

Patenting and Licensing Papaya Cultivars ?

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I am an intellectual property specialist at the at the University of Hawaii in the Office of Technology Transfer and Economic Development. This is a long name that basically means we attempt to commercialize and protect the new technologies and ideas that are coming out of the university. As an intellectual property specialist at OTTED, I work with inventors to patent their inventions.

Today I would like to speak to you about patenting, or the potential to patent, papayas. I think that at some point in time this could become an extremely important issue for all of you. What I would like to do today is introduce some of the basic concepts involved.

At some point in time you, as an industry, will have to come together and decide what to do about protecting new papaya varieties. You are going to have options whether to patent or not to patent. You may want to protect the developments created within Hawaii and keep them for Hawaii; or maybe you are going to decide to license them out to other countries. The anthurium growers right now are going through this exact type of decision-making process. It is a long, hard process for some of them, and learning from that experience is why I am here today. I am here to help to introduce you folks to the thought process and inform you so that you can slowly, in the back of your minds, prepare yourselves for the decisions that you are going to have to make some day.

Before I start into patenting I would like to do a little commercial for our office. I feel that perhaps we may be able to help some of you, and you may not know exactly who we are. OTTED's office is presently on Oahu. We have four basic offices; I am in the intellectual property section. Intellectual property is basically patents, trade marks, and copyrights. My job is to patent, trademark, or copyright the new ideas coming out of the university.

We also have three other programs. We have a seed capital program for people who are involved with the university who have good ideas. They can submit a proposal and get \$5,000, \$10,000, \$20,000; even up to \$250,000 has been awarded. If

any of you are connected with the university, this type of money is available to develop high-technology projects.

Another program that we have is an economic development and education program. This program primarily develops software within the university to help educate people outside the university. For example, we have a few programs in the works that are plant-oriented, botany-type software programs in which somebody is working on Hawaiian medicinal plants. There are very interesting ideas that we are working on in this program.

Last but not least, for those of you who are not involved directly with the university we have a technical assistance program. This program may be able to help some of you. The general public can come to our office if you need some sort of technical assistance or if you have a particular idea that you would like to develop. Our office will connect you with the appropriate professor or expert in their field within the university and they in turn will connect you with the person that can best help you with your needs. A lot of times, all you need to do is sit down with someone who is top in their field when you have a question or an idea. Sitting down with them for an hour or two can really make a big difference and be just what you need.

That is it for the commercial. Now we will get down to talking a little bit about patents and plants.

There are basically three types of protection for plants. The type of protection will depend upon the way that the plant was developed or created. The first type is the plant patent. Plant patents were originally introduced into the legislature in about 1930. The purpose was to grant plants the same type of protection that is offered every other type of invention. A second purpose was to give the developer of a new variety of plant the security to immediately come into the market at a low price because he knows he is going to be protected.

The plant patent protects new and distinct varieties of plants that can be reproduced asexually. This means that only asexual plants are

produced, without seeds. Any type of reproduction that is not using seeds is protected by the plant patent. With this patent you can restrict others from propagating new varieties through asexual means. This does not protect your seeds. It only protects the plant itself. There are about 8,000 plant patents since the 1930's. Primarily they are covering roses, because people want to protect their rose plants commercially.

In the papaya industry, I don't see the plant patent as the particular type of patent that you would want to use. It may be useful in some terms, but generally I think we are going to look to the plant variety protection certificate or the utility patent.

The second type of protection is the utility patent. This is used for your typical invention. Let me compare and contrast the difference between the plant patent and the utility patent. The utility patent is something that would be used more for Dr. Manshardt's type of discoveries, where the new papaya is a result of genetic engineering. The utility patent is not generally for biological materials. However, the biological materials that are being covered by the typical utility patent are genetically engineered biological materials.

