

ANATOMY OF A SPECIALTY CROP - THE ADZUKI BEAN EXPERIENCE

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INTRODUCTION

As research scientists, we wish to emphasize that technology appears to be the least important facet in the development of a specialty crop. A second point to emphasize is that Murphy's Law is almost certain to apply: If anything can go wrong, it will.

This paper, therefore, will not be strong on technology; the technology exists to get the job done. In order to apply the technology, it is necessary to deal with people. When people begin to smell money or glory or whatever it is that they smell, they cease working together to get the job done. They each look out for themselves, tending to become secretive, and when something goes wrong, as it will, they look for someone to blame.

HISTORICAL

The adzuki bean (*Vigna angularis*) has been grown and used for many centuries in the Orient. It was introduced to Japan from China about 1000 years ago. Its principal use throughout the Far East is as a confectionery item. It is cooked and combined with varying proportions of sugar, water, starch, plant gums, and other ingredients, and consumed as such or in combination with other foods. The single largest use of these so-called "ann" products is as fillings for bread (ann-pan), steamed breads or dumplings and sweet cakes. At least 50 other beans and legumes are also used to make these pastes, but the adzuki bean is the most prized, in large part due to its desirable red color, but also due to a delicate flavor and to the characteristic grainy texture of the pastes made from it.

THE ADZUKI BEAN COMES TO MINNESOTA

As early as 1962, Dr. Robert Robinson of the University of Minnesota, Department of Agronomy, began yearly field trials of adzuki beans and began to systematically make selections for large seed. In February 1977, a representative of the Mid-America International Agri-Trade Council (MIATCO) proposed at a meeting of the Red River Edible Bean Growers Association that adzuki beans be produced by farmers in Minnesota. This action came from a suggestion by a Japanese Trading Company, Tokyo Maruichi Shoji (TMS).

TMS shipped about 300 pounds of 'Takara' variety adzuki bean seed to North Dakota State University; about 135 pounds of this was planted in Minnesota in 1977. Another shipment of 'Takara' was obtained from TMS in 1978 by the Bonanza Valley Seed Growers Association. In 1978, Jim Sutherland, working at the Staples Area Vocational Technical School as a Marketing Specialist for the University of Minnesota Agricultural Extension Service, accompanied State Commissioner of Agriculture Bill Walker and others to Japan as part of a trade

mission. It was suggested by TMS officials that an attempt be made to process the adzuki beans in Minnesota, because raw adzuki beans were (and still are) import quota (I.Q.) items, whereas processed beans were not.

In February 1978, Jim Sutherland contacted Dr. Bill Breene of the University of Minnesota Food Science and Nutrition Department about the possibility of making "ann" products in the United States. Breene's reply was that it would be essential to have a native Japanese food scientist working on any such pilot project, because, it is impossible to judge the quality of a virtually totally unfamiliar product; and second, most of the scientific literature was in Japanese. Dr. Breene recalled that Dr. Isao Hayakawa, Assistant Professor of Food Science and Technology at Kyushu University in Fukuoka, had written him in June 1977 expressing a desire to spend a sabbatical year at Minnesota, but he required support money. Dr. Breene had also been in continuous contact with an astute free lance food industry consultant in Japan, Mr. S. Yasufuku, since 1973. Mr. Yasufuku visited Minnesota in April 1978 and again in October 1978 to discuss possible adzuki liaison between Minnesota and Japan.

Breene and Sutherland submitted a three-year demonstration project proposal to the Governor's Rural Development Council (GRDC) in May 1978. It was built around demonstrating the feasibility of making ann in Minnesota from Minnesota grown adzuki beans using the full-time assistance of Dr. Hayakawa and consulting assistance provided by Mr. Yasufuku. First year funding was approved in July 1978.

A loose consortium of the Minnesota Department of Agriculture, the University of Minnesota, the edible bean growers organization, the GRDC and others began to form.

Dr. Leland Hardman joined the University in 1976 as an Extension Agronomist working in the bean and soybean areas. He included adzuki beans in his test plots from 1977 on.

Dr. Breene visited Japan in September 1978. Mr. Yasufuku arranged meetings with Dr. Hayakawa, Dr. Kaoru Inagami, a former adviser of Dr. Hayakawa at Kyushu University who had made the move to food industry research, and others. Mr. Yasufuku arranged tours of small, intermediate, and large scale adzuki bean processing plants. He introduced Dr. Breene to many adzuki bean products in small and large shops and obtained books and literature on the subject, all in Japanese, of course. The definitive work on the subject was a book entitled "The Ann Handbook"; one of its authors was an ann manufacturer named K. Matoba.

