

Strategy for Protecting Intellectual Property Rights (IPRs) related To Invention and Research Results in Agriculture in Japan

Masaharu Endo
Patent Attorney,
Hiraki & Associates,
Manager of Bio-tech and Chemistry Group,
Japan
Email: endoh-m1401@hiraki-patent.co.jp

ABSTRACT

In Japan, a lot of agricultural producers are eager to develop new varieties of food and foliage plants. Several tools are available in Japan for protecting intellectual property rights related to plants, including plant variety registration (PVR), patents and trademarks. Among them, PVR is the most direct way of covering new plants. Previously, however, PVR was not often used, because of its slow registration process and difficulty in establishing infringement. In the past several years, the government has switched its policy and has encouraged farmers to protect new plants by using PVR, by, for example, helping them to establish infringement. As such, PVR is now becoming a useful tool for farmers. In this paper, several cases in which new plants are successfully protected by using PVR, patents and trademarks in combination, are introduced.

Keywords: IP strategy, patent, trademark, plant variety registration

INTRODUCTION

Agriculture in Japan has a lot of disadvantages, such as small farm lands located mainly in narrow and steep mountainous areas, aging farmer communities, and high cost for farming facilities and labor. Due to these disadvantages, Japanese farmers had long been not very competitive in domestic and international markets, and are not interested in protecting their intellectual properties relating to their agricultural precuts, such as new plant varieties and their precuts' names. The Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF) also had not been interested in such things but instead had been protecting farmers in the markets by, for example, putting a lot of protective regulations.

But recently, the government of Japan has become eager to start free trade agreements with other countries such as the TPP (Trans-Pacific Partnership). The government sees that agriculture in Japan is less competitive in markets compared to other industrial sectors including automobiles and electronics and that it is necessary to strengthen the competitiveness of Japanese farmers enough to be able to make a commercial success in the coming free trade markets.

Under such circumstance, the MAFF has changed their policies and implemented several policies that encourage Japanese farmers to protect their intellectual property rights for

strengthening their competitiveness in the commercial markets. The MAFF sees that, among several measures for protecting intellectual property rights, plant variety registration (PVR) is an important building-block for the development of agriculture.

Previously, however, PVR was not often used, because of its slow registration process and difficulty in establishing infringement. Now, the MAFF has implemented new systems that are friendly for PVR right holders, for example, accelerating examination process and helping them to establish infringement.

In this paper, the author introduces several new policy changes related to PVR and several cases in which new plants are successfully protected by using PVR, patents and trademarks in combination.

NEW POLICIES RELATED TO PVR IN JAPAN

MAFF Intellectual Property Strategy 2020

The MAFF formulated, in May 2015, MAFF Intellectual Property Strategy 2020 (IPS2020) that promotes the building of strategic intellectual property management in agriculture, forestry and fisheries fields.

The IPS2020 lists the following eight points which should be focused on in five years from 2015 to 2020 for heightening the competitiveness of Japanese farmers and food companies:

- (I) Measurements for preventing technology leakage / Brand management strategy;
- (II) Development of overseas markets by using intellectual properties;
- (III) Strategic exploitation of international standards;
- (IV) Exploitation of traditional or regional brands;
- (V) Development on IC tags for using in the fields of agriculture, forestry and fisheries;
- (VI) Strengthening the competitiveness of seeds and seedlings industry;
- (VII) Intellectual Property Management in Research and Development; and
- (VIII) Education on Intellectual Property

Among these points, “(VI) Strengthening the competitiveness of seeds and seedlings industry” is related to PVR. In relation to this item (VI), The IPS2020 explains in more detail what should be done in the five years, which includes “Enhancing protection of new plant varieties”.

Enhancing protection of new plant varieties

Under the title “Enhancing protection of new plant varieties”, the IPS2020 lists the following four specific strategies, (1) to (4), and, under strategy (2), further lists three sub-strategies, (a) to (c).

