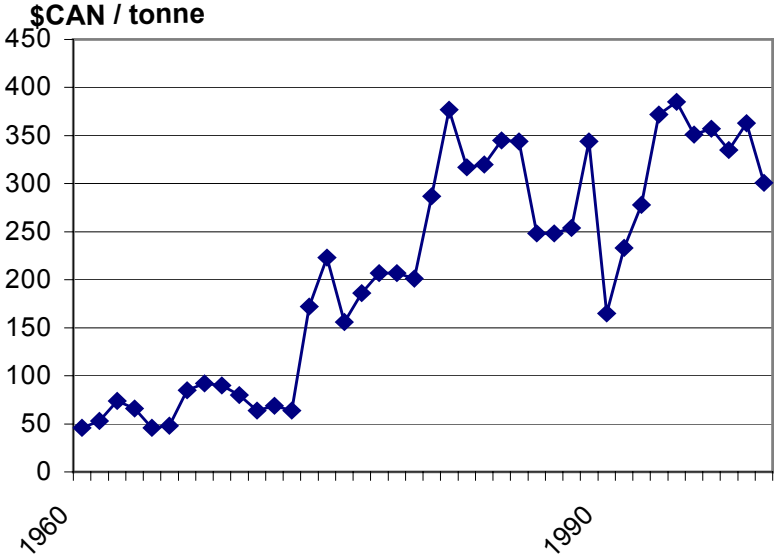


Source: Manitoba Agriculture

Unlike plantings, prices in absolute terms have shown a definite increase, see Fig.36.

Fig. 36

**MANITOBA - Buckwheat.  
Area planted and Price / tonne.**



Source: Manitoba Agriculture

It is hard to escape the conclusion that buckwheat is unlikely to rebound to its levels of a decade ago.

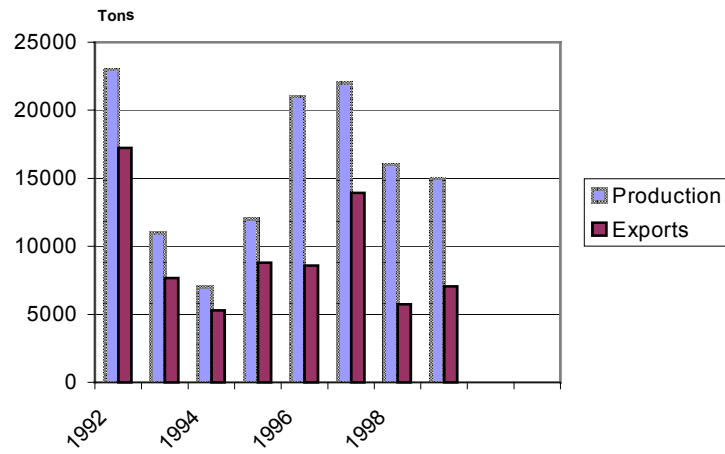
**Supply - Canada - Exports**

Key to the resurrection of the Canadian industry is exports.

For the 1990's at least, exports were critical to buckwheat's success, with more than half the crop being exported, see Fig.37.

Fig. 37

**CANADA - Buckwheat.  
Production and exports: 1992-1999**

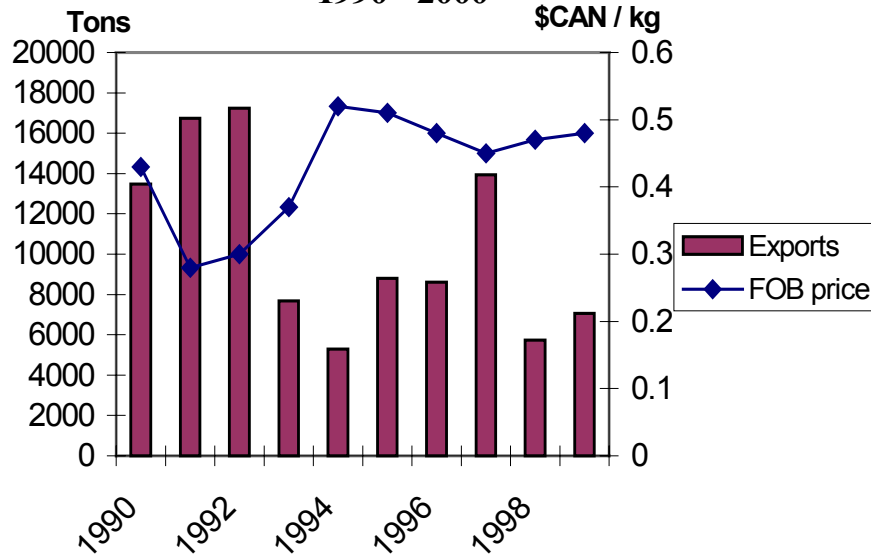


Source: Agriculture and Agri-food Canada

This means that export earnings will dictate returns to growers, see Fig.38.

Fig. 38

**CANADA - Buckwheat.  
Exports: volume and FOB prices.  
1990 - 2000**



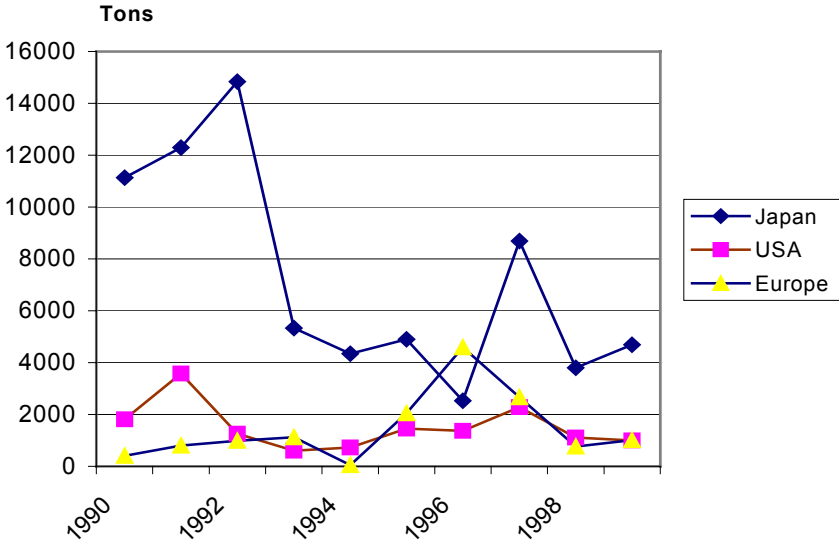
Source: Agriculture and Agri-food Canada

Again, there is no clear relationship between exports prices, and thus returns to growers, and the volume of exports. FOB prices have been around \$CAN500 /tonne for the last six years and yet the area planted has continued to decline. In addition, with FOB prices being around \$CAN500 / tonne and growers prices being around \$CAN400 /tonne, it would appear that growers are receiving a fair return without there being undue “middleman” profit.

