Seed saving.

‘An unedited excerpt from…’

A PRACTICAL INTRODUCTION

TO THE AUSTRALIAN DEMETER BIODYNAMIC METHOD OF FARMING.

CHAPTER V

SEED SAVING

In conventional Botany, plant breeding proceeds from "male" and "female" parts arbitrarily portrayed as existing in the flower. One could likewise take one part of the male reproductive system and call it "female" and other parts "male".

The ***real*** **female** side is **Mother Earth**, which today is detrimentally compacted, made to dust, poisoned. Under Bio-Dynamics, a slow change of metamorphose-like character takes place: potatoes are healthier after several years than when first introduced, wheat becomes stronger. The appearance of plants in uprightness, colour, aromas, health, increases -

In Bio-Dynamics, we are breeding from the true female side.

Below is a talk given to the BDAAA AGM 2003
by Darren Aitken ©

FOREWORD

Late last spring I had a visit from Alex, who had Greg Kitma, a person Alex has spoken of before, in tow with him and he was coming to look at a few market gardens with Alex. I put together a package of seed for Greg Kitma to take back with him to the Philippines. In the process of labelling that seed and giving it to him there was a general conversation about maintaining the vigour and viability of the seed stock as well as keeping those varieties pure. I guess from that conversation that Alex must have thought that I had something to offer. Either the next morning or the morning after that I got a phone call about 6.30am. The running joke in our house is that if the phone rings before 7.00am that it is either Alex or someone has died. This time it was Alex and in the way that he does he asked me but also insisted that I speak at this AGM regarding seeds.

INTRODUCTION

We are going to deal with the practicalities of seed saving today but there are a lot of diverse and concerning issues regarding seeds that are worth mentioning; genetic modification and the totally ludicrous pursuits of that we don't really need to go in to. Most people are pretty well versed in that, and if you are not, there is plenty of information around. Plant Breeder's Rights is another issue that is fairly dear to my heart. There is an office set up in Australia that was set up by the Government called the 'Plant Breeder's Rights' Office but after a certain number of years it had to become self-funding and self-perpetuating. Because of that reason they are very lax in what they view as breeding because they need to keep the ball rolling along and they need to keep the money coming in.

What's happening in that area? Multinational companies and government organisations or an amalgamation of both, travel the world and collect grain and food crop varieties from countries like Pakistan, Afghanistan, all through the Middle East.

They bring them back out here, give them an Accession Number and put them away in the freezer for two or three years. They pull those out and they grow them and do what any normal person would do regards collecting seed; they select strains of that particular grain or food crop plants that are performing the best. They grow those out again and then go before the Plant Breeder's Rights Office, pay their fee, get those plants registered and theoretically they have private ownership of genetic material, and each time that seed is bought by a grower the owner gets a royalty. An apt term that is used for this process is bio-piracy. I find it totally abhorrent and that in hand with what I guess is generally a silent monopolisation of food seed stocks by five or six multinational companies, is another method I feel of general control that is being put into place by governments and bureaucrats. Multinationals are buying up seed companies. The company name may not necessarily change, they may have been small companies or family companies such as Yates used to be. They will continue to trade like that but what you will find is that 'open pollinated' varieties which is the only type of plant that is of use for a seed saver to perpetuate, slowly disappear. What you are faced with is the multinational companies introducing their lines of hybrid seed that you have to buy year after year.

I haven't done much research on this for a while. Ten years ago there were some hybrid tomato varieties available but at that time it cost $12,000/kg to buy. Most of the labour, which is highly intensive, is done in what we would typically call third world countries where wages are at best scant. This is probably one of the main reason why I save seed. It enables me to maintain my independence. I have grown vegetables, starting in the home garden approximately eight to ten years ago, and for six years now I haven't bought seed at all (have swapped seed though). I have had the same varieties and I have been perpetuating them and using them time and time again. With the new laws coming in requiring certified seed it really worries me that it presents a chance for these multinational corporations to get a strangle hold on the organic industry by only making available certified organic hybrid seed, which you are basically going to pay through the nose for.