- (1) International harmonization of examination procedures for PVR, and implementation of the examination procedures
- (2) Enhancement of counter measurements against infringement of plant breeder’s right
 - (a) Enhancement of counter measurements against infringement of plant breeder’s right
 - (b) Enhancement of counter measurements against infringement of plant breeder’s right
 - (c) Enhancement of counter measurements against infringement of plant breeder’s right

- (2)-(a) Supporting plant breeder's right holders to counter infringement activities
- (2)-(b) Developing plant variety identification technologies such as identification using DNA analysis
- (2)-(c) Promoting plant breeder's right holders to use custom seizures against infringed plants imported from or exported to abroad
- (3) East Asia Plant Variety Protection Forum
- (4) Requesting foreign countries to establish reliable plant variety protection system

MAFF Manual for Strategic Intellectual Property Protection

In April 2014, the MAFF formulated MAFF Manual for Strategic Intellectual Property Protection (MSIPP), which is an educational material teaching farmers how to protect and use IPs in relation to agricultural products effectively and showing several successful model cases.

The MSIPP emphasizes the importance of PVR to obtain plant breeder's rights (PBR) for protecting new, useful plant varieties. It also emphasizes that using different types of IP rights in combination, for example, PBR plus patent, and PBR plus registered trade is effective for protecting new plants. Some of the successful cases introduced in the MSIPP are mentioned in this paper.

PLANT VARIETY REGISTRATION SYSTEM IN JAPAN

History and Statistics

Excellent varieties are the foundation of production in agriculture, forestry and aquatic industries, and the breeding of various varieties with excellent characteristics in productivity, quality, disease resistance, etc. is an important pillar supporting its development. Therefore, it is necessary to properly protect the right of the breeder of new varieties in order to actively encourage the breeding of new varieties. For this reason, the plant variety registration (PVR) system based on the Plant Variety Protection and Seed Act (hereinafter called "the Act"), protects the rights of the breeder of a new plant variety and promotes the breeding of new varieties of plants. In this system the right that can monopolize a new plant variety that the breeder is entitled to enjoy is called "plant breeder's right" (PBR).

The Act was wholly revised in May of 1998 in order to expand the scope of the protection of the breeder's right, etc. The revised Act is conformed to the 1991 UPOV Convention (the International Convention for the Protection of New Varieties of Plants) which provides an international rule for the protection of new varieties of plants. Since May 1998, this act has been further amended several times (Table 1).

Table 1. History of PVR system in Japan

Japan	The UPOV Conention
1947 Agricultural Seeds and Seedlings Law	1961 Adopted (entry into force 1968) 1972 Amendment
1978 Plant Variety Protection and Seed Act 1982 Join UPOV 1978 Amendment	1978 Amendment (entry into force 1981)
1998 Join UPOV 1991 Amendment Full amendment on the Act	1991 Amendment (entry into force 1998)

The number of application for requesting PVR is around 1,000 per year in the past several years (see Fig. 1). This application number is the third biggest in the world after Europe (2,736 in 2006) and the US (1,482 in 2006) (Ito, T., 2008).

