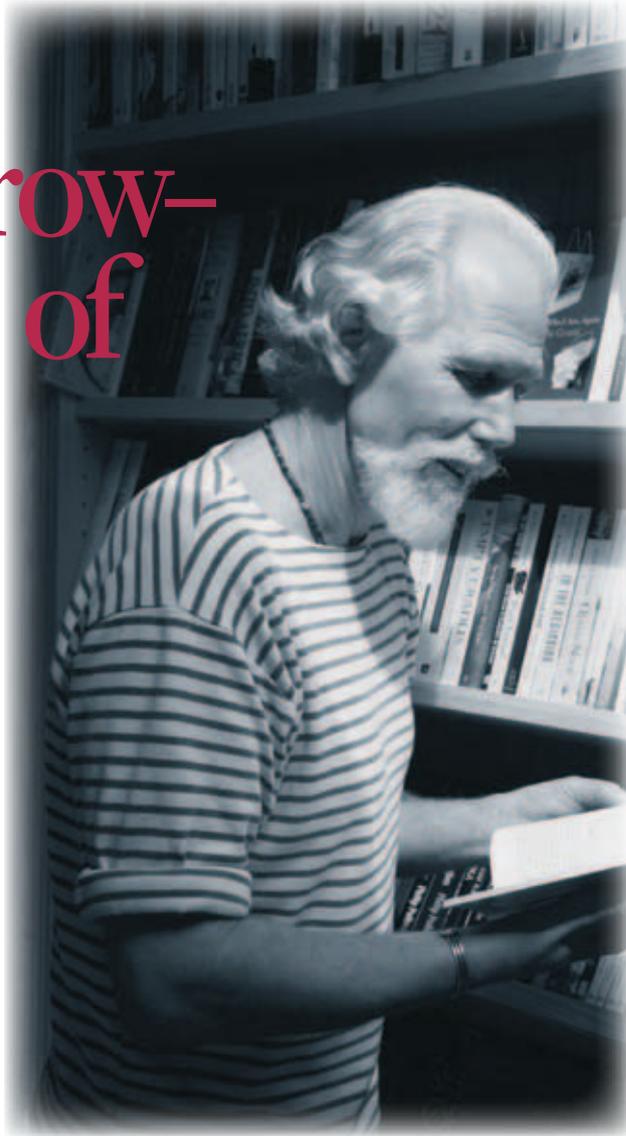


Seeds of sorrow— Seeds of Hope



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Tyll van der Voort is the Land Manager at Clairvaux Trust near Darlington. Formerly he managed the horticulture at Oaklands Park in Gloucestershire where he also devoted part of the land to growing seeds for Stormy Hall. On the third day of the conference he gave a lecture in the morning. What follows is a report based on the transcription.

Tyll started by quoting the French philosopher Jacques Ellul, *“In technological society all forms of human activity, whether personal behaviour or organised social and economic activity, are fundamentally adaptive to the dominant logic and the form of the machine.”*

He then went on to outline several metaphors that inform the way people live today. These are the machine, combustion, linearity, exploitation and debt. These new metaphors are of a different nature to the old ones, which were of a cyclical or rhythmical nature. From those old ones came such words as ‘whole’, ‘heart’ and ‘healing’. The word ‘cultivation’ comes from the Latin word ‘cyclical’, as does the word ‘cultus’.

One of the consequences is the way these modern metaphors influence our attitude and thinking, for example reductionism and determinism. With modern reductionist geneticism the organism is thus seen as a genetic machine consisting of different parts.

However, the epigenetic view shows that there are larger organisms which influence the genes. There is a

By Tyll van der Voort

**Report of lecture given
at the Conference**

**Edited by Richard Swann
unrevised by speaker**

dynamics of emergent processes and a relational order between the components of the different parts and this order between the components matters more than material composition in the living processes.

In genetics therefore it is generally seen that it is the genes that express themselves. You then have the DNA in the genes as well as the messenger RNA, which informs the proteins which in turn builds up the organism.