Dr. Hayakawa arrived in Minnesota in October 1978 and began work on the project. About this time, articles on the romance between Minnesota and the adzuki bean appeared in The Farmer and The Wall Street Journal. The latter, especially, caught the attention of growers, prospective growers, the food industry, venture capitalists, opportunists, entrepreneurs, fast-buck artists, and even some snake oil dealers.

In December 1978, Breene, Hardman, Robinson, Dick Meronuck (Dept. of Plant Pathology), Gene Pilgram (Program leader, Agricultural Extension), Jim Sutherland, Orville Gunderson (Minnesota Area Extension Soils Specialist, at Morris), Jerry Wright (Extension Irrigation Engineer), and Jack Morris (Pope

County Extension Director) met to discuss a broad spectrum of recommendations that needed to be made concerning adzuki bean production, processing, and marketing in Minnesota.

Back in Japan, Mr. Yasufuku was beginning to identify ann manufacturers who might be willing and suitable to engage in some sort of joint venture with a Minnesota partner who would also be suitable. This is akin to scheduling a wedding by a marriage broker who has neither a male nor a female client.

Perhaps it is appropriate to point out here that the key to launching a new or alternative crop is to first identify markets, preferably by contract, and second to identify individuals in the production/processing/marketing chain who are trustworthy, solvent and willing to grow gradually as dictated by the markets. The participants cannot be the university, the government, etc., but must be in the private sector. The difficulty is in finding participants who are neither too big nor too small. For example, General Mills and Mitsubishi could team up and handle an adzuki bean/ann venture; both could afford the necessary promotional efforts and both could afford to absorb losses during start up. The problem is, these companies are simply too big to consider such small initial markets. On the other end, there are companies (or individuals) having a sense of adventure and willing to take risks in hope of hitting the jackpot, but most of them are simply too small to do the job. They are understaffed, undercapitalized, and not capable of swinging it. In between, there are some companies that are close to being the right size. Those that could swing it probably got where they are the hard way and are too smart to take another dip in the quicksand. This creates a vacuum into which a very interesting mixed bag of politicians, opportunists, adventurers, pirates, brigands and blackguards is plummeted.

Mr. Yasufuku visited Minnesota in February 1979, accompanied by Mr. Hashimoto and Mr. Kuwahara, both ann manufacturers. They invited Breene and Sutherland to come to Japan and visit their factories. Mr. Kuwahara promised to arrange for a visit to a factory in Taiwan. During these discussions, it became obvious that an Agronomist was needed for discussions with the Japanese, because Japanese farming systems, and agronomic terminology, can differ sufficiently from ours and cause a lot of confusion. It was decided to bring Professor Hardman into all major discussions with the Japanese.

POLITICS - THE ADZUKIGATE AFFAIR

In November 1978, Minnesota elected a Republican governor which meant a new Commissioner of Agriculture, which meant a new Chairman of the GRDC. Bill Walker was out and Mark Seetin was appointed Commissioner. Barrett Schlenk, the International Trade Representative, arranged for a trade mission to Japan and Hong Kong for March 1979. Breene, Sutherland, and Hardman, (B, S, and H) elected to join this group for cost reasons (lower air fare and hotel rates for the package deal) and because Mr. Schlenk and Mr. Seetin could join in discussions with the Japanese. Mr. Seetin had not yet been confirmed by the legislature as Commissioner, but there seemed to be no known impediments.

Mr. Yasufuku arranged a complete itinerary, which included discussions with key people in several Japanese trading companies, an all day tour and discussion at Hashimoto Seian Company in Kobe (Seetin and Schlenk included), discussions with

the Assistant Agricultural Attache at the U.S. Embassy, discussions with Dr. Inagami, and an opportunity to interview Dr. Yusuke Asano (Meiji Milk Products Co.), who had written to the Food Science Department about two weeks earlier inquiring about the possibility of spending a study/research leave there. Dr. Asano eventually came to Minnesota in August 1979 to work on the project until October 1980. Dr. Inagami stated that he had assisted Dr. Jean Lambert in obtaining seed of a large-seeded soybean variety several years back. He promised to obtain adzuki bean seed for the Minnesota project and he delivered later in the year. Hayate, Sakae, and also Takara seed thus made its way into Dr. Hardman's trial plots.