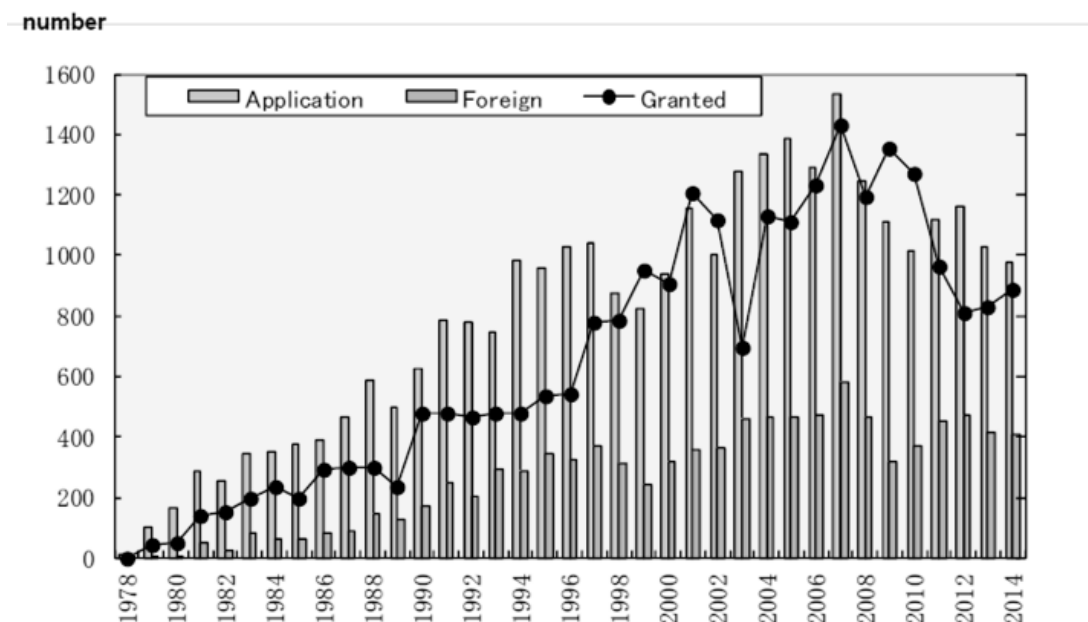


Fig. 1. Number of application and granted for plant variety protection in Japan

This graph is cited from Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2015, "Statistics and Introduction to Our Web-site (New)", <http://www.hinsyu.maff.go.jp/en/about/statistics.pdf>

Among the total annual applications, around 80% is for ornamental plants (such as flowers), around 7% is for fruit crops, and around 5% is for vegetables.

Examination procedure

Applications for PVR are examined by the IP Division of the Food Industry Affairs in the MAFF, not by the Patent Office in the Ministry of Economy, Trade and Industry (METI) which examines patent and trademark applications.

In the PVR system, all plants cultivated, and mushrooms designated by Cabinet Order are subjects of protection. Any person who has bred a new variety (breeder or his successor) may file an application for PVR. Requirements that need to be satisfied are listed in Table 2.

Table 2. Requirements for gaining a plant variety registration

Distinctness	The applied variety must be clearly distinguishable in terms of important characteristics (shape, color, disease-resistance, etc.) from any other varieties.
Uniformity	All of the plants of the variety in the same propagation stage must be sufficiently similar in all of the characteristics.
Stability	All of the characteristics must remain unchanged after repeated propagation.
Novelty	The seeds and seedlings or harvested materials of the applied variety must not have been transferred, in Japan earlier than one year before the date of application, or in a foreign country earlier than four years from the date of such an application (six years, in the case of perennial plants).
Suitability of name	The name of the applied variety should not be one which would be confused with an existing variety name or registered trademark.

Examination of the characteristics of the applied plant variety is conducted to judge distinctness, uniformity and stability (DUS examination). The DUS examination is conducted in one of the following three forms:

- 1) Growing Test;
- 2) On-site Inspection by government officials; and
- 3) Documentary Examination (including international examination cooperation)

The National Center for Seeds and Seedlings (NCSS) has been designated to undertake Growing Tests.

The examination of plant varieties is based on the principle of “actual thing”, which means that what characteristics the applied plant has is examined. This is why the DUS examination is conducted. The plant variety is an actual thing, not an idea. This is a clear difference from the patent system, in which the examination is conducted on the basis of the principle of “technical concept” of an invention, and what are written in documents is examined. In the patent system, the invention need not be realized into an actual product.

On condition that all the requirements are met and the applicant has paid the registration fees, the plant breeder’s right (PBR) is granted and registered. The duration of the PBR is 30 years (perennial plants (woody plants such as fruit trees, forest trees, ornamental trees, etc.) or 25 years

(other plants) after registration (cf. the duration of a patent right is 20 years after filing the application).

Enforcement of PBR

The holder of a PBR enjoys the exclusive right to exploit (produce, sell, offer to sell, import, export, etc.), in the course of business, the registered variety, varieties that are not clearly distinguishable from the registered variety in terms of their characteristics, and varieties whose production requires the repeated use of the registered variety. (Article 20(1) of the Act).

If there was clear evidence that an infringer has stolen the seeds of the registered variety from the PBR holder, it would be easy for the PBR holder to argue that the plant in dispute in an infringing case is “the registered variety.” However, such case is exceptional. In most cases, it is required to prove whether an allegedly infringing plant variety is “the registered variety” or one of “varieties that are not clearly distinguishable from the registered variety in terms of their characteristics”. For showing how close an allegedly infringing plant variety is to the registered, it is basically required for the PBR holder to conduct a comparison test in which the two plants are grown side by side in the same environment to show that, in terms of important characteristics (such as shapes of flowers, leaves and so on), the allegedly infringing plant variety is the same as, or very close to, the registered variety of the PBR holder. The reason why such a side-by-side comparison test is required is that how characteristics of a plant appears are dependent on the environment in which it is grown and can vary from one environment to another. As such it is necessary for the PBR holder to conduct the comparison test to show that the two plants are identical or not distinguishable from each other.