If all this work being done on genetic engineering can now be patented by a utility patent, what does that mean? With a utility patent, you can restrict others from making, using, and selling the patented invention. More importantly, you can prevent someone from importing, using, or selling products of a patented process. Therefore, you have control to keep these products from coming in or going out of the country. Thus, you are starting to move into international control. If you have some genetically engineered papayas and you only want them in Hawaii, utility patents can prevent them from moving back and forth internationally. The patent could give quite a commercial edge.

The third type of protection is the plant variety protection certificate. This is possibly an appropriate form of protection that would be applicable to the papaya research that is going on at the university. This protects new varieties of sexually reproduced plants. The certificate was developed in the early 1970's by the U.S. legislature. The reason behind creation of the certificate was that seeds were not being protected. You could protect the plant, you could protect asexual reproduction, but people were moving seeds freely.

The plant variety protection certificate gives the ability to protect seeds, and requires certain

certifications on the seeds. This could be an applicable form because papayas are generally reproduced by seed.

What are the advantages of the plant variety protection certificate? You can restrict others from selling, offering, reproducing, importing and exporting, propagating or even hybridizing for the next the 18 years. Once again you have very good protection with the certificate.

Let's take a look at some of the requirements and the procedures involved in the patent process. For the plant patent, the variety must be distinct, novel, and unobvious. This is legal language that basically says it has to be a new plant invention. The procedure is that the U.S. Patent and Trademark Office reviews the invention and decides if it is distinct, novel and unobvious. This process takes about 2½ years.

As for the utility patent, which is used for the typical invention, the invention must also be new, useful and unobvious. In the papaya field this would apply to genetic engineering. Anything that is genetically engineered is fairly new and unobvious. Again, examination by the Patent and Trademark Office takes about two years. In the genetic engineering field you are lucky if you can find a patent examiner that can go through the process in two years. It will actually take about three years to get it through. The cost is about \$5,000 for one country. If you want to patent in Japan, that may be another \$5,000 to \$10,000 dollars. If you additionally want to patent in Holland or the Philippines, you are talking about another \$5,000 each country, so it can become quite expensive.

Finally, for the plant protection certificate the variety must be new, distinct, uniform, and stable. It cannot be changing, it must breed true. The examination is by the U.S. Department of Agriculture. The certificate is not a patent. The U.S. Department of Agriculture processes the certificate. That is nice because they are more efficient than the Patent and Trademark Office. The cost is considerably less - approximately \$2,000. Often it comes in under that cost.

The protections that you can get from these various forms of protection grant you certain rights. Once you have these rights you have the option to license. For those of you who do not understand the term "license," it basically means to sell with the reservation of certain rights. For example, if you had a plant variety protection certificate on the seeds of a certain papaya that is virus resistant, you could sell the seeds to someone

outright. If you sell the seeds outright to someone, they can sell the seeds to anyone else they want. However, once you have this type of protection you can license the seeds to someone and reserve the right that only they use these particular seeds. Or, you could reserve the right that they will not cross breed or interbreed. Or you can reserve any particular type of rights you want. That is the concept of licensing. It can be a powerful tool in protecting the industry in Hawaii. However, nothing is free. There is a cost benefit analysis that you as an industry as a whole will have to consider.

Let's look at the advantages of getting a patent or certificate. It will allow the Hawaii growers input into control over university developed cultivars. It is the policy of our office to follow the desires of the industry, whatever industry is involved. We have the option to do what the inventor wants, but for the good of the state we always go to the industry itself and ask for their opinion. We try to follow the industry's opinion regarding patents or other types of intellectual property protection. This is your way to give input into these decisions. Some people want patents, some people don't want patents because they find the process too cumbersome.

Another advantage of a patent or certificate is that it can give you the legal foundation to prevent propagation and sales by others. As I said, that is a very powerful tool. It gives Hawaii growers the potentially competitive advantage over other people who may not have these type of inventions.

A final advantage is that patents can create revenue through licensing, which can be returned to further research. For example, perhaps you want to charge a penny or two per packet of seeds based on a patent. That is called a royalty. You can decide that people in Hawaii get seeds royalty-free, while people outside of Hawaii pay 5 cents. The royalties charged are split: half goes to the inventor at the university, half goes back to our office to pay for the patenting or the plant certificate costs. A lot of the inventors put a major portion of their royalties back into research. If it came from papayas it goes back to papayas. It is pretty much a win-win situation for everyone with royalties.