Now it happened that a Minnesota farmer was on the trade mission, along with twenty odd other people, most of whom took the trip to exhibit at trade shows in Tokyo and Hong Kong. During the one week spent in Tokyo, B, S, and H would disappear to their respective prearranged meetings. This farmer became noticeably frustrated. It turned out that he had made the trip to investigate the adzuki bean situation, but having few contacts, he assumed he would be invited to the prearranged meetings. There were good reasons for not including him, first, one does not bring uninvited guests to business meetings with Japanese hosts. Second, B, S, and H did not at that time know the purpose of his trip anyway. It was during this period that others in the group began to jokingly refer to B, S, and H as the Adzuki Mafia. In turn, Mr. Yasufuku dubbed himself the Adzuki Godfather.

The trade show group flew to Hong Kong on St. Patrick's Day, 1979. B, S, and H then arranged to fly on from Hong Kong to Taipei, Taiwan. There, according to Mr. Kuwahara, they would be contacted by his representative and flown to Kaoshiung where they would visit farms and processing plants. They were among the first Americans to go to Taiwan after President Carter had instituted the One China policy and pulled out the U.S. Embassy. This trip might be called "The Taiwan Caper".

B, S, and H were contacted on the evening of their arrival by two Taiwanese gentlemen who mentioned no flights or tours, but agreed to a meeting in one of the (small) hotel rooms between 11:00 pm to 2:30 am. Accompanying the Taiwanese was Mr. Matoba, one of the authors of the Ann Handbook and owner of a sizeable adzuki bean processing company in Tokyo. It was a very strange and confusing meeting, but it appeared that Mr. Matoba had arrived unexpectedly, short-circuiting any plans that Mr. Kuwahara may or may not have made. We learned about two years later that Kuwahara, Hashimoto, and others were in one friendly group of ann makers and Matoba and some others were in another friendly group, but the two groups were not exactly friendly with each other, although the former group sometimes purchased Taiwan ann from the latter group. However, nobody from the Kuwahara/Hashimoto group was ever allowed inside the Taiwan factories, so it appeared that Mr. Kuwahara had set up B, S, and H as pawns to gain access and information that was not available otherwise and that the caper failed. Whether or not it failed due to the unexpected arrival of Mr. Matoba will never be known.

Very shortly after the trade mission returned to Minnesota, the disgruntled farmer and a businessman who had also made the trip in an unsuccessful attempt to sell products in the Far East initiated Adzukigate. They notified Twin Cities print, radio, and T.V. media that they had important revelations to make

at the meeting of the joint Agriculture Committees of the Minnesota Legislature. They accused Mr. Schlenk and Mr. Seetin of drunkenness and debauchery. The only truth in the accusations was the indisputable fact that Mr. Schlenk, after hand-carrying the passports of most of the tour group participants to Seattle to obtain visas just prior to leaving for Tokyo, was suffering from a cold along with exhaustion and on the nine-hour flight from Seattle to Narita had consumed some medications that did not combine well with alcoholic drinks. He needed some assistance in going through immigration, customs, etc, but this was a Saturday evening and was no impediment to the performance of any of his duties. The whole "news" event (non event, actually) was apparently politically inspired.

It was not long before the phones of B, S, and H, who were never accused of any high jinks, began to ring. All of the newspapers, T.V. stations, radio stations, etc. began to inquire. Dr. Hardman even received a phone call from the CIA which was merely doing random interviews of recent visitors to Taiwan following the closing of the U.S. Embassy. Special hearings were scheduled at which a letter from Mr. Yasufuku to one of the troublemakers was read into the testimony. Mr. Seetin and Mr. Schlenk were eventually cleared of all charges by a retired judge who was appointed as a Special Investigator. There were further political efforts to shut down the GRDC project, e.g., it was vetoed by the Western Regional Development Commission (the home turf of the two troublemakers) and B, S, and H were obliged to justify the project to the Lieutenant Governor.

The project was continued for the three-year period with Dr. Asano working during 1979-80 and Kazuhiro Takamine, a former student of Dr. Hayakawa working during 1980-81.