Said comparison test generally requires a long time and costs a lot. For relieving such difficulty of proof on the PBR holder, identification technologies using DNA analysis are now under development. A DNA sequence in the gene that is unique to a plant having a specific characteristic is called “DNA marker”. Detecting a DNA marker is relatively easy and requires shorter time. It is ideal that all the plant varieties registered can be identified by using DNA markers. However, identification technologies using DNA analysis is still under development. Only limited DNA markers are accepted as a valid identification marker for plant variety identification.

The validity of the DNA marker needs to have been confirmed. In a recent court decision by the Tokyo district court of a PBR infringement dispute, November 28, 2014, H21(wa)47799/H25(wa)21905, the PBR holder submitted a DNA analysis result showing that the allegedly infringing mushroom variety of the defendant contains the same DNA marker that, the PBR holder argues, is unique to the registered mushroom variety. However, the court did not accept the DNA analysis result as valid evidence for identifying the registered variety since the validity of the DNA marker selected by the PBR holder had not been confirmed.

RECENT DEVELOPMENTS OF PLANT VARIETY PROTECTION

As outlined in section 1 above, the IPS2020 lists four specific strategies, (1) to (4), and, under strategy (2), further lists three sub-strategies, (a) to (c). In this section, some of the recent developments in relation to these strategies are introduced.

International harmonization of examination procedures for PVR, and implementation of the examination procedures

Acceleration of examination procedures

The examination procedure of PVR used to be slow. The time from filing an application to be granted was 2.9 years on average in 2006. For shortening the time, more examiners have been employed (22 examiners in 2006 / 32 in 2012), and the number of growing tests conducted annually has been risen (613 test in 2005 / 721 in 2010). As a result of that, the average examination time has become to be 2.5 years in 2015. The MAFF sets 2.3 years as a current target. See the MAFF "The status quo of plant variety protection in Japan and other countries" 2013.

International examination cooperation

As shown in Figure 1, the number of PVR applications on foreign-bred varieties is increasing. For more efficient examination, international examination cooperation, in which the MAFF can use the examination result by other countries on the same variety, is important. In recent years, Japan has engaged examination cooperation agreements with UK (1997), Germany (1997), Netherland (1997), Israel (1998), New Zealand (2000), EU (2006) and Vietnam (2007). See the MAFF "The status quo of plant variety protection in Japan and other countries" 2013.

Enhancement of counter measurements against infringement of plant breeder's right

Plant varieties are prone to be infringed because they are easy for illegal infringers to reproduce the plant by themselves. Recently, infringement disputes over well-known, registered plant varieties, such as fruits (strawberry, cherry etc.), flowers (carnation etc.), vegetables (beans etc.), have been reported in newspapers. Typical cases are that seeds or seedlings of a registered plant variety were stolen, and the plant variety was grown in a foreign country in a larger scale with lower labor cost, and are then illegally imported into Japan.

Enforcing PBRs against infringers is very important in protecting the PBR holder's business. However, as explained in the above section 2.3., proving that the allegedly infringing products are within the range of the PBR of the holder is difficult and time-consuming. In addition, since plants are living and always changing, it is difficult for the PBR holders to preserve samples of the allegedly infringing products for identifying what are infringing their PBR in advance to future legal actions such as infringement lawsuit, sending cease and desist letters. Due to these difficulties, PBR holders have often given up enforcing their PBRs, and therefore the number of

enforcing PBRs against infringers has been very small. According to a survey by STAFF (Society for Techno-innovation of Agriculture, Forestry and Fisheries) in 2006, 33.6% of PBR holders (180 / 536) had an experience that their PBR was infringed, but 32% of them having the experience answered that they had not done anything against the infringement act (See Food Industry Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2013).

In response to this situation, the MAFF has started several programs supporting PBR holders to help them to enforce their rights with less difficulty. Specifically, the MAFF established “plant variety protection advisors” supporting PBR holders in the National Center for Seeds and Seedlings (NCSS) in 2005, and also has supported the development of plant variety identification technologies such as identification using DNA analysis.