However, we know that this is not so, but that it is really the organism, the cells, the tissues and all the different structures that are nested within each other, that inform the genetic pool, so that there is a ‘conversation’ between the organism and the genes.

So it is really to do with relationships, and if you look at that then also in the higher orders, in the transorganismic realm, you have the field where relationships, creativity and values all come in.

Biology, for us, and also in the field where these modern epigenetic investigations are being undertaken, takes on much more a science of qualities rather than quantities. So one could say that we realise that matter flows through the organisms. They maintain their form, certain patterns, and their organisation in space. However, in today’s biology of genetic determination, the view is that the emergent order informs the very building stones that we are talking about.

If one takes the view that organisms are as real and as fundamental as the molecules they are made up from, then one cannot just take them apart and describe the organism as a composition of its individual parts. One can then ▶

ask what are we talking about when we use the word organism.

The organisms as the basic elements of biological reality are disappearing fast. This is leading to a kind of atomism and fragmentation that, in turn, lives in people's hearts and leads to what one could call a general ontological insecurity. With that is meant an insecurity as to who we are, why we are here, what we are doing and where we are going. This is far worse than economic insecurity.

Along with that goes a breakdown of immune systems not only of organs but also of the spiritual, cultural and social immune systems that we, as people, have developed. So these are very strong consequences that come of the way we look at life.

It is interesting to see that from the whole of Darwinian research and the knowledge that we are gaining from it that this is continuously increasing. Today there is still an absence of any theory of the organism as a whole, as a distinctive entity. In a way it is quite a paradox that the more we know the less we know about the forms of organisms. We know a lot about substance but we know very little about how form comes about.

Why for example, is a chamomile a chamomile? Scientists try to tell us about its active ingredients, if you can make those for example out of oil, then we do not need any 'fancy packaging' (flower, leaves etc). What is meant by form is that the chamomile actually looks like a chamomile. However the fact that chamomile also expresses itself as chamomile, with all its aesthetic, sensual and tactile qualities is often disregarded.

OUR RELATIONSHIP WITH THE PLANT WORLD

According to modern science there has been life on earth for around two to three million years. Within that period agriculture has been in existence for about 12,000 years. However for most of that time we have been hunter gatherers, and only 6% of all humans who ever lived on Earth have lived by agriculture. 90% of the estimated 80 billion people who ever lived on Earth spent their life as hunter gatherers.

Then we had a very different interchange with the plant world and so industrial agriculture is just a blip in a very long involvement with plants that we, as humans, have.

It is estimated that there are around 375,000 known species of plants, of which around 20,000 are used by man as food, medicine, technical uses etc. Of those, 500 are used as cultivated plants, excluding woodlands / ornamental plants, and 160 of these are used in larger amounts somewhere in the world.

Thirty species constitute 95% of human food of which twelve make up 90% of all the plants that are grown for humans. These are wheat, rice, maize, rye, barley, oats, potatoes, rape, soya beans, cotton, tea and coffee.

North American Indians (hunter gatherers) used for example 1,000 plants in their foraging in nature. Now you can see with this they had a very different engagement with nature.

BIOTECH COMPANIES

The twelve species mentioned above are the main target of the large agrochemical companies. We have entrusted the stewardship of our food supplies to such companies who, for example, supplied Cyklon B to the Nazis for their extermination camps.

In the last decade three companies have together taken control of 50% of the world's commercial seed market. And in 2005 Monsanto who only started with seeds about ten to fifteen years ago was the largest conventional seed merchant. Very cleverly many of these companies have rebranded themselves as life sciences, which means they are 'occupying our territory'.

Tyll then went on to quote from an issue of the New Internationalist published in 2010, which lists the top ten agrochemical corporations such as Bayer, Syngenta and Monsanto. The ten largest seed companies were also listed and there is a huge overlap, meaning that these companies have control of the whole of the agricultural process.

The top three seed companies alone control half of all patented seeds which account for 82% of the world's commercial seed market, and Monsanto's seed occupy 87% of the total area devoted to genetically engineered seed worldwide. Monsanto is a relative newcomer since in 1996 they were not even listed amongst the top seed companies.