Most of Canada’s buckwheat exports go to Japan with much smaller volumes to Europe and the United States, Fig.39.

Fig. 39

**CANADA - Buckwheat. Export destinations, 1990 - 1999**

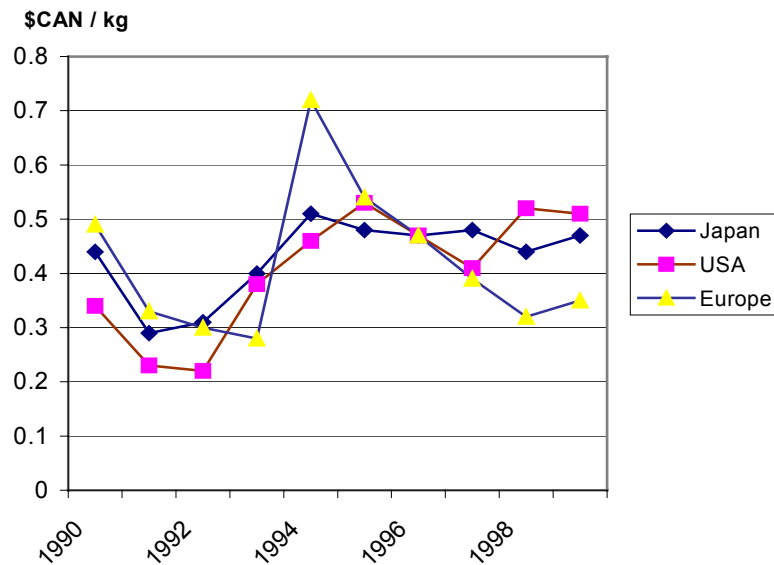


Source: Agriculture and Agri-food Canada

However, in the face of the marked decline in the Japanese market, the importance of the European and United States markets is increasing. As Fig.40 shows, the prices Canada receives from Japan are no longer well in advance of those it receives from Japan. Prices from Europe have lagged behind those of the other two.

Fig. 40

**CANADA - Buckwheat.  
FOB prices, 1990 -2000**



Source: Agriculture and Agri-food Canada

The challenge for Canada is that for product destined for Europe is the determination of exactly where is the final destination. The data states that the apparent destinations are “Netherlands” and “Belgium”. This is clearly Rotterdam and Antwerp, arguably the greatest entrepots in the world. There is the view that the product goes onto Poland, Russia, France, and “Eastern Europe”. Without the final market being clearly known, Canada is inhibited from undertaking a program of market as it has with many of its other products.

Trade with the United States is considered to be an understatement. It would appear that growers in Manitoba at least informally deliver their products into North Dakota.

### Supply - Canada - Summary

In terms of the buckwheat trade to Japan, Canada is an enigma.

Canada has lost market share to China. This is generally traced back to the actions of a Canadian who in the late 1980s took Canadian bred seed to China. On the premise that Japanese buying behaviour is based on variety and then price, Japan switched to buckwheat from China. Canada’s two disastrous crops in the early 1990s encouraged Japan to move to Chinese origin.

It is generally considered in Canada that Canadian quality is the market standard. Yet CIF data from Japan does not support this with Canada ranking a clear third behind Australia and the United States.

Yet the Japanese buckwheat industry supports Kade Research Ltd., the private buckwheat breeding centre in Manitoba. It is certainly is not the only centre in the work nor is it the biggest. Yet Japanese Buckwheat Manufacturers Association provide the centre with considerable financial support. Equally importantly, it provides Kade with precise objectives in its breeding program, eg objective taste criteria and desired physical properties in terms of colour and starch content.

Canada seeks to supply in the warmer summer months to take advantage that this is not a good time to supply buckwheat in Japan. In turn this is a function of Japan having basically poor storage. Some producers and dealers in Manitoba have invested in a doubled silo, that is one side the other with the gap between acting as an insulator. Buckwheat stored over the Canadian winter is basically frozen by the use of ambient temperature. When the temperature drops below, say  $-30^{\circ}\text{C}$ , fans are turned on that draws the cold air into the silos. Only three or four days are needed to freeze a silo. This maintains quality well into the hot summer months. Shipment in reefer containers maintains the temperature.

## Supply - United States

### Supply – United States - Production

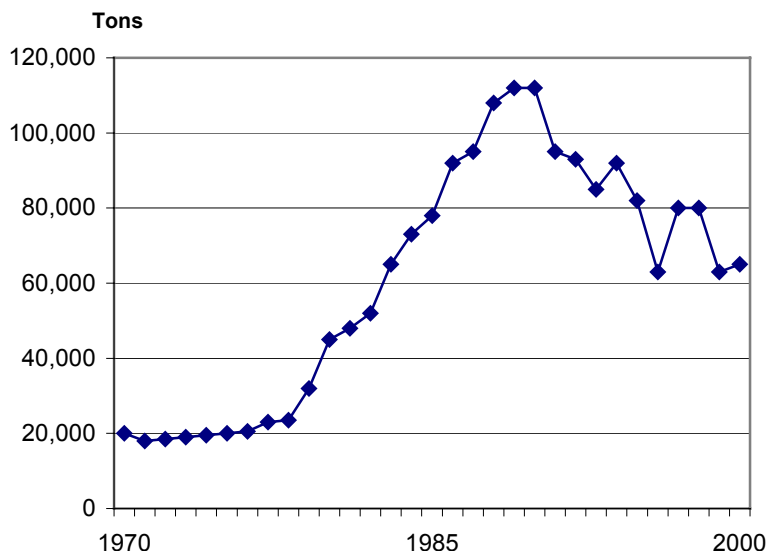
Buckwheat has been grown in America since colonial days. Production peaked in the mid-Nineteenth Century when it was a common livestock-feed and was in demand for making flour. It would appear that well over a half a million hectares were planted. Indeed, over 200 000 ha were thought to be grown in New York and Pennsylvania alone. Since then its history has been one of decline. By the mid 1960's the acreage had been reduced to about 20 000 ha.