The other reason I save seed is that I firmly believe that it is an integral part of any sustainable farming system. To think otherwise never entered my mind. The practicalities of seed saving really don't involve that much more work. The hardest part is actually sourcing your original stock. There are two or three (maybe more) small family owned seed companies still operating in the country that have good stocks of non-hybrid seed. It takes very little effort to grow this seed out and only takes a 20 metre long bed. You grow the seed out and trial it. In that process you will find some natural selection takes place. Some plants exhibit traits that are undesirable and some will even die out. Some are more prone to disease and pest attack. These are rogued out, culled, and you need to breed from the best.

Probably the most difficult plant I have found to obtain good non-hybrid seed stock was *Brassica's*. I have three different varieties at the moment; one of those is promising to be a very good performer. I rescued it. It is a broccoli called Verdante. I just happened to come across a lady who had owned a seed company that had subsequently closed down. I mentioned the difficulties of *Brassica's* and she sent me a packet. There were twenty odd seeds and I think five were still viable. From those five that came through I had to work with what I had. It has taken now three years of growing, selecting and avoiding contamination by cross pollination which we will come to a little bit later.

A. GETTING STARTED

For me open pollinated seeds are the only ones of any use.

Hybrid seeds[20] are nowdays so highly interbred in a process that is called 'selfing' – inbreeding of the parent plant again and again. So much so that we used to say that if you collected the seed of a hybrid and sowed it you would get a mixed bag; all the characteristics of the parent plants. It is so highly bred now days that the seed from an F1 hybrid[21] is sometimes non-fertile, you won't even get a strike.

To grasp pollination is probably the most important factor in maintaining the purity of the variety that you are growing. We need to do a little bit of basic plant nomenclature and I can give you some examples to simplify this.

The plant kingdom has a **family** (not important for this exercise);
a **genus**;
a **species**, and then
a **named cultivar** (or variety).

I will use *Brassica oleracea* as an example.
Brassica is the **genus**,
oleracea is the **species**.
Within that species you have the **variety** -
- broccoli (*var. italica*),
- brussel sprouts (*var. gemmifera*),
- cabbage (*var. capitata*),
- cauliflower (*var. botrytis*),
- kale (*var. acephala*), and
- kohl rabi (*var. gongylodes*)

All of those plants will cross with one another.

Anther *Brassica* species is *Brassica napus* - canola.
Brassica napus will **not cross** with *Brassica oleracea*.

Crossing within the plant kingdom is species specific.

Another good example are *Cucurbits* - the pumpkin family.
There are three major types of cucurbits:
a) you have your *Cucurbita maxima*, which is your big Queensland Blue or Triamble pumpkins – they will all cross with each other.
b) *Cucurbita moschata* is the butternut pumpkin. It won't cross with *Cucurbita maxima* pumpkins.
c) *Cucurbita pepo* is the zucchini or squash. It won't cross with either the *moschata* or the *maxima*, but it will cross with all other varieties of *Cucurbita pepo*.

[20] Hybrid - Plant (or animal) resulting from a cross between parents that are genetically unlike; often restricted to the offspring of two different species or of well-marked varieties within a species. Hybrids may be fertile, or sterile. The more distant the genetical relationship between parents the greater is the probability that hybrids will be sterile (sterility is due to failures in pairing of chromosomes in meiosis).

[21] F1 - Technical term given to the offspring of a specific plant (or animal) crossing.

B. POLLINATION AND MAINTAINING PURITY

Pollination occurs when pollen from the "male" part of the flower is deposited on, and accepted by the "female" part.

Most of our vegetables have the male and female parts on the same flower, and these are called **complete flowers**. Cucurbits and Corn are exceptions to this, in that they have the male and female parts on different flowers, but both of these still occur on the same plant.

In some complete flowers self-pollination occurs. This is where the pollen is transferred from the male to the female within a single flower. Even so you must remain vigilant as a small percentage of natural cross-pollination may occur.