PRIVATE SECTOR ACTIVITIES - PRODUCTION

In 1979, a farmer in Iowa planted a large acreage of adzuki beans with no idea of how and where he would market them. He held them for several years and sold them to an entrepreneur who did not pay in a timely fashion; the whole mess ended in a lawsuit. Several named varieties were obtained from a major Japanese seed company by Dr. Inagami and shipped to Dr. Hardman. The Minnesota Crop Improvement Association rushed Dr. Robinson's selection into the private sector as a named variety, Minoka (the original seed came from Oklahoma). In 1979, approximately 7500 pounds of foundation seed of the Minoka release was produced. In 1980, this seed was distributed to registered and certified seed growers in Minnesota and became extinct. The reasons for this failure included disease, inexperienced growers, poorly adapted soils, harvesting problems, and possibly others.

Dr. Hardman worked to obtain herbicide labeling and clearance for adzuki beans. He made recommendations as to the proper soil type for growing the crop. They do not grow well on heavy, poorly drained, high pH soils. Despite the fact that adzuki bean production advice was available from Dr. Hardman, some farmers with no experience in growing dry, edible beans, let alone adzuki beans, got into the act. Some adzuki beans were planted on the wrong type of soil in Southeastern Minnesota resulting in a total crop failure. Guess who got blamed? The local news media were informed that the University of Minnesota was encouraging the production of a crop that was not suitable to be grown in Minnesota. At least one newspaper report appeared and no doubt it was aired on local radio stations.

Remember the disgruntled farmer who assisted in the fabrication of the Adzukigate Affair? He turned up again in 1981. As a Director of a cooperative that processed sugar beets, he had made contact with Toyomenka, a fairly large Japanese trading company. Toyomenka had apparently purchased some sugar from the cooperative. Sugar is a major ingredient in ann, thus, the connection. This individual contracted with Toyomenka in 1981 to grow adzuki beans. The details of the transaction varied somewhat depending on the source of the information, but they most probably were the following. The grower contracted to plant adzuki beans and received \$50 per acre up front. This is apparently a common method of contracting for crop production in Japan. A major problem was that the beans were planted on the wrong type of soil.

Dr. Hardman learned about the problem in mid-July and informed Dr. Breene. The farmer had not consulted anyone at the university or any County Extension Specialists as to the wisdom of planting the crop in that soil type. Dr. Breene immediately contacted Mr. Yasufuku. The message was that this particular crop was likely to fail which could have serious repercussions, i.e., the word would spread in Japan that adzuki beans cannot be grown in Minnesota. Mr. Yasufuku conveyed this warning to his friends at Toyomenka. In a few days, his phone began to ring off the hook; he received calls from Toyomenka-Osaka, Toyomenka-Tokyo, Toyomenka-Nagoya, etc, etc. Toyomenka had just sent someone to Minnesota to inspect the crop. His report read in part "all of the trees are dead" and "Minnesota is unsuitable for adzuki bean production".

Breene, Sutherland, and Hardman were then contacted by a person in Toyomenka's San Francisco office. Further discussions turned a potential catastrophe into an advantage; Toyomenka contracted, U.S. style, with experienced growers for 200 acres of adzuki beans in 1982. The U.S. style contract called for payment at a specified price based on grade upon delivery of the product.

It first appeared that adzuki beans were plagued with almost no diseases and indeed, they are fairly tolerant of many diseases which afflict Phaseolus vulgaris beans. Several years into their expanded production a disease began to show up. It was first misdiagnosed as a Fusarium. Diseased material was taken to a faculty person in the University of Minnesota Plant Pathology Department who identified the disease as being caused by a bacterium Pseudomonas adzukiola. This person published a paper on it but did not give any credit or acknowledgment to those in the field who had first recognized that a unique disease had appeared and had provided him with the research material.

Production acreage increased from a few acres in 1977 to several thousand acres in the mid 1980s. Then, since growers planted seed from their own crop, the problem of seed borne disease became more of a problem. For acreage to continue to grow, even if there were assured markets, the seed industry would have to initiate a disease-free seed program. Both time and money are required to do this. We are faced with a circular problem: there isn't enough adzuki bean volume for the seed industry to get involved and the crop cannot be grown in large volume if the seed is not available.

Much more could be related in order to illustrate problems in the production side when a new crop is struggling to establish itself. The market is the engine that drives any new crop, so let us examine some of the interesting problems that were encountered in attempting to process and/or market adzuki beans.