The main consequence of all of this is that there is a huge concentration of power. These companies have taken the seeds out of our hands into the laboratory.

On the positive side three-quarters of the world's farmers still grow locally bred seed varieties and sow their own seeds. And 85% of global food production is consumed close to where it is grown.

SEED BREEDING PROCESSES

The classical methods of seed breeding involve mass selection, positive and negative selections as well as crossbreeding.

In the 1920s F1 hybrids were developed. This is where two genetic lines are crossed to achieve specific characteristics from each line such as big and red (for a flower). When successful you get what is known as heterosis, which is that the desired characteristics are strongly expressed. However at the same time this results in a depression of the seed lines. If you then try to breed with these seeds you get an explosion into all possibilities of the characteristics of the original genetic lines (e.g. large red, small red and other colours and sizes).

This constrains the farmer into not being able to save his own seed. He then has to go back to the seed company and is at their mercy!

Science has moved on since this was first developed to more sophisticated and intrusive methods. Further developments include:

1. Induced mutagenesis – through bombarding plants with say radiation or poisons.
2. Cell fusion technique or protoplast fusion – here the two cells from unrelated plants are stripped of their membranes and fused together. Through this method new species can be made from plants that would not normally cross.

3. With cystogenesis genes are introduced from plants of the same species

4. Transgenesis is where the species barriers are crossed, e.g. using fish genes in tomatoes

The problem with these more sophisticated methods is that they cannot be carried out on the farm, but only in the laboratory. One result of this is the patenting of the new seeds crosses. This brings up ethical issues as a result of the violation of the genetic integrity of the plant through these intrusive methods.

Tyll spoke of his concern that these methods despite being scientific are also very imprecise and are at times very brutal in their execution. They are carried out by people who 'know nothing about growing life'. He thus likened the geneticist to the true 'blind watchmaker'.

CONSEQUENCES OF THIS

The threats and the consequences of all of this are starkly staring us in the face. Amongst these are the erosion of biodiversity, monocultures and industrial production strategies. These then put the diversities of culture under threat in agriculture. So we have a loss of biodiversity and huge genetic erosion.

As an example out of the F1 hybrid field. In the olden days if you had a field of corn in say Yorkshire it would have probably had a genetic diversity of about 90,000 different strains with slight genetic differences. This year Tyll said he had seen densely populated grain fields with ears that were big, fat and heavy and standing on very short stems. When the combine harvester went over it, there was no straw left. The plant was entirely 'pulled into the earth' - 'a heavy terrestrial F1 hybrid'.

Now these modern hybrids have a genetic diversity, not of 90,000, but of nine to ninety different strains. So if you get something like the kind of rust that affects a lot of grains you do not lose 1/90,000th of the crop but you lose 1/9th. That is a lot of grain when growing on an extensive scale.

This genetic erosion is moving fast as is the reduction of genetic diversity and with it comes a huge loss of open pollinated strains and plants and varieties.

Along with all of this is the danger of biological pollution, which is a whole new concept of pollution. This is not the same as the pollution that arises from say throwing out plastic bags, but is a kind of epidemiology.

As a result of the increased use of pesticides we are also getting increased residues as well as super weeds. There have been reports of genetic crossing over into other cabbage plants by canola or oilseed rape.

Several human health risks then can arise from transgenic modification:

1. Toxicity - With genetic engineering a genetic cassette is created which introduces a vector into the plant. They are a little like a Trojan Horse which you bring into another cell. They contain promoters, terminators, enhancers, antibiotic marker systems and vectors. By making the plant take up a gene it did not choose then a dangerous cocktail is introduced. It is then not easy to know what these enhancers and marker systems do to the new organism.

2. Immunosuppression. A report came out a few years ago about some rats that were encouraged to eat BT (*Bacillus thuringiensis*) treated potatoes. As a result their metabolic and immune systems crashed.

3. Allergic reactions may also arise as a result of genetic engineering. With each cassette that is engineered into the food new and novel proteins are produced that have not been in there before.