Other complete flowers need cross-pollination. Depending on the species, this may be from flower to flower on the same plant; or from plant to plant; or both. They are cross pollinated by an external influence - usually insect, wind, or man.

How do we maintain purity of the variety we are growing?
There are several different ways.

a) If they are self-pollinators, you grow them apart. (Suggested isolation distances are available for different varieties.)

Some of us have the beauty of being totally isolated. No one for kilometres and kilometres, and I envy those people. If you grow only one variety of one species, the isolation alone will do the job for you. Insects will pollinate amongst that variety. You let the fruit grow to maturity and there is your pure seed.

b) Another method of isolation is isolation over time. Successional planting with only one variety flowering at any given time.

c) Another method – the one I use for cross-pollinators - is hand pollination. It is the only way that I feel happy that I can be guaranteed (99%) that nothing has crossed with the varieties that I want to grow.

I'll use pumpkins as an example (but this also applies for Zucchini, Cucumber, Melons ie. members of the Cucurbit Family.)

I go out in the evening while there is still a bit of light. I can tell by the tip of the flower which ones are going to open the next morning. I tape the flowers up of say five females [the flower that has the small pumpkin (ovary) on the bottom of the flower] and I tape up twenty male flowers. The following morning, preferably before there is too much insect activity, I cut the males off and collect them – that's my pollen source. I collect four or five of the twenty at random, expose the pollen, then go to the female and untape that. The flower opens up and I pollinate with four of the males because you want to create as much genetic diversity as possible, and tape the female back up so that nothing else can get to it. After a short period of time she has accepted that pollen and the process of the fruit setting has started. It will then not accept pollen from any other plant. I mark the fruit with a stake/flag and because I am a 'one man' operation and my girls and wife come out when they can, they know that a stick with a red flag is a 'no go'. Anyone who harvests that – their life is not worth

living. That's the seed for next year. So things like pumpkins require a little bit of work.

Brassicas are a different story.

If you are in an area where brassicas are grown intensively it can only take a stray side shoot from someone else's crop to destroy the integrity of the variety of your seed. I try and cage mine. There is special cloth available that allows the flow of air but will exclude insects. You can physically get into the cage and transfer the pollen. With brassicas it has to be from one plant to another as they have a chemical barrier that won't allow them to accept their own pollen. If you are growing two varieties of the one species you can cage both and remove the cages on alternate days to let the insects work each variety individually.

Legumes

The legume family, peas and beans in particular, are self-pollinators. They are natural in-breeders. More often than not the pollination with a legume has occurred before the flower has even opened. You need a small amount of distance between varieties, as the odd curious insect may get into the flower and transfer pollen. With the peas and beans you can basically grow a few varieties at any one given time and be relatively assured that the variety is going to remain pure. I only grow two varieties of beans; one is a coloured seed and one is a white seed. So it remains very easy for me to determine whether there has been any crossing at all, and in the process of collecting and harvesting the seed I can ditch them into a jar for the soup.

Other self-pollinators like tomatoes have the male and female part of the flower so close together that it can take as little as a bird flying past or a breath of wind for the male to deposit the pollen on the female. Tomatoes are a quite safe variety to grow for saving seed.

[The Biodynamic Gardener's Association through Rod Turner has also got a very small, easy to understand 35 page book from the Henry Doubleday Association who are seed savers in England. It goes into a bit more detail about actual flower parts and complete flowers, incomplete and all those types of things and is an interesting read[22].]

C. SELECTION AND HARVESTING

The criteria for selecting your seed or what plants you are going to breed from is pretty simple; vigorous, healthy, disease and pest resistant plants would be the plants that you would choose to breed your seed stock from.