Hindering the establishment of a detailed picture of the current United States buckwheat industry is the fact the United States Department of Agriculture stopped keeping detailed records concerning buckwheat production in 1980. Surrogate production data can usually be gleaned elsewhere. However bedevilling establishing a firm picture of the United States buckwheat industry is the fact that it the crop is one of the very few, if not the only crop, in the United States that is not a beneficiary of the plethora of government programs available to agriculture in general. Further, buckwheat is almost always grown under contract. Finally, not all local grain elevators handle buckwheat. Combined, the three factors remove the existence of capture mechanisms normally associated with establishing detail industry statistics in the United States.

One source is the FAO. According to it, buckwheat production in the United States was static around 20 000 t during the 1970s and then grew strongly through the 1980s. That data set indicate that production peaked at 112 000 t on 1990. Declines from that peak have not been as rapid. Nevertheless, it has halved to 60 000 t in 2000, see Fig.41.

Fig. 41

#### UNITED STATES. Buckwheat production: 1970 - 2000

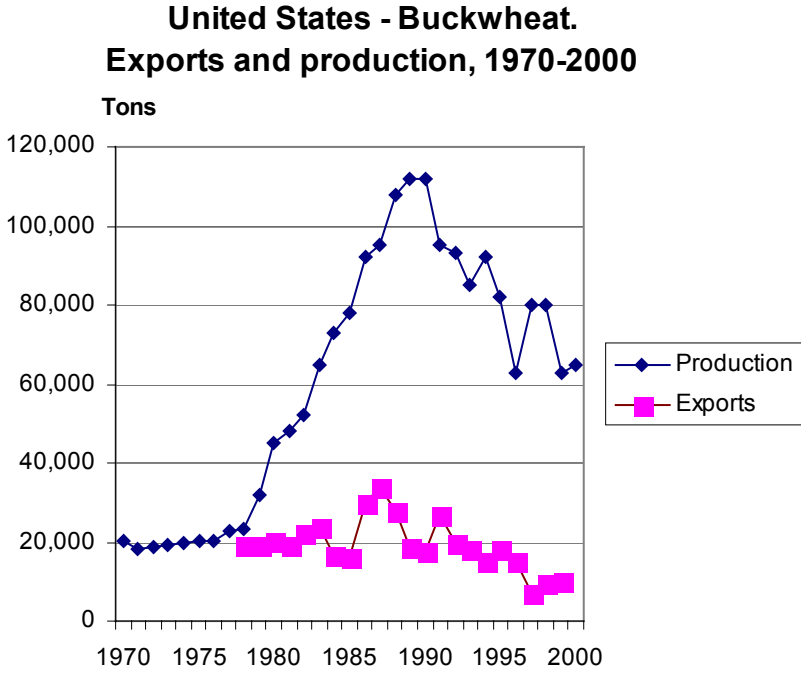


In terms of the 1970s, this data set accords with other data.

However, the suggestion that production rose to over 100 000 t is dismissed.

To begin with, discussions with industry and government officials both in the United States as well as Canada strongly suggest that production never even approximated these values. To absorb such a level of production there would need to be a considerable number of processing plants, an elaborate distribution system for domestic consumption, and significant exports. Given the peculiar shape of the buckwheat, and with the halving of the industry it would be anticipated that there would be surplus dedicated machinery now available. This doesn't seem to be the case. To ascribe the growth and then decline in production to exports is not warranted by export data, Fig.42.

Fig. 42<sup>16</sup>.



Source: FAO

In the absence of reliable government statistics, use is made of data generously supplied by Minn-Dak Growers Limited<sup>17</sup>. Based in Grand Forks North Dakota, with 300 growers under contract, Minn-Dak would be the country's largest processor and supplier of buckwheat.

Details are available for seven states, see Table 4..

<sup>16</sup> Export data not available prior to 1978.

<sup>17</sup> Special thanks to Mr Steven Edwardson, Director, Research and Development at MINN-DAK, Grand Forks, North Dakota.



**Table 4**  
**UNITED STATES. Buckwheat area.**  
**(ac)**

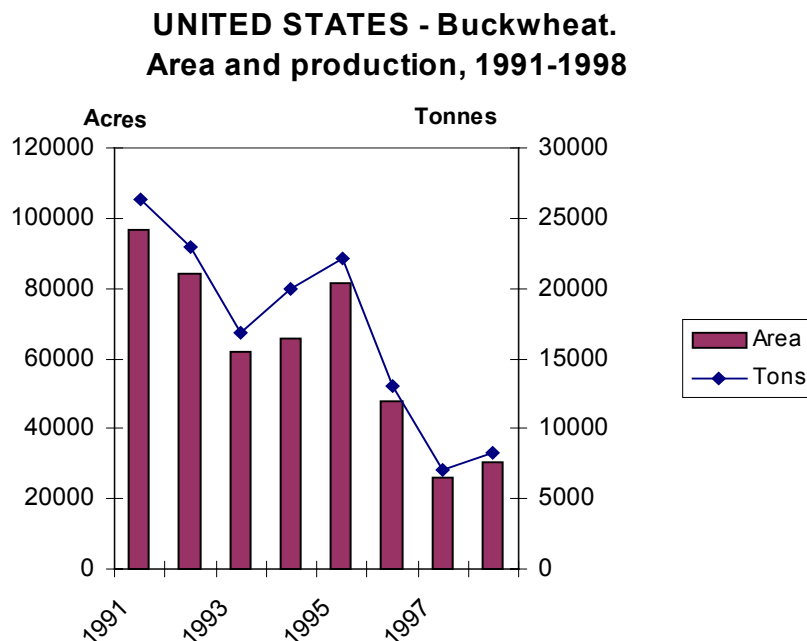
	1991	1992	1993	1994	1995	1996	1997	1998
Illinois	n.a.	2265	2097	1500	2639	n.a.	n.a.	n.a.
Minnesota	14945	9825	9534	9000	14522	7214	6715	7241
Montana	11343	3546	3118	2803	1893	1429	472	1475
North Dakota	38838	37999	27701	28081	40965	16741	9262	12949
South Dakota	27348	26643	14059	17979	18000	18652	4867	5000
Washington	1000	3000	4000	5000	3500	4000	4500	4000
Others*	3200	1143	1234	1500	n.a.	n.a.	n.a.	n.a.
<b>Total</b>	<b>96674</b>	<b>84421</b>	<b>61743</b>	<b>65863</b>	<b>81519</b>	<b>48036</b>	<b>25816</b>	<b>306650</b>

\* Includes Indiana, Oregon, and Texas

However it is known that relatively significant production also occurs in New York and Pennsylvania. Bjorkman states that this is as high as 25 000 ac but it is hard to accept that an area the same size as the combined plantings in Minnesota, and North and South Dakota could occur without there being serious recognition of this by industry and government sources in both the United States and Canada.