PRIVATE SECTOR ACTIVITIES - PROCESSING/MARKETING

When the first news releases went out and as the GRDC project developed, various individuals and groups in the U.S. and Japan inquired and many jumped in. Mr. Yasufuku wisely cautioned against forming joint processing ventures with Japanese trading companies because they are accustomed to dealing with raw products and would probably not be able to properly judge the quality of ann.

Among the U.S. companies that were too big, interest was shown by General Mills, International Multifoods and Sara Lee. At least three different groups in the Pillsbury Company contacted our research group individually at different times. These were, generally, fishing expeditions.

Several canning companies showed interest, including Green Giant (not yet a part of Pillsbury), Big Stone, and Owatonna. Among the restaurants showing interest were the Fuji-Ya and the Good Earth restaurants, both of which still include adzuki beans in some of their menu items. Food Producers International, a manufacturer of fruit syrups and fruits for yogurt, looked into the possibility of manufacturing ann. The George A. Hormel Company was contacted about possibly using adzuki beans in some of their products, i.e., chili. Their response was friendly but their decision was "if it ain't broke, don't fix it." However, this company was made aware that good quality beans of the varieties that they were using could be obtained in Minnesota. Previously, Hormel had purchased most of their beans from the Pacific Northwest. Two sugar companies, American Crystal and Min Dak expressed an interest in the ann project because of the large sugar component in the finished products.

Early in the project, a Twin Cities manufacturer of tofu expressed an interest in manufacturing ann and made a trip to Japan in 1980 to discuss a joint venture with Mr. Hashimoto. These discussions led to the signing of a joint venture agreement which provided for the company to produce ann which would be purchased by Hashimoto's company. No ann was ever produced by the company although they did get into the raw adzuki bean business, contracting for 1000 - 2000 acres, the produce of which was sold through their retail sales channels. The company also purchased some of the adzuki beans grown by the farmer in Iowa.

The project drew the attention of at least one venture capitalist, a Minnesota banker, who met with Mr. Yasufuku and Mr. Hashimoto in Japan and in Minnesota. These discussions did not bear fruit.

Two major obstacles became apparent. The first was the regulatory obstacle, i.e., the import quota on raw adzuki beans, even though imports were required to meet demand. The way around this was to ship ann to Japan. This brought up the second obstacle: transportation costs. Mr. Sutherland and Mr. Yasufuku calculated all possible modes of shipment such as rail to the West Coast, barge to New Orleans, ocean freight CNF and CIF and ocean freight via so-called non-conference vessels. Even at the cheapest possible cost, Taiwan, the Philippines, and China were much more favorably situated than Minnesota.

Another way to attack the freight cost problem would be to produce a good quality dried ann which could be rehydrated in Japan. If the cost of drying were low enough relative to the cost of transporting water to Japan, sufficient savings might be realized to make ann production in Minnesota profitable.

Attempts were made to spray dry ann in the Coulter and Niro pilot model spray dryers in the Food Science Department. Because of the high sugar content, the dried product was sticky and hard to collect. Further, the Coulter dryer was equipped with a pressure atomizer which severely damaged the starch granules. The Niro has a centrifugal atomizer which separated the adzuki bean starch from the sugar/water phase going through the drying system.

Several hundred pounds of ann produced in the U. of M. pilot plant by Dr. Hayakawa in 1979 were taken to Fond du Lac, Wisconsin and dried by DEC, International in their Filtermat Spray dryer which was equipped with a two-fluid atomizer. This was an excellent product. Samples were sent to Japan and Mr. Hashimoto got so excited that he immediately flew to Minnesota along with Mr. Yasufuku. The Filtermat equipment worked ideally, but represented a hefty capital investment and was not easily accessible on a custom basis. Ralston Purina had a Filtermat dryer in Hager City, Wisconsin which was available for custom work but there were scheduling problems plus the fact that somebody other than Ralston would have had to make the ann.

A lot of work was done to make dried ann using conventional drying equipment. Some acceptable products were produced in the Niro pilot plant at Hudson, Wisconsin. A Twin Cities company called Maxum Engineering also had a pilot model spray dryer with a two-fluid nozzle, but the company went bankrupt before the trial drying runs were completed.

It was learned very early in the project that although adzuki bean ann is the Cadillac of ann, about 50 other bean types are used to make ann. However, the various types of white beans (navy, Great Northern, etc.) probably constitute the second most popular raw material for ann making. White ann is popular, per se, and also it can be colored red, green or as the customer desires.