4. Antibiotic resistance as a result of antibiotic resistant marker genes being introduced.

5. Loss of nutrition A lot of the GM food has been found to be nutrient deplete.

One of the biggest hazards is however the corporate takeover and the privatisation of seed that goes hand in hand with the patenting and the laboratory processes. We are entirely disempowered and separated from the seeds. This started with the hybridisation and the seed patents. It only began in the 1990s when the World Trade Organisation started to have intellectual property rights extended to life forms.

With the violation of the organism comes ethical dilemmas. Scientists are seeing the whole of nature whether a mouse or tomato, as a quarry to mine and take out whatever it wants. With this the wisdom of species boundaries that have taken eons to build is undermined

THE SEED IN THE AGRICULTURE COURSE

Rudolf Steiner speaks about the seed in the 2nd lecture of the Agriculture Course. There he describes how in the seed the plant goes into a phase where it becomes more chaotic. It disengages itself from the physical world and goes into a more etheric space and becomes more 'open'. There it reconnects with the archetype or morphogenetic field.

The pollen, for example, has a period of seven minutes where the whole genome falls apart. Even for scientists with their microscopes cannot understand this.

As in chaos theory order is also present. This order is called the strange attractor where new order can emerge. According to David Bohm (author of Wholeness and the Implicit Order), the oak tree is not in the acorn, but the acorn is an aperture to the implicit world from our world - the explicit world.

Elsewhere Steiner also speaks about the true fertilisation of the seed. He describes it as the moment when the seed hits the soil. Then the plant opens itself up to the sun and fructification takes place between the seed and the earth.

The plant in a way sucks the sun's energy down into the earth. And from there on all the other creatures start to live.

This newer way of thinking then has consequences for the way we view plants. Once we realise that they are embedded in the cosmos, we then start to respect species boundaries and can start a personal relationship with the organism. ▶