United States production has declined significantly in the 1990s see Fig.43.

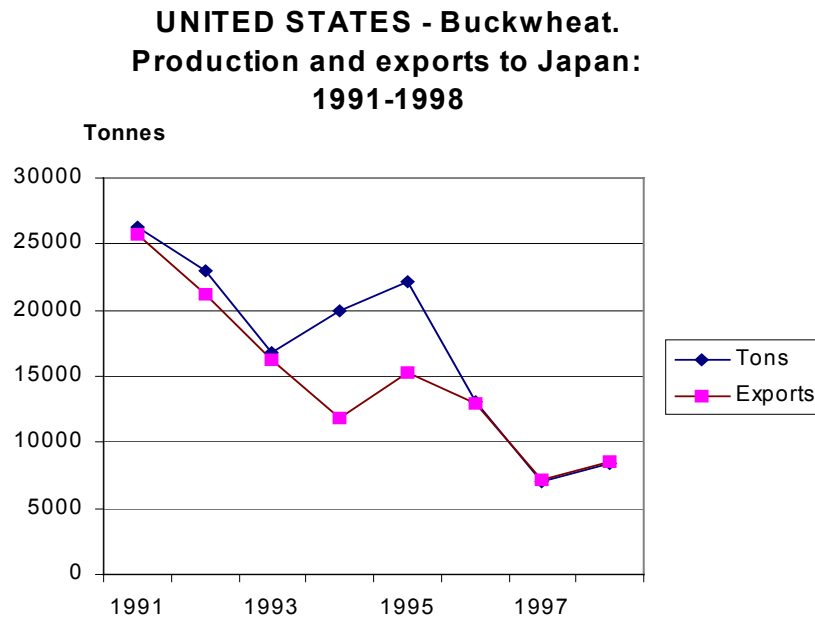
**Fig. 43**



## Supply - United States - Exports

The decline in production reflects faithfully the decline in exports to Japan, Fig.44.

Fig. 44



## Supply - United States - Comments

As with a number of foods, the United States has a wonderful ability to “import” a food, adapt it to its own tastes and then adopt as its own. Pizza is one example. From Japan, the United States has imported sushi and nori rolls, that is seafood and rice wrapped in seaweed. This was adapted to the “California roll” with no seafood: California rolls are now common fare back in Japan. The same with soba. The United States has adopted soba, to the extent that the Japanese manufacturer now has two recipes in terms of buckwheat flour and wheat flour, one for the United States and one for Japan. This is not seen as a big market.

Buckwheat suffers from a number of negative comments that is affecting its downward production trend.

- **Loan program.** Buckwheat production is handicapped by the absence of any loan program. This is the unique United States system that treats the government as a giant pawn broker. That is, a grower can grow his crop and deliver it to a silo under the loan program. Assume that the government’s declared “loan” price for a crop is US\$4.00<sup>18</sup>. The grower “lends” his crop to the government for US\$4.00 and in exchange receives a “pawn” ticket for US\$4.00. If the market price falls to, say, US\$3.50, the grower does not bother to redeem his “pawn” ticket. However, if the market price rises to US\$4.50, the grower may choose to redeem his pawn ticket/loan, take title to his crop, pay the storage charges, sell his crop at US\$4.50, repay the government its US\$4.00, and pocket the difference. By giving producers the assurance of a floor price, growers can eliminate at least their marketing risk.

<sup>18</sup> US\$4.00 per lb/bushell/ton does not matter for the sake of the illustration.

Buckwheat does not have a loan program and thus buckwheat growers do not have access to a risk reduction avenue. This tends to bias United States producers against going into buckwheat.

- **Crop insurance.** Buckwheat does not have access to a crop insurance program. These schemes tend to be private and no private insurer has seen fit to include buckwheat. Again, this is a factor militating against risk averse producers going into buckwheat production compared with industries that have a crop insurance program.

A prototype scheme has been developed but not introduced.

- **Chemicals.** Buckwheat suffers from there being no chemicals registered for use. In a climate of increasing concern about the use of chemicals this is considered a handicap as there is no means of pointing to research that proves the efficacy of the any chemicals being used.
- **Seed.** The industry has recently been able to access open-seeded varieties. Whilst these have the advantages of enabling breeders to breed in new attributes more quickly, for example frost resistance and different colours, it has been found that the use of opened-seeded varieties can result in considerable yield variations. In addition, there can be a problem with self-set seeded. There was industry comment that production in Minnesota folded because the Japanese rejected shipments because they claimed that the crop contained self-set and planted varieties.
- **Information.** There is marked dearth of up-to-date extension information. In the main, most publications are quite old, the research quite limited, and advice being only of a general nature. The call for information is two-way: extension advice is that producers have to be aware of standards but in four years at the Grand Forks County Extension office there had been no call for standards and the Fargo North Dakota headquarters of the state office of the United States Department of Agriculture there has not been a request for buckwheat standards since 1988.
- **Limited markets.** Buckwheat, at least on the northern Prairies, has limited market outlets in terms of elevators to take the crop and pay the grower. In addition, there is a limited local livestock industry that in southern and eastern states can be a useful market outlet. In the East, that is New York and Pennsylvania the majority of the crop appears to be processed into kasha for the traditional Jewish and Polish food market centred on the North-East. This cannot be considered to be a sizeable market.
- **Finance.** Production costs are usually underpinned by either a contract from a marketer /elevator or a bank. Given that buckwheat must be marketed the year it is produced, a contract is considered essential. This tends to discourages producers who do not like being tied whilst the banks have generally been reluctant to advance money for buckwheat production without some firm idea of the likely income.
- **Competition.** In the Prairies, flax is emerging as a serious competitor to buckwheat.

Buckwheat does have a number of positive attributes.

- **Last minute.** Buckwheat's short growing season does make it attractive for last minute planting decisions.