Plant variety protection advisors in NCSS

The NCSS is a division of the MAFF, mainly conducting the DUS examination detailed above. The same division has assigned plant variety protection advisors (PVP advisors) in 2005 to provide a consultation service for those who have concerns that their PBR may have been infringed. The activities of the PVP advisors are unique and probably have no counterpart outside Japan.

PVP advisors’ major activities are as follows:

(a) Counseling and advice

PVP advisors offer counseling service on infringement of the PBRs such as “someone is propagating a registered variety and selling it without the permission of the PBR holder.” The advisors give advice for the countermeasures that the holders generally take.

(b) Making up records on infringement

The advisors go to the scene with the clients (at home and overseas) to examine the cultivation, storage, and sales of the seeds, seedlings, and other product suspected of infringement, and to create the records. These records can be used as evidence to prove the date, quantity, and money amount for the purpose of establishing PBR infringement.

(c) Deposition of infringement evidence

The advisors store evidence infringing PBRs, such as seeds, seedlings, leaves, DNA and other goods on behalf of the PBR holders, helping them to preserve evidential capacity. When the deposited good is cut flowers, the advisors regenerate the plants with cutting propagation (production of young plants) and keep them.

This deposition system started in 2009. Table 3 shows the number of different types of samples deposited to the NCSS.

Table 3. The number of different types of samples deposited to the NCSS

	Pressed leaf samples	Freeze-dried samples	DNA samples
Total number deposited as of March 2012	1,000	1,680	131
(Samples deposited in FY 2011)	(370)	(480)	(21)

The data are cited from Food Industry Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2013, "The status quo of plant variety protection in Japan and other countries"

(d) Similarity tests

Upon the request of the PBR holders, the advisors conduct similarity tests, which compare the suspicious varieties of the infringement with registered varieties.

The similarity tests include;

- 1) Comparison of characteristics mainly based on visual checks (fee: US\$220);
- 2) Growing test for characteristic comparison on the seeds and seedlings submitted by clients by cultivating them in the same way as the DUS examination for variety registration (fee: around US\$1,260); and
- 3) DNA analysis (Currently only available for some varieties, such as strawberry, sweet cherry and igusa rush. But scheduled to gradually increase target plant varieties.) (fee: US\$333 US).

Through these activities, the PVP advisors help the PBR holders to enforce the right against infringing parties. The advisors can cooperate with the PBR holders in every step in a typical course of counter measurement against infringing activities. See Fig. 2.

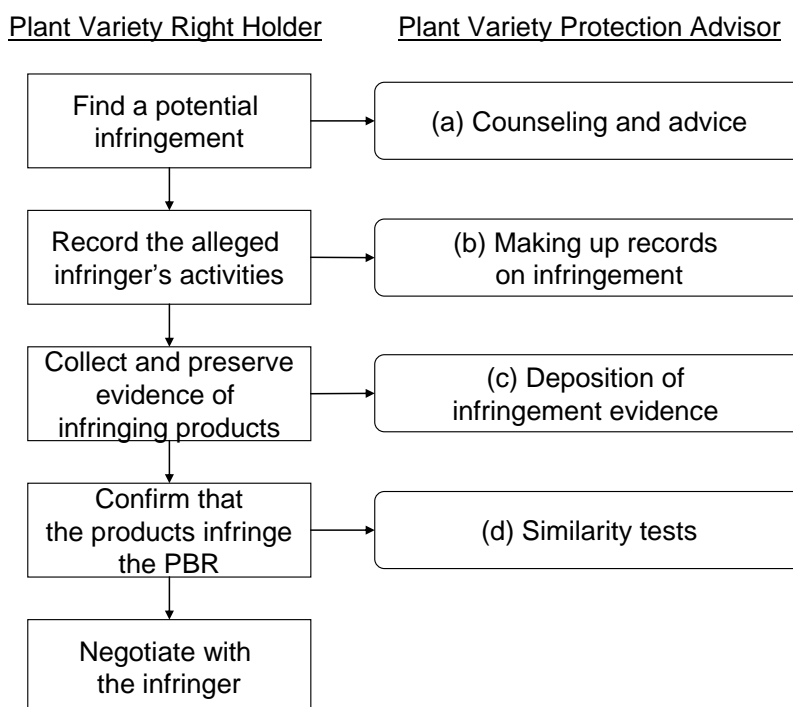


Fig. 2. The advisors can cooperate with the PBR holders in every step in a typical course of counter measurement against infringing activities

Successful case of an infringement dispute cooperated with plant variety protection advisors: Carnation (Tahira, M. 2008)

On “Mother’s day” in May, Japanese people have a custom of sending carnation flowers to their mothers. At the beginning of May every year, carnations are imported mainly from China and Colombia.