Network for biological and biodynamic seeds and biodynamic plant cultivation

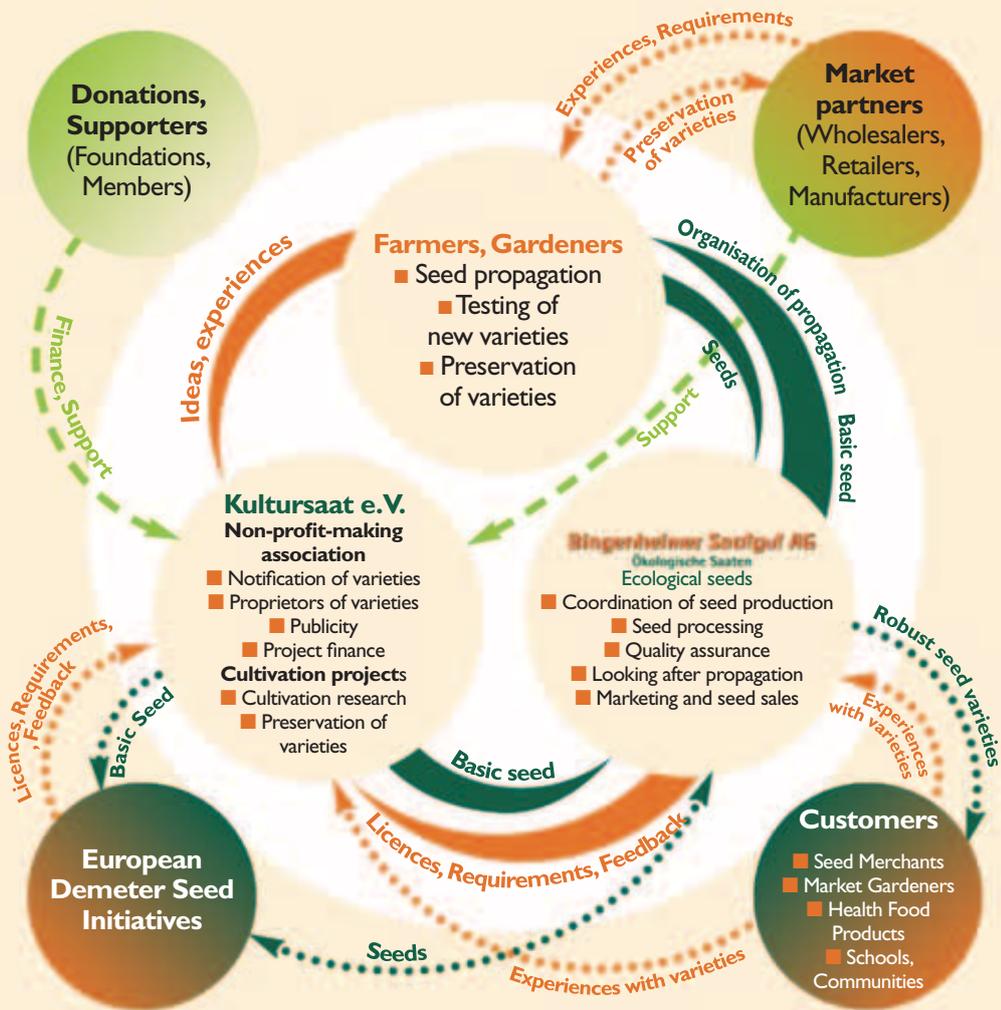


Diagram showing the network that has been developed to support the plant breeding work in Germany.

By doing so we discover that plants are incredibly elastic. Thus instead of ‘bullying’ the plants with genetic modification we can approach them with respect and see how far we can take them. They are then quite willing, as has been shown in the way mankind has worked with plants for about 15,000 years.

We then create the conditions for the plant to express its full potential and its full possibility. This means you respect the intrinsic value of the plant. It stays in its own domain or kingdom unviolated.

To do this we need to develop new inner qualities and not external technologies, to see where we can go with the plant. We also soon discover that for example a wild plant is very cosmic and expresses its own being.

In the Agriculture Course Steiner speaks about plants that are too fat, thick and heavy as being earthy and anything that is wild is thin and in a way spiritual. In working with plants we need to find the balance between these cosmic and the earthly aspects. This area of work is in what is known as the soul realm, where we as humans live.



ORGANIC SECTOR

There is some concern that the organic sector has become more mainstream in its attitude. This is quite evident when looking through seed catalogues which have organic seeds. Quite often the seeds are grown for one year under organic conditions as a minimum qualification for organic status. The seed breeding that went on before that last step may be detrimental to what is trying to be achieved with organic status.

Very few specific organic breeding efforts are being undertaken within the organic sector, so the question arises as to what qualities are asked of the plant when growing organically?

We know that most of the seed is in the hands of the big companies but in the organic sector, there is great worry but little is specifically being done to alleviate the problem.

This is not to discourage the organic movement. There are many people who are kind of in various different organisations, from IFOAM (International Federation of Organic Movements) on down, who are involved in seed saving and seed exchanges. But in terms of breeding, ownership and all that, most of the interesting efforts are in the developing world.

However the organic breeding goals are in many ways quite similar to the ones for conventional plants. These are disease resistance, yield, nutrient deficiency, tolerance to abiotic stresses with quality coming last of all.

However, the qualitative aspects which makes food fit for human consumption are still under-researched. ▶



*Vegetable and flowers being grown for seed and breeding at Bingenheim, Germany
© Richard Swann*



NEW PARADIGM FOR SEEDS

Tyll went on to quote from Manifesto on the Future of Seeds by Vandana Shiva, where she gives a new paradigm for seeds

'The failures, limitations and vulnerability of industrial agriculture and corporate monopolies must be taken into account in a post-industrial concept of seed and food production, a concept that should be based upon holistic, long-term considerations – considerations that present-day industrial agricultural systems, that produce for a global market, by their very nature are unable to take into account.'

'Seed diversity can be saved only if the livelihoods of small farmers who save and use bio-diversity are protected. Biodiversity based farming systems generate more employment, produce more nutrition and better quality food and provide higher incomes to farming families and communities. The challenge of agriculture must no longer be to produce huge quantities of nutritionally unbalanced food, but rather to produce nutritionally balanced food in a sustainable way. A sustainable agriculture maintains the natural resources needed, preserves the communities and social and cultural systems that allow for the appropriate distribution of food, and provides the possibility of decent livelihoods in rural areas.'