- **Whole-of-farm.** Buckwheat followed by wheat appears to enhance the wheat's yield. It does this through breaking the disease cycle common with near mono-cropping, increasing the phosphorus in the soil available to plants and smothering competing weeds thereby reducing the need for herbicides. For producers taking a whole-farm approach, this is a considerable advantage.

This explains one of the three categories into which growers can be placed within the Minnesota-Dakota region, that is, a sizeable core of full time growers, those that use buckwheat as a rotational crop, and speculative growers.

- **Costs.** Because buckwheat requires fewer sprays compared with other crops in the Minnesota-North Dakota region, production costs are lower. Fewer sprays are also an advantage in an atmosphere of low chemical use.

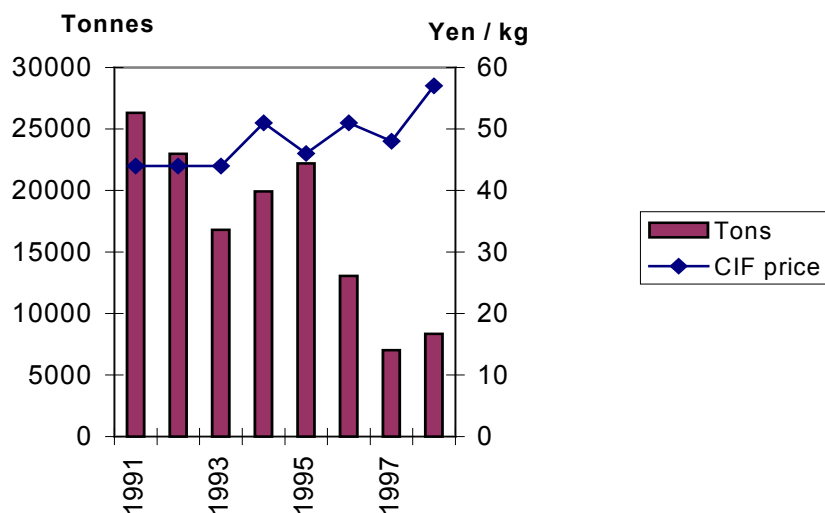
Despite the negatives, it is considered that four factors will encourage producers to reconsider their buckwheat production.

- **Japan.** As with Canada, there is evidence that as a group the Japanese buckwheat millers and importers want to have the United States as a supplier.

Figure 45 shows that despite the decline in exports to Japan, the Japanese CIF import price has actually risen over the decade. The Japanese import CIF price has to be used because data are not available for United States' export or FOB price.

Fig. 45

**UNITED STATES - Buckwheat.  
Production and CIF Prices Japan:  
1991-1998**



The figure suggests Japanese importers have sought to stimulate production in the United States by increasing the CIF price. This is not to say that Japanese importers willingly concede price increases. Nevertheless the annual CIF data from Japan does show rising prices.

- **Supply methods.** North Dakota – Minnesota, like Manitoba has arguably one of the greatest attributes in supply methods – winter. It is becoming common for insulated silos to be built. When the temperature reaches below, say -30°C, huge suction fans start up, drawing in cold air. This goes on for several days. The silo is then sealed with the product well and truly frozen. Informal tests in North Dakota indicate that the buckwheat keeps its freshness well through the baking Prairie summer. This allows them to escape the challenge of shipping in a period of high humidity and in fact to move into the favourable October onwards period.

- **Other export markets.** In 2000, MINN-DAK was able to have buckwheat placed on the PL 480 program. This is specifically for Russia. However it can be expected that the same program will be extended to over members of the former Soviet Union as well as other countries in the former Eastern Bloc where buckwheat is traditionally consumed as both a human food as well as a feedstock. It is understood that the United States will export annually 5 000 t of buckwheat flour to Russia.

At the same time it is understood that approaches have been made to have United States buckwheat made part of the World Food Program (WFP). This is a subsidiary program of the FAO. Buckwheat has the appeal of possessing a number of positive health attributes, that its pancake and noodle making attributes are compatible with a large number of cultures currently within the WFP, and being requiring a minimum of resources such as heating fuel to convert it to food. Like the PL 480 program, acceptance into the WFP means that non-market considerations become important and that the buyer tends to be the government.

- **New product development.** This issue has already been considered under **Demand – other**. It is raised here because a lot of the initiatives have come out of Minn-Dak Growers Ltd and thus the initial and prime beneficiaries are the growers in the are serviced by Minn-Dak.

## Supply - United States – Summary

It is considered that the United States will actually start to leave a gap in the market with regard to supplying Japan.

- The driving force here is the development of the PL 480-aided market. This has the significant advantage of being an easier market to supply compared with the Japanese market.
- Increasing domestic demand for non-traditional uses of buckwheat will see domestic production increasingly supplying local demand.
- The breeding of special varieties with specifically enhanced attributes will help drive the move towards a greater diversity away from traditional markets.

# Australia

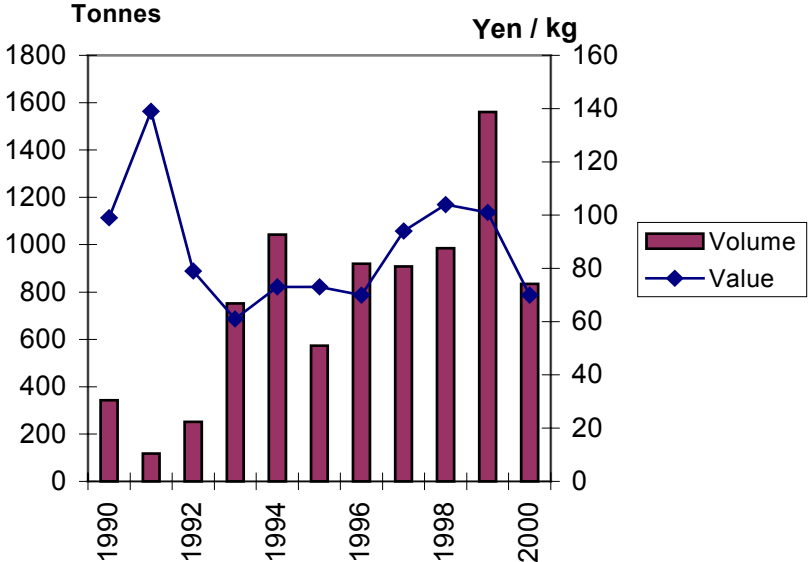
Australia is treated before the much larger producers of the Russian Federation, Ukraine, and Poland because over the past decade it has been the third tier supplier to Japan.