This case is related to plant breeder’s rights (PBRs) on four carnation varieties popular in Japan. The PBRs belonged to a group of Japanese and European companies. The group engaged with several Chinese farmers to authorize them to cultivate the carnation varieties in China and export them to Japan. The group requested the Chinese farmers to put a special label, called “Export Approval Certificate (EAC)”, showing that the farmers were authorized to export them, on each package of the exported carnation. If a package of carnation did not have the EAC label on it, it was clear that the package was an infringing product.

In May 2008, at a market in Tokyo, the group of the PBR holder companies together with PVP advisors from NCSS carried out an inspection on cut flowers of carnations imported from China to check whether they were with the EAC label and found several packages without the label. They seized the packages of carnations.

For confirming whether the cut flowers under seizure were infringing their PBRs, the group of companies asked the PVP advisors to conduct a comparison test between the cut flowers under seizure and the registered varieties. The PVP advisors regenerated the carnations with cutting propagation (production of young plants), and using the regenerated carnations, conducted a comparison test.

The PBR holder companies had negotiations with the importer, requested to stop importing the flowers and finally, the importer agreed.

Development of plant variety identification technologies

As explained in the above section 2.3., plant variety identification technologies using DNA analysis is effective, but not yet perfect. For fulfilling the need, the MAFF has been supporting industrial and academic sectors and national research institutes to develop DNA markers useful for plant variety identification since 2006.

As a result of these efforts, the number of useful DNA markers has been increasing. It is reported that it was possible as of 2013 to identify more than 50 varieties of rice, more than 125 varieties of strawberry, more than 85 varieties of cherry and a lot of other plant varieties by DNA analysis. These plant variety identification tests are available for anybody who requests the NCSS. See Food Industry Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries 2013.

Combination of Plant Variety Protection and Trademark Registration

As mentioned in section 2.2., PBR protection term is 25 or 30 years and, once it expires, anybody can produce and sell the same plant variety. Therefore, after PBR expiration, controlling the quality of the plant variety has become difficult, and, the brand value of the variety can be deteriorated quickly.

For avoiding this unfavorable situation, the MAFF has strongly been recommending that the name of the registered plant variety should be protected by trademark registration. Trademark registration can be kept in force indefinitely upon payment of renewal fees every 10 years. The plant breeder can give a license of putting labels showing the trademark on the registered plant variety only to limited farmers in order to maintain high quality and to protect the brand value.

The MAFF has introduced several successful cases in which farmers and plant breeders made a commercial success by using plant variety protection and trademark registration in combination. Some of the cases are introduced as follows:

Case 1: Kiwi fruit (Endo, J., 2011)

"*Zespri Gold*" is a new variety of kiwi fruit, bred by a New Zealand company, Zespri Group Limited (ZGL). ZGL has a PBR on *Zespri Gold*, as a variety name "Hort16A", registered in 2005 in Japan. ZGL also has several trademark registrations on "*Zespri*" or "*Zespri Gold*". Since in Japan and in New Zealand seasons are opposite, the fruit can be supplied all year round from either Japan or New Zealand.

In 2001-2004, ZGL gave a license of producing the variety to around 440 farmers in Ehime Prefecture and around 160 farmers in Saga Prefecture, western Japan. ZGL requested the farmers to put a label showing the trademark "*Zespri Gold*" on each piece of the kiwi fruit produced under the license.

In order to let people know the brand "*Zespri Gold*", ZGL conducted a lot of sales promotion activities on TV and other places.

As a result, not only ZGL but also the farmers in Ehime and Saga have made a commercial success. See Table 4 showing the production outcome of kiwi fruit in Ehime Prefecture. As shown in the table, on sales base, around 20% of kiwi fruit was *Zespri Gold*, in Ehime Prefecture, in 2008. Unit price of *Zespri Gold* is US\$5 per kilogram, much higher than US\$3.5 kilogram of kiwi fruit average, reflecting that the kiwi fruit variety has obtained a high brand value in the kiwi fruit market in Japan.