However, let's look at some of the disadvantages. Nothing is free. The costs of a patent or a certificate can be substantial. As I said, you are looking at anywhere from \$2,000 to \$5,000 per country. You want to target your countries. Realistically speaking, the cost could be between \$5,000 and \$20,000 for the appropriate protection

that you might seek. Sometimes our office will pay the money up front, sometimes we'll seek at least a portion of the money from the industry itself. Every situation is different, but one way or another the costs will be paid eventually from the royalties. The royalties come from either your pocket or someone else's pocket who is buying the seeds or plant, so there is a cost involved.

Another disadvantage is that a patent or plant variety protection certificate can be difficult to enforce. If you go to Thailand and tell them, "Those are my seeds and you are growing my plant," they simply will say, "Call a cop." There are certain places where you are not going to be able to enforce your rights. On the other hand, there are many places that you will be able to enforce them, especially some of your larger markets. The way these things work is pretty much the way it works with books. Everyone knows that there is a copyright on books, but people copy portions of them anyway. However, you do not copy the whole book. The big players have a tendency to respect these type of intellectual property rights. Japan will respect these rights, Singapore will respect these rights. That is where your value lies.

Finally, the idea of cooperation could be an advantage or a disadvantage. It depends upon how you look at it. Cooperation is required among the industry to make these type of decisions. I know the anthurium growers are going through great turmoil trying to make a cohesive decision, but they will prevail to their advantage. I don't know in particular if it would be such a painful ordeal for the papaya growers. Such decisions require cooperation and cooperation requires time and energy.

That is about it, those are the issues that eventually you will face at some point in time. It may be next year, two years, or whenever, before something develops. Eventually we will come to you and ask the industry to start to think about these types of decisions. Hopefully this will warm you up. Are there any questions?

Q: Are there any varieties of papaya that have been patented?

A: None that I know of at this particular time. None through our office, anyway.

Q: Does the plant patent protect the seed or the papaya industry? Is it legal for someone to buy the seed that is protected by the plant patent and grow the seed and sell the product?

A: The plant patent does not protect the seed. The plant patent would protect from someone going out and doing tissue cultures or something like that, anything but the seed. Now in the case of genetic engineering, you would actually end up getting a plain old (utility) patent and that would

protect everything, seed, plant, you name it, because it is in the typical utility patent realm. The thing to remember between the plant patent and the plant variety protection certificate: the certificate protects the seed, the plant patent protects the plant.

FORM OF PROTECTION	PROTECTS	OWNER'S RIGHTS	REQUIREMENTS AND PROCEDURES
1. PLANT PATENT	Distinct and new varieties of plant that can be reproduced asexually.	Can restrict others from propagating the new variety through asexual means.	<ul style="list-style-type: none"> • The variety must be distinct, novel and unobvious. • Examination by the U.S. Patent and Trademark Office (USPTO) takes about 2.5 years. • Cost About \$3,000
2. UTILITY PATENT	Inventions and improvements (including biological materials and genetically engineered organisms).	Can restrict others from making, using, and selling a patented invention or importing, using, or selling the products of patented processes for 17 years.	<ul style="list-style-type: none"> • The invention must be new, useful, and unobvious. • Examination by the USPTO takes about 2 years, on average. • Cost About \$5,000
3. PLANT VARIETY PROTECTION CERTIFICATE	New varieties of sexually reproduced plants.	Can restrict others from selling, offering, reproducing, importing, exporting, propagating, or hybridizing the new variety for 18 years.	<ul style="list-style-type: none"> • The variety must be new, distinct, uniform, and stable. • Examination by the U.S. Department of Agriculture (USDA) takes about 1-1/2 years, on average. • Cost about \$2,000

Table 1. Alternatives for plant variety protection.