It is considered that Chris Bluett and Stuart Clarke from Victoria’s Natural Resources and Environment have so provided a number of papers on the Australian buckwheat industry that little new can be added by this report. Instead, this paper will concentrate on the Australian industry from the Japanese perspective.

Australia is the smallest regular supplier to the Japanese market, see Table 3, but, as shown in Fig.24, by far and away the highest price supplier. Over the 10 years to 1999, its average annual volume has been 740 t and the average annual CIF price Yen 99 /kgs, see Fig. 46.

Fig. 46

**JAPAN - Buckwheat. Annual Australian imports by volume and values: 1990 - 2000**

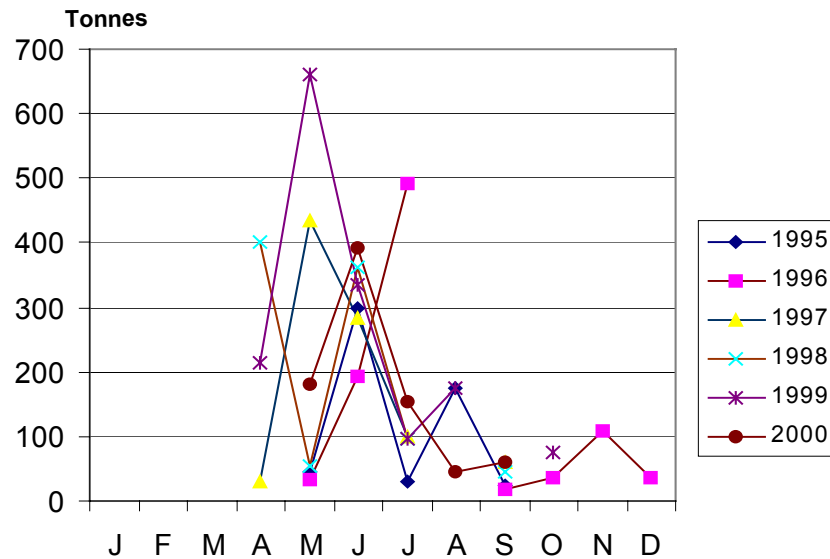


It is too early to tell if the dip in CIF prices in 1999 and 2000 are a trend.

At the same time Australia is a very erratic supplier, see Fig.47.

Fig. 48

**JAPAN - Buckwheat. Monthly imports from Australia: 1995-2000**



The erratic nature is not only expressed in terms of inter-seasonal variations but also in terms of intra-seasonal changes.

It must be pointed out that Australia's inconsistent supply pattern is not unique amongst exporters to Japan, nor is it any greater than that of Japan's own domestic production. For the five years to 2000 Australian imports can claim a higher degree of stability in its production.

What is disturbing though is the pattern of monthly supply. In the six year period to 2000 there have only been two that Australia has supplied in the same months. History suggests that all Japan can really depend upon is that Australia will supply in the three month period June – August.

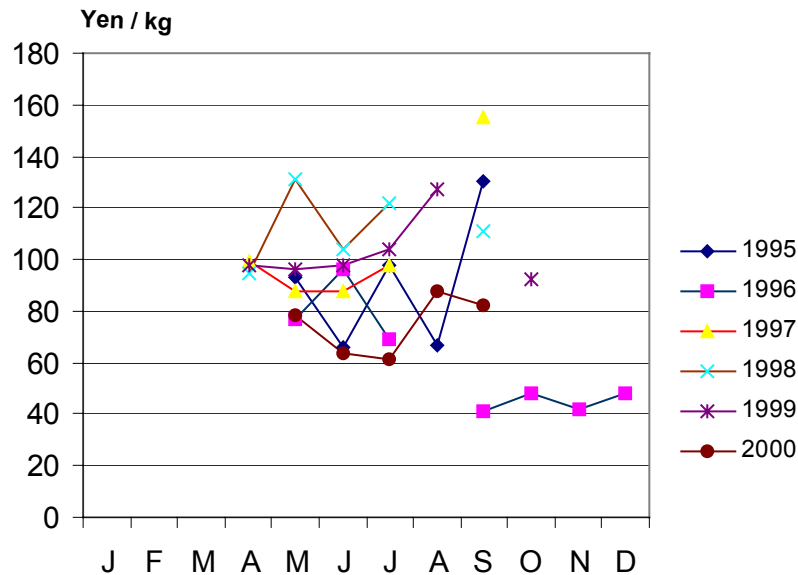
Australia is the high – priced supplier, see Fig. 49.

The fact that Australia supplies in the Japanese summer months of June – July – August and receives the high prices that it does supports the view that at that time of the year the market is really that of the high priced restaurants rather than the low priced noodle manufacturers.

It also suggests that the issue of so-called problems associated with crossing the Equator are not supported by the whole market.

Fig. 49

### JAPAN - Buckwheat. Monthly CIF prices from Australia: 1995-2000



This is not to say that Australia does not have problems. Comments in Japan reflected adversely on issues such as

- On-farm drying.
- On farm storage.
- Movement to Port.
- Port handling and storage prior to shipment.
- On-board handling, especially with regard to the type of container.
- Lack of consistency in volumes.

### Supply – Australia – Summary

However, in view of the market comment that the summer months appear to be the preferred months to supply the soba restaurant industry, then Australia must be seen as being well positioned.