How many do you actually need to sacrifice, if you want to use that term, to let them go to full maturity regards zucchinis, cucumbers, beans, and that type of thing, is a question to which there is no firm answer. For instance, I kept 20kg of butternut pumpkins (10-15 pumpkins) this year to keep the seed from. Out of probably 500

[22] Available from: Rod Turner, BDGAI c/- 15 Dianne Street, Doncaster East Vic 3109 cost $6 which includes postage.

tomato plants I probably kept 20-25 fruit; and with beans I probably left a section of 5 - 10 metres of plant material. It really depends on how much seed you need. You don't need to keep a lot to get a lot of seed. Ten broccoli plants full of seed will probably be enough to last you a lifetime. You can literally get thousands of seeds out of one broccoli plant.

When to harvest them is quite important.

You want the seed to reach full maturity on the bush. And in the case of peas, beans and broccoli - that are broadly termed the 'dry seeds' - they can dry all the way through on the bush until the pods are basically crispy. That's harvesting time, but they require more drying. In the case of beans you can sit on the front veranda and individually shell them out if you wish. Or put them into a hessian sack, hang them up from the rafter, beat them with a broom, tip out the seed and what you will get is the seed in with a deposit of material from the outer shell. I either then sieve it or winnow it in the wind and the wind will carry away the debris and the seed will fall into the container. Dry for another 2 – 4 weeks, depending on the temperature.

The dry seeds are the easiest to harvest and there are a couple of other tricks with some other seeds.

Pumpkins and zucchini – I let the fruit go to full maturity on the vine and when I harvest it I will just sit the fruit in the kitchen for about another four to six weeks because the seeds will continue to mature after harvest time. It is as simple as when you want to make your pumpkin soup to scoop out the seeds, wash them in a colander and put them in a nice warm room to dry for, dependent on the temperature, anything from two to four weeks. You can just about tell that they are ready to put away when a little cellophane type coating comes off the top of the seed.

With fruit like cucumber and tomatoes there is a process of cleaning involved that also rids the seed of any type of soil-born disease (which is highly unlikely in a bio-dynamic situation) that it may have.

Tomatoes – you pick them very ripe and sit them in the kitchen again until they are nearly mush, until they are so soft that they are ready to split. You squeeze the pulp and the seeds out into a container and you let them ferment. The fermentation process will start and you will get a white, probably mycelium, form on the top of the container. About two or three days after that, tip them into a sieve, wash them off, and what that fermentation process does is it eats away the jelly coating on the tomato seed. After fermentation the coating is no longer existent and you wash the seed and put it out on some towelling paper and you will have perfectly clean tomato seed. You also undertake that process with cucumber and any other variety that has moisture/liquid in with the seed.

There is another treatment for seeds to kill any seed born diseases. That is to place them in hot water and maintain a temperature of about 50 degrees for 25-30 minutes. That hot water treatment will also cleanse the seed. I have only ever done that a long time ago when I started sourcing my original stocks and was perhaps somewhat dubious about the source of the original seeds.

D. STORAGE

The most important aspect in maintaining the viability and vigour of the seed is the storage. It is absolutely fundamental to getting that seed to germinate the following year. The biggest destroyers of seed are light, moisture in so much as not drying the seed properly, and probably the greatest one is fluctuations of temperature. An acquaintance of mine who had some very valuable bean seed left it in a drawer of his office in his shed, through summer, winter and summer and winter again – two years. The viability of the seed after having to go through the fluctuations of the temperature was zero. Not one seed germinated.

We need a brief explanation of viability and vigour or vitality. Viability is purely the ability of the seed to germinate. Because a seed is viable doesn't necessarily mean that it has vitality and vigour. To me the vitality and vigour is more important. The vitality is the ability of the plant to push through the soil once it has germinated and to continue on all the way through into a fruitful, useful product at the end.