Table 4. The production outcome of kiwi fruit in Ehime Prefecture

	2005	2008
<i>Zespri Gold</i> in Ehime	Production: 258 tons Sales: more than US\$1.4 M	Production: 1,300 tons Sales: more than US\$6.8M Share in Ehime: 20% (sales) Unit price: US\$5/Kg
Kiwi Fruit in Total in Ehime	Production: 8,300 tons Sales: more than US\$28 M	Production: 9,600 tons Sales: more than US\$34M Unit price: US\$3.5/Kg

The data are cited from Endo, J., 2011, "Enhancing the Effectiveness of the PVP System in the Next 10 Years" Symposium on Plant Variety Protection, 13-15 July, 2011, Seoul Korea

Case 2: Strawberry (Mitsui H. and Suenobu S., 2010, and the MAFF website)

In Japan most prefectures have their agriculture research centers, which are researching breeding useful plant varieties and livestock animals suitable to the environmental conditions of the prefecture. "*AMAOU*" is a new variety of strawberry, bred by the research center of Fukuoka Prefecture.

"*AMAOU*" is characteristic in that it is much bigger and sweeter than conventional strawberry varieties. Fukuoka Prefecture filed an application for a plant variety protection over *AMAOU* in 2001 and obtained a PBR in 2005. The prefecture also holds a PBR in China too. The purpose of holding the PBR in China is mainly to prevent illegal production of the registered strawberry variety in China.

Fukuoka Prefecture gave a license to JA, the largest farmers association in Japan, of producing "*AMAOU*" on condition that JA sells the seedlings of the variety only to farmers in Fukuoka Prefecture. Accordingly, only farmers in the prefecture can produce and sell *AMAOU*.

Fukuoka Prefecture has also developed a variety identification method of *AMAOU* using DNA analysis, by which it is easily detected whether a strawberry is *AMAOU* or not.

In 2002, JA obtained a trademark registration on *AMAOU*. JA also obtained trademark rights in Hong Kong, China, Korea and Taiwan.

The prefecture and JA conducted a lot of commercial promotion activities in Japan and Asian countries/regions such as Hong Kong, Taiwan, Singapore, Thailand, US and Russia.

As a result, *AMAOU* has made a big commercial success. According to the website of Fukuoka Prefecture, in fiscal year 2014, its sales amounted to US\$144 million (the second among all strawberry varieties in Japan), and its unit price reached to about US\$13.5 per Kg (the first among all strawberry varieties, for 11 years in succession). According to the MAFF, 2015, "The points of MAFF Intellectual Property Strategy 2020", the price in shops in Tokyo in 2014 was about US\$8 USD per package (300g), and about US\$6 per package in Thailand.

AMAOU has succeeded in building a position as a luxury fruit in Asian regions.

Plant Variety Protection in Foreign Countries by Japanese Breeders

As shown Figure 1, PVR applications for foreign-bred varieties occupy a large proportion of the total applications in Japan, around 40%. According to Ito, T., 2008, the total number of PVR applications was 1,358, among which 440 applications were from foreign countries, specifically, 141 were from Netherlands, 77 were from Germany, 65 were from the US in 2006. See Table 5.

Table 5. PVR applications in Japan by foreign nationalities in 2006 (from Ito 2008)

Total PVR applications	1,358
PVR applications by foreigners	440
Netherlands	141
Germany	77
United States	65
United Kingdom	25
Australia	10
China	7

The data are cited from Ito, T., 2008, "Review of plant variety protection system in foreign countries", *Patent* Vol. 61, No. 9, pp. 32-41

On the other hand, the number of outbound PVR applications going to foreign countries by Japanese applicants is not very big (see Table 6). In 2006, there were 230 outbound PVR applications. Although this statistics is not new, the situation today is similar.