### Supply - Russian Federation

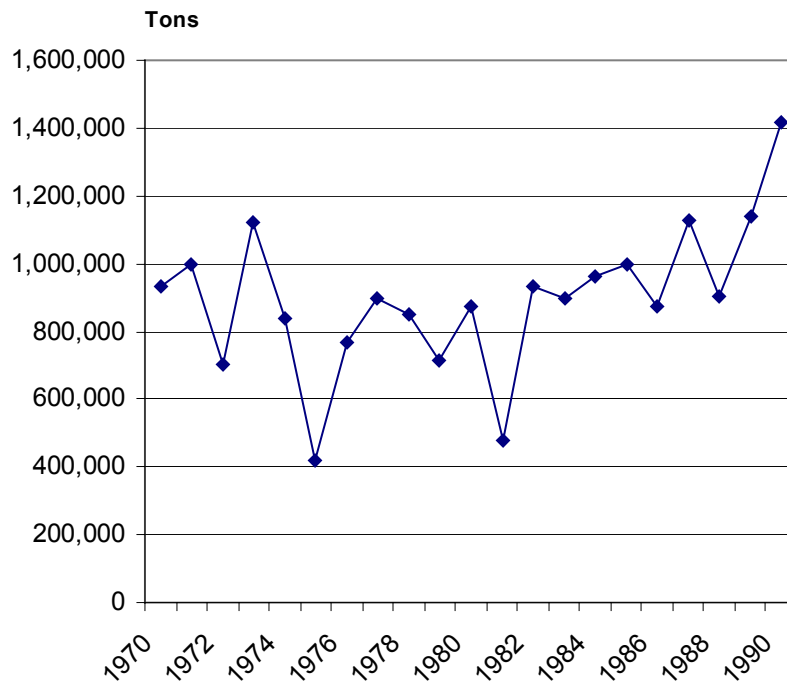
One of the challenges in examining buckwheat production in the Russian Federation is trying to use a consistent definition of the region following the break up of the old Soviet Union. However defined, the Russian Federation is the world's second biggest buckwheat producer.

Longer term data for what was then termed "USSR" from 1970-1990 is shown in Fig.50. This shows a strong upward trend, with production peaking at over 1.4 m t.



Fig. 50

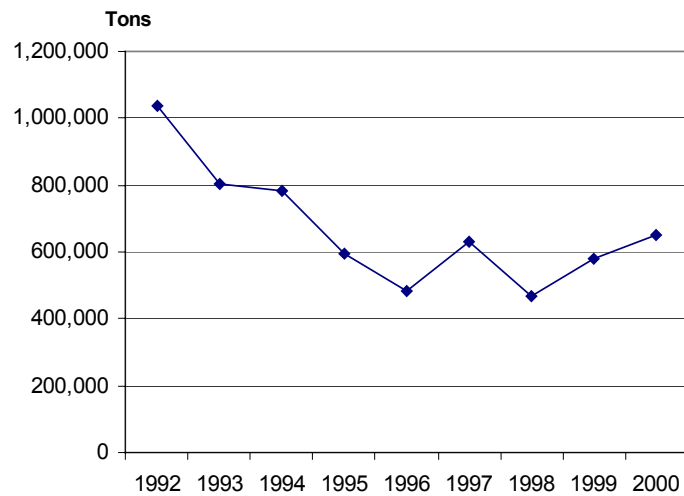
**USSR - Buckwheat.  
Production, 1970 - 1990**



It is difficult to establish the direction of production in more newly defined Russian Federation. On the data available it suggest a downward trend, see Fig. 51, but production has recovered in 1999 and 2000 but it is too early to establish if this is the beginning of an upward trend.

Fig. 51

**RUSSIAN FEDERATION - Buckwheat.  
Production, 1992-2000**



Buckwheat is also a traditional crop in the Russian Federation where it is a popular stock food as well as for human consumption in the form of *kasha*. The decision to feed buckwheat to livestock,

especially pigs, is a very rational one as buckwheat’s high lysine content ensures higher reproduction and thus the greater availability of protein than what could be gained by taking it directly as a human food.

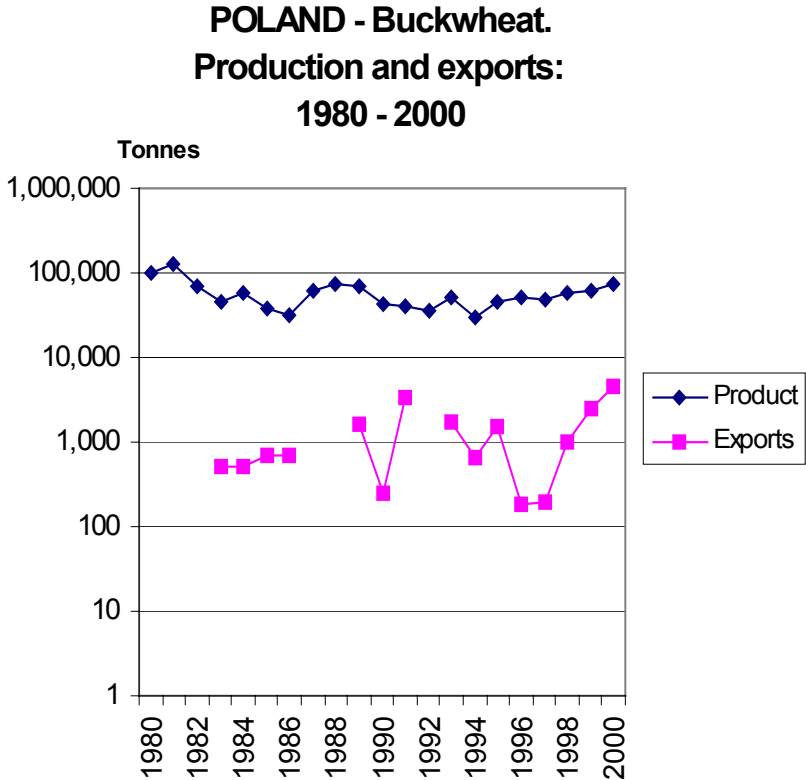
Given these factors, it is considered that the Russian Federation will become an importer of buckwheat.

### Supply - Poland

Poland does not receive much publicity for its production and exports. Nevertheless, its production is about the same as that of at least the United States and, less frequently, that of Canada, see Fig.52. Exports are not as great as those of either the United States or Canada. Further they are quite inconsistent.

The indications are that Poland could be a potential exporter of note. Off-setting this however is the fact that the consumption of buckwheat in Poland in *kasha*-based dishes is a long held tradition and internal demand could account for most production increases.