To put a figure on it about 4 degrees at 5-10% humidity is the optimum for long term storage of thoroughly dried seed. If you are sure you are going to grow it out next year, you can get away with sealing the seed in glass jars in a box so there is no light getting at it. Store the box in a south-east corner room of your house, which tends generally to be the most constant in temperature. Even if I know that I am going to sow the seed that I harvested this year next year, I always siphon some off to put in the fridge for long term storage, always. It takes one disaster. We are in flood prone area where I am. It is a rare occurrence, but it would only take one flood to put me back even beyond the beginning point. So always put some away for long term storage. The other beauty of putting it away for long term storage is that you have some genetic material there to call on again to reintroduce desirable traits back into your plants should for some reason they start to wane. Should you become too selective in what you are going to keep, you need to keep some of that original material to be available.

To treat possible insect damage, particularly on peas and beans, weevils actually lay their eggs under the seed coat of the seed. I have known of plenty of cases where people have put their jar of seed away at the end of summer and they have come to get it the following spring and it is full of weevils and they have feasted over that period on the seed. Freezing in an airtight glass jar (screw top jars are the most airtight, the seals on the top of the coffee jars are not reliable and will let moisture in) for 48 hours will kill most species of weevils and their eggs. Put the jar in the freezer, pull it out after 48 hours but don't open it until it is back to room temperature. Opening that jar straight away to have a look or a fossick around or get some seed out for somebody will allow condensation inside the jar and then moisture into the seed. This goes for seed kept in the fridge as well.

E. CONCLUSION

We have touched on the new laws that require growers to use certified organic seed. I have heard several interesting thoughts and I just want to throw a couple up as food for thought for the people here.

I have heard that it is an outright attempt to destroy the organic industry. That one doesn't gel with my philosophy because we can make too much money for the bureaucrats to just destroy us.

It does open up a very distinct possibility for multinational seed companies to get in on that organic market. Selling organic hybrid seed that is certified by who knows, at a premium price – a daunting thought[23].

Maybe it is the bite on the backside that we need and the warning that we need to actually compel us to do what we probably should do already. I personally have no problem with the requirement. I think that ultimately it is a good idea to head in that direction – for food crop plants at least - but the time frame placed on this is ludicrous. We need a lot of years to be able to achieve the aims that bureaucracy has placed on us.

I am open for members of the Association to ring me at home, because in a situation like this you can't cover all the practical requirements that each species or variety requires. I am happy for people to contact me and talk about individual varieties.

F. QUESTIONS AND ANSWERS

Q. When taping up the pumpkin flowers, do you have four males from the same plant or is it important that they weren't?

I should clarify that.

To maintain the traits that I like in a particular variety that I grow, I need to take the pollen from as wide a sample as possible within that variety. If I was to take the male flower and pollinate the female flower from the same plant and do that time and time again, it is a slow form of hybridisation and in-breeding. So yes, you want your pollen to come from a wide source within that particular variety.

Q. When you talk about cross-pollination: We grew some Jap pumpkin last year mainly and had some butternuts on the other side, and had some orange Jap's. Have you ever heard of that?

Jap pumpkin is a variety that no one has been able to box. They are unsure whether it is a *moschata*, which is the same as a butternut, or a *maxima*. Originally the Jap's were placed in with the Queensland Blue but probably over the last five years the train of thought has been that the Jap is actually a *moschata* variety. Japs don't grow down my neck of the wood so I have never really studied a Jap pumpkin trying to decipher it for myself. There are small differences in the stem of the pumpkin and some of the characteristics of the seed between the three different pumpkin varieties. I probably only concentrate on what I can grow. Observation, as Alex has mentioned many

[23] South Pacific Seeds can get certified organic hybrid vegetable seed from overseas. The rep told me that on average it is 2.5 times as dear as conventional hybrid seed and 1kg is usually the minimum order. Based on a price list from a large hybrid seed supplier here is what you may have to pay for the organic hybrid seed. Broccoli $4,500-$6,000/kg, capsicum $12,000-$20,000/kg, cucumber $1,000-$4,000/kg (Continental and Lebanese are dearer), cauliflower $15,000/kg and tomatoes $15,000-$74,000.

times, is the key. If you have observed unusual Jap pumpkins then they have been cross-pollinated.