One of the, if not the, premier white ann companies in Japan is the Akafuku Co. Dr. Breene was contacted in 1980 by a young woman (native Minnesotan) who had read one of the newspaper reports on the ann project while in town for a visit. Her husband was in Japan and had been giving English lessons to Mr. Hamada, President of Akafuku Co. She offered her husband's services to make an introduction to Mr. Hamada for which she wanted to collect a consulting fee. Dr. Breene contacted Mr. Yasufuku who simply went to the Akufuku Co. for discussions. Mr. Yasufuku described the aspiring "consultant" as "a young man somewhat hippelike having unclean shirt and unpressed suit. He is a small guy like a piece of adzuki bean in the whole company (Akafuku Co.)". During the discussions "all people just ignored him". It was at this meeting that Mr. Yasufuku found out about Mr. Hamada's connection with Mr. Matoba and the factory in Taiwan and finally understood why B, S, and H had been, in Mr. Yasufuku's words, "kicked out" in 1979. Hamada/Matoba and Hashimoto/Kuwahara were members of rival processing groups.

In 1981, the food technologist who had conducted the ann drying trials at Maxum Engineering announced that he had entered into a partnership with a former Professor of Food Science at the University of Minnesota and a Ph.D. Food Scientist (U. of M. graduate) to purchase a defunct dairy plant near Rochester. Their intent was to undertake innovative food processing such as ann production. The company was called Innovative Food Processors, Inc. (IFP). The equipment in their newly obtained plant included vats, pumps, heat exchangers and a somewhat ancient, but functional Bufflovak spray dryer. After about a year of

discussions, an agreement was signed by the IFP partners and Mr. Hashimoto; B, S, and H signed as neutral signatories. Under the agreement, Mr. Hashimoto would furnish some specialized equipment and teaching about how to make ann. IFP would purchase beans, produce dried ann, and ship it to Mr. Hashimoto in Japan. This was the closest shot at the establishment of an adzuki bean processing operation in Minnesota. But, as in horseshoes, close doesn't count.

There were a number of unforeseen problems. A major problem was that the old Bufflovak dryer just did not have sufficient capacity to do the job. Production got underway during one of the hottest periods of summer; high humidity of the drying air along with low dryer capacity was a sufficient bottleneck. Things backed up and the manufactured ann began to ferment before it could be dried. Another problem was that each of the three partners was still holding down another job, and the young man who was hired to manage the operation, though capable, was not in a position to make some of the decisions that needed to be made.

The relationship between IFP and Hashimoto ended in a lawsuit and counter-suit which was eventually settled amicably. However, it should not have been entered into in the first place. This is an example of a company that was too small. The good news is that although equipment problems and cash flow and capitalization problems forced IFP out of the ann business, the company survived. One of the original partners went to work full-time, bought out the other partners interests and succeeded in other product and custom processing areas.

Despite all of the frustrations that were encountered, the adzuki bean still lives as a "potential" specialty or alternative crop for Minnesota and elsewhere. Recently, there has been an influx of inquiries about it. Fortunately, perhaps because of an alert team of firefighters, the adzuki bean did not suffer the sort of ignominious death which struck down the Jerusalem artichoke.

CONCLUSIONS

The bottom line in specialty crop endeavors is that the private sector has to make it go or not go. There is very little control over private entrepreneurs and their individual or collective activities. Practically all of the failures, and we have mentioned only some of them, were caused by hasty starts and short cuts on the path to fame, glory, and riches. Even though we can understand and anticipate crop production, processing and marketing problems, we can seldom assist people in solving the problems. Why is this so? Communication (actually, a lack of it) is a big factor. People tend to be secretive so as to garner the lion's share for themselves.

Some medical analogies might be appropriate. Here are a few.

1. If one plans to venture into an area rife with diseases, one should get medical advice and immunizations.
2. If one contracts an illness and doesn't seek medical attention, one will be in trouble.
3. If the ill person goes to the doctor but doesn't relate the symptoms, he/she will be in trouble.

4. If the ill person obtains medical advice, but ignores it, he/she will be in trouble.
5. If the ill person goes to a quack, he/she will be in trouble.
6. If the ill person gets advice from a friend in order to save money, he/she will probably pay more.
7. If the ill person dislikes the doctor and undertakes self treatment, there will be trouble.
8. If there is no cure for the disease, avoid infected areas, vectors and carriers.

Good luck with your specialty crop endeavors. One thing is certain. You will meet a lot of interesting, even fascinating people out there.