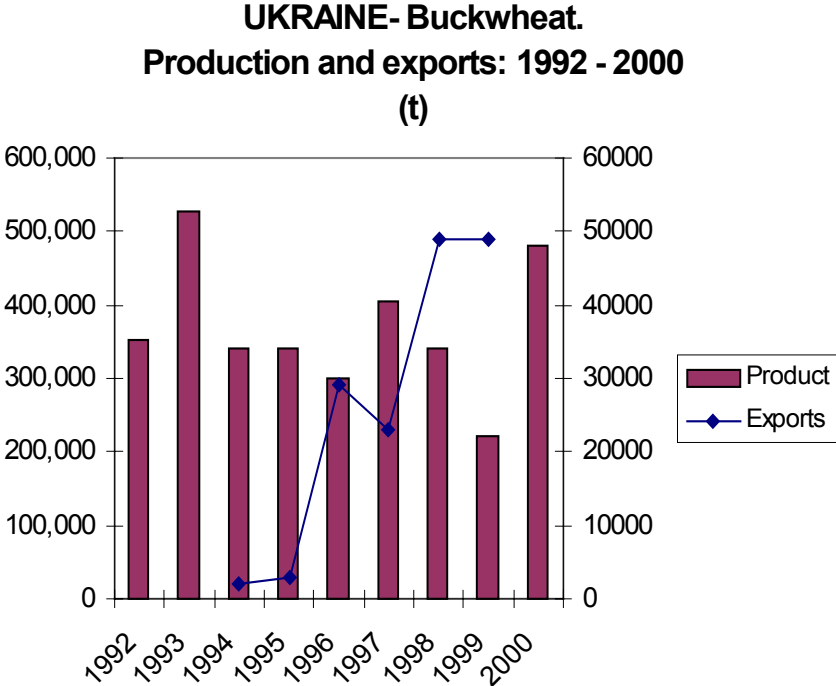
Fig. 52



# Supply - Ukraine

According to FAOSTAT, the Ukraine is the world’s third largest buckwheat producer and the second largest exporter, see Fig. 53.

Fig. 53



Both these claims seem hard to substantiate. With production, it is possible that part of the problem is definitional with the “Ukraine” being considered part of the “Russian Federation”. With exports, it is noted that neither in North America or Japan was any mention made of exports from the Ukraine. It is considered that an exporting country whose exports exceeded by a factor of at least two exports from both the United States and Canada would have least been noted as a potential competitor by the trade in North America<sup>19</sup>.

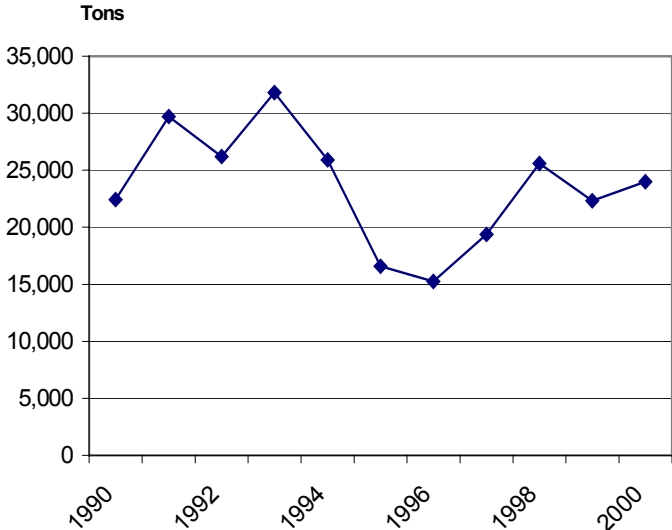
<sup>19</sup> As an aside, there was a request on the web in May 2001 from the Ukraine seeking 30 000 t of buckwheat groats: [www.business-china.com/jdk9909/food/12160.htm](http://www.business-china.com/jdk9909/food/12160.htm)

# Supply - France

France is both a producer, see Fig.54, and, on occasions, an importer having a unique demand for the making of buckwheat crepes in the Brittany region.

Fig. 54

**FRANCE - Buckwheat.  
Production: 1990- 2000**



The 15 nations comprising the European Union produced 24 000 t in 1999-2000. It imported between 29 000 – 36 200 t in the period 1995-1999 whilst at the same time exporting between 9 000 – 11 800 t.

# Appendix 1

## Japanese buckwheat standards

### Regular buckwheat

Grades	Minimum		Maximum			
	Test weight	Perfect Grain	Moisture	Damaged, imperfect, other seed, foreign material		
				Total	Other seed	Foreign material
	g	Percent	Percent	Percent	Percent	percent
No.1	610	95	15	5	1	0
No.2	590	85	15	15	2	0
No.3	570	75	15	25	3	1

Off-grade: the quality that does not apply to Nos. 1 – 3 and contains over 50 percent of other seed and foreign material.

### Regular buckwheat (tetraploid)

Grades	Minimum		Maximum			
	Test weight	Perfect Grain	Moisture	Damaged, imperfect, other seed, foreign material		
				Total	Other seed	Foreign material
	G	Percent	Percent	Percent	Percent	percent
No.1	600	95	15	5	1	0
No.2	575	85	15	15	2	0
No.3	550	75	15	25	3	1

Off-grade: the quality that does not apply to Nos. 1 – 3 and contains over 50 percent of other seed and foreign material.

### Seed buckwheat

Minimum			Maximum		
Test weight	Perfect grain	Germination	Moisture	Damaged and immature seeds	Foreign material
g	Percent	Percent	Percent	Percent	Percent
610	95	90	15	4	1

Packing must be in jute bag, p.p. bags or per bag approved by an agricultural inspector

# Appendix 2

## Canada – buckwheat grades

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	No.1 Canada	No.2 Canada	No.3 Canada
<b>General</b>			
Minimum	58.0 kg/hl	55.0 (kg/hl)	No minimum
Test Weight	285 g/hl	270 g/hl	-
Variety	Any registered variety	Any registered variety	Any registered variety
Degree of soundness	Cool and sweet	Cool and sweet	May have a ground or grassy odour but not musty or sour
<b>Damage</b>			
Dehulled	1.0 percent	2.0 percent	5.0 percent
Immature <sup>A</sup>	2.0 percent	2.0 percent	5.0 percent
Total	4.0 percent	8.0 percent	20.0 percent
<b>Foreign Material</b>			
Stones	3 / 500 g	3 / 500 g	3 / 500 g
Ergot	NIL	0.05 percent	0.25 percent
Sclerotia	NIL	0.05 percent	0.25 percent
Matter other than cereal grains	About 0.2 percent	1.0 percent	2.0 percent
Cereal grain	1.0 percent	2.5 percent	5.0 percent
Total	1.0 percent	3.0 percent	5.0 percent

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<sup>A</sup> Immature defined as kernels that do not contain groat or seriously shrivelled groat.

**Source: Canadian Special Crops Association**  
([www.specialcrops.mb.ca/crops/gradebuck.html](http://www.specialcrops.mb.ca/crops/gradebuck.html))