Table 6. PVR applications in foreign countries by Japanese in 2006 (from Ito 2008)

Foreign PVR applications by Japanese	230
United States	63
EU	58
Canada	33
Korea	31
Australia	5
China	3

The data are cited from Ito, T., 2008, "Review of plant variety protection system in foreign countries", *Patent* Vol. 61, No. 9, pp. 32-41

Since a lot of research institutes of national and local governments in Japan are now struggling financially, they are in general unwilling to file PVR applications in foreign countries, which are cost consuming. But, in Japan, most of the economically important plant varieties have been produced by these governmental research institutes. If they had not obtained PBR for an important variety outside Japan, any party could easily grow the variety there, and the products could be illegally imported to Japan or other countries. Such cases have already emerged.

Table 7. Types of PBR holders in Japan (as of March 2016)

Seeds and Seedlings companies	53%
Individuals	27%
Prefectures in Japan	10%
National government of Japan	4%
JA (farmers' association)	1%
Other companies	5%

Data from the MAFF website

The government sees that the current situation needs to be changed. The MAFF is now considering starting a new program of subsidizing PVR applications to foreign countries on condition that the applications are directed to important varieties bred in Japan, and requesting budget for the program, US\$3 million. The MAFF has set a target of increasing the export of products of agriculture, forestry and fisheries from US\$7.4 billion in 2015 to US\$10 billion in 2019.

CONCLUSION

The government of Japan sees that it is necessary to strengthen the competitiveness of Japanese farmers enough to be able to make a commercial success in the coming free trade markets. Under such circumstance, the government has changed their policies and implemented several policies that encourage Japanese farmers to protect their intellectual property rights for strengthening their competitiveness.

The government sees that PVR is an important building-block for the development of agriculture, and has implemented new systems that are friendly for PVR right holders, for example, accelerating the examination process and supporting the right holders to establish infringement of their rights. In addition the government has provided information of successful model cases that farmers should know and follow. As a result of these activities, farmers in Japan have greatly enhanced their consciousness about IP protection. But, plant variety protection outside Japan by Japanese plant breeders is still not satisfactory and needs to be promoted more.

REFERENCES

- Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2015, "MAFF Intellectual Property Strategy 2020",
<http://www.maff.go.jp/j/press/shokusan/sosyutu/pdf/150528-01.pdf>
- Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2015, "The points of MAFF Intellectual Property Strategy 2020",
http://www.maff.go.jp/j/kanbo/tizai/brand/b_senryaku/pdf/senryaku_point.pdf
- Ito, T., 2008, "Review of plant variety protection system in foreign countries", *Patent* Vol. 61, No. 9, pp. 32-41
- Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2015, "Statistics and Introduction to Our Web-site (New)", <http://www.hinsyu.maff.go.jp/en/about/statistics.pdf>
- Ministry of Agriculture, Forestry and Fisheries (Government of Japan), "The Plant Variety Protection System in Japan", <http://www.hinsyu.maff.go.jp/en/about/overview.pdf>
- Ministry of Agriculture, Forestry and Fisheries (Government of Japan), "The outline of Plant Variety Protection System", <http://www.hinsyu.maff.go.jp/en/about/outline.html>
- Endo, J., 2011, "Enhancing the Effectiveness of the PVP System in the Next 10 Years" Symposium on Plant Variety Protection, 13-15 July, 2011, Seoul Korea
- Mitsui H. and Suenobu S., 2010, "Development of AMAOU strawberry and protection of intellectual property", *Tokugikon*, 2010.1.29, No. 256, pp. 49-53

Tahira, M., 2008, "Infringement disputes in the field of agriculture and fisheries / Support for enforcing plant breeder's right", *Patent* Vol. 61, No. 9, pp. 19-22

Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2014, "Manual for Strategic Intellectual Property Protection",

<http://www.maff.go.jp/j/press/shokusan/sosyutu/pdf/140407-01.pdf>

Food Industry Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries (Government of Japan), 2013, "The status quo of plant variety protection in Japan and other countries",

http://www.maff.go.jp/j/study/shokbutu_hogo/01/pdf/data2.pdf

Fukuoka Prefecture, 2015, Official website of Fukuoka Prefecture,

<http://www.pref.fukuoka.lg.jp/press-release/topamaou20141121.html>

Submitted as a resource paper for the FFTC –MARDI International Workshop on “*Effective IP Protection and Commercialization Strategies for Agricultural Innovation*”, Oct. 18-20, MARDI Headquarters, Serdang, Selangor, Malaysia