Q. Does cross-pollination affect the crop?

The cross-pollination won't affect the crop that is in the ground at the time. If you have Queensland Blue in the ground and your neighbour has Triamble pumpkins they will cross pollinate, but the fruit that is produced will still be Queensland Blue. It is the seed that has been tainted and crossed. Seed from those ensuing generations will produce a mixed bag, from Queensland Blue to Triamble and anything and everything in between.

Q. What is a good distance for isolation?

That's a vexed question. It can be a seasonal thing. It differs, depending on the species – from a meter to kilometres. I haven't got all that information in my head. There is plenty of literature that will give you recommended distances for any food crop that you can dream of. Some literature comes from the Seed Savers Network in Byron Bay[24]. They do have some very good literature on isolation distances.

Q.: I have a bit of a concern with the idea of the open pollinated seed and the consumer. The consumer has a demand for seedless watermelon or super sweet corn. Where are we with that concerning certified organic seed?

That's a problem. All I would argue is that we have to somehow change it. It's a hard task. I tried to sell round zucchinis. It took three years for the retailer to convince people that these were good. For me it stems back to the fact that even if the consumer is a bit apprehensive it is my independence that is at stake. We can't just be concerned with our dollar and us and that the consumer is going to shun some of our produce. We have to think about future generations. That is another reason why I save seed. I would say that you will be able to buy certified organic hybrid seed. I think if you feel the necessity to keep growing them then that market will be fulfilled. But in doing that you have to realise that you are ultimately at the mercy of the seed producer and your choice will decline to the stage where they will determine in any given year what you are going to grow. For me, no choice means I am disempowered.

Q: What are the possibilities of bucking the system and getting that rule changed - using hybrid seeds to grow organic crops? Is it such a big thing that it is a health risk? Wouldn't it be a lot easier to change that rule, that you have to have organic seed for things such as the hybrids? Is it difficult to get? Surely the consumers are the ones that drive the market and unless the shops supply what the consumer wants it is very difficult to bring them around to take what we grow. We should be looking to do our best to supply the consumer's needs.

I agree with supplying the consumer but I also feel that most people who buy our produce do it as either a conscious health or environmental decision, or I hope they do. This is my personal opinion. I feel that rather than going without their **Demeter** bio-dynamic watermelon, due to having seeds, and going back to the conventional

[24] Seed Savers Network Address: PO Box 975, Byron Bay NSW 2481
Book: "The Seed Savers Handbook" by Michael and Jude Fanton

seedless variety, that people would stick to the food they have been used to. Food of a superior quality.

Alex: Denmark was put up to Europe and worldwide as the example of a country going organic. I have been through Denmark several times and other than a small strip on the West Coast where the dairying takes place, there is not one animal to be seen. They have huge farm buildings where animals used to be, but now all land is cropped. So it is an organic faming on the basis of pelleted chicken manure or whatever else – it is not closed organic farming. I am told that in Denmark three years ago, 42% of the population chose to buy organic, last year it was 11% because they said, "Why should we pay this money when the produce is no different from the conventional?" As a bio-dynamic farmer - with organic farmers I don't know - you would have the task to actually educate the consumer as much as becoming educated yourself. That is to make sure that you have the highest quality bio-dynamic produce and by the quality the consumer is guided to buy. If we go the other way we will lose varieties, we will lose everything that is explained to us just now, in a most excellent way.

Most of my produce goes straight to a retailer. He was worried about the size of my broccoli heads being smaller, not that big almost cauliflower size hybrid variety, but real broccoli. After a short time he told me that any fears he'd had about the product not selling have totally been washed away. The side shoots sell as well as the heads. The customer wants quality.

The other beauty I will just touch on for my type of operation for using non- hybrid seed is that I haven't got 1200 broccoli ready in two weeks that I have to pick and get away. I have 1200 broccoli ready in over six weeks. That suits my situation and my style of marketing. It ultimately boils down to each individual. You will be given the choice I am sure and you have to make and live with your own decision, regarding what you do with hybrids versus open pollinated seed.

Q. Does the retailer you sell it to suggest advertising the open pollinating variety? Does it actually become an issue with the consumer?
Will it be left to people like you or are huge resources poured into plant breeding by governments on behalf of the community?

No the actual retailer doesn't make any differentiation between the open pollinated variety of vegetables versus the hybrid ones. You raise a very valid point. I think it will become an issue for the consumer[25]. Open pollinated seed is probably going to get to the stage where it is invaluable, if things keep going the way they are you won't be able to put a price on the value of open pollinated seed. For me, the multinationals are the government. The government is there to run the forum, run the senate investigations to appease the masses to look like they are actually questioning these things.

Q. Does the seed need to move around to different geographical locations?

[25] One of our very good market gardener colleague's in Germany has recognised the need to educate the consumer. She has written an information sheet to explain the varieties (all open pollinated), the reason why she seed saves, and despite the time required to do so, the resulting quality product which her retailer sells as "premium product".

Basically no. It doesn't need to move from Inverleigh in Victoria to Bega in NSW or wherever. It will perform differently but as far as maintaining the vigour of the seed in that variety, my experience is that it doesn't need to move geographically around the countryside.

Alex: Jeremy (the questioner) is near Canberra. It is a much more one-sided climate for vegetable growing; hot and cold to you (Darren) or to Bega. So there is a certain justification in that case that I would consider between being high up and very cold and then very hot and very little rainfall, not this year but of any year, and sort of bleak, windy compared to where you are. Jeremy grows good vegetables in conditions that a commercial market gardener wouldn't even consider. So there is a justification and a possibility whereas if you are in your area certainly not.

Trevor: We have potatoes and have grown our own seed year after year and it has always been that you should take those potatoes to a different soil type and possibly a different climate to some degree to keep them healthy and we found that not to be the case, but we have a fairly healthy environment where we are.

Alex: That's a factor of the bio-dynamic development of the soil which brings new life to plants and very much so on your farm which was a third rated country and it is certainly not today. Darren is on first class alluvial basalt so all that has to be taken in consideration. This problem had never occurred to you before because you are in your district.

There is no doubt that if I send you seed that it will perform differently. It may display different traits that are more desirable for your region. What you must do is breed from the best of what I give you. Certainly plants will react differently in different climates.

Q. It is actually to do with the fact that I found out that D.P.I have varieties of some of the old grains. Every two or three years they have to grow it, they plant it out in crops and then harvest it. They just do their own thing, by law they have to. But the interesting thing is they throw excess away. Someone I know from DPI gave me all the excess stuff that they had. I have since found out that there are also other government departments that may have seed banks.

Yes, different states (DSE it is now in Victoria) have got seed banks deposited around the countryside. If you can actually get to speak to anyone that knows what he or she is talking about you may find out where some of them are. There is a DSE seed bank at Horsham that contains stocks of dry land pea varieties. So they are certainly around.

Q. Are you interested in growing seed commercially?

Personally no. I hope to be able to help other **Demeter** growers with some seed. But I think it would be invaluable for some of our more isolated farmers if they could manage it to grow crops for seed. Vegetable and especially green manure seed would be invaluable, not just to the **Demeter** growers, but to the whole market in general. If you want to look at it from more of a perspective as a viable commercial option you should have no trouble whatsoever of selling non-hybrid stocks of seed. It would obviously be wise to have a market first though.

Q. How many varieties can one person handle?

Back six or seven years ago I was growing out varieties, hand pollinating them and saving them for an organisation I was involved with. One year there was potatoes included, which are pretty simple, I grew 130 different varieties. The stock just needed to be rejuvenated. It had been in long term storage in freezers for several years. There were limited members and limited resources and basically we had to do it. There were 20 tomatoes, 25 beans, 5 zucchinis and pumpkins, 24 potatoes, cucumbers etc. At the moment I have 45 different vegetables that I grow and maintain for seed stocks.