'The one dimensional focus on 'yield' has led to a serious decline in systems productivity, food quality and nutrition. Quantity must give way to quality. Seed production by Food Communities is based on a holistic concept of food quality that considers taste, compatibilities with human physiological and cultural conditions, all aspects of nutritional properties, the degree of biodiversity present, the environmental impact of production, as well as the working conditions, processes of participation and value of retribution to producers. This holistic concept should be the first step towards reinforcing or creating and dispersing seeds for quality food systems.'

'Diversity, freedom and the enfolding potential and evolution of agriculture and humanity are core principles of the law of seed.'

GERMAN SEED ORGANISATION

The biodynamic movement in Germany has taken this up and is now working in quite new ways. This has resulted in the bringing about of two institutions: Bingenheim and Kultursaat.

The challenge of seed erosion was one of the reasons why Steiner was approached and asked to give the Agricultural Course in 1924. People went to him and asked why food, seed quality and animal fertility was declining.

Later, in the 1950s, the first plant breeding work started in Germany. Notable here was the work of Martin Schmidt who started breeding grains. Hugo Erbe also took up plant breeding as did other renowned vegetable breeders.

The question then came up amongst biodynamic growers: "Where do we get seed from that is good for biodynamic growing? And how can we multiply that seed so that it is actually available?"

Subsequently in 1985, a number of biodynamic vegetable producers who were involved in the multiplication and breeding of open-pollinated varieties set up the "Initiativkreises für Gemüsesaatgut aus biologisch-dynamischem

Anbau" or Initiative Circle for Vegetable Seeds from Biodynamic Farming. This was initially an informal platform for the exchange of ideas, experience and seeds.

That led to the establishment of the non-profit association Kultursaat (cultural seed) in 1994. Then they had a membership that was open to all who wanted to pay the membership fee. Today they have 280 members of which 19 are breeders. Their executive board consists of a delegation of some of the members. The association also employs three people to run the administration.

The breeders themselves are also financed from the Kultursaat. The association's income is from grants and foundations as well as license fees when registering new varieties. There are strict guidelines as to how they can go about that and so there are ongoing discussions between the different parties. Part of that involves seeking out old open-pollinated varieties that look promising. They can then finally be registered as an official registered variety.

They also undertake coaching and mentoring and so on. They as a group also evaluate new breeding methods. Their aims are:

- To supply Demeter growers with Demeter seed
- The maintenance of open-pollinated varieties
- The breeding of new varieties
- Research and development into novel breeding aims, like taste, colour and so on.
- And also breeding research into novel approaches to working on the introduction of new species, for example, as food plants.

In 1989 they realised that they needed a seed company, where people could actually buy such seeds. So they started a small seed company called Allerleirauh GmbH, which later on in 2001, developed into the Bingenheimer saatgut AG which is now a big enterprise celebrating its 10th anniversary

This is a firm with shareholders with what are called vinculated shares. This means that not only can you buy the shares, but the people who have the shares as well as the managers have a say in who can buy them. It was set up this way to avoid being taken over by someone whose aims are not in line with those of biodynamics. .

Bingenheim is now a proper seed company with a large extensive catalogue and they send seed all over Europe. They have had 20% turnover growth in the past two years. It has been successful because people appreciate the good seed they supply and that they are very professional and trustworthy.

It is now a relatively large enterprise that is contracting 100 growers, some of whom are members who can hold shares in the company. This firm is owned by those people to a large extent.

They have developed different structures for their spiritual, economic and social activities. This has been done really well so that one can say all of these are individual organisations which communicate with each other. As a consequence everybody is involved at some stage in the process from the spiritual impulse of breeding and researching, right down to actually obtaining the seed.

As Bingenheimer Saatgut grows, one of the big challenges for them is to find enough growers. They need larger areas, more people and more professionalisation.

They realise that there is great pressure through climate change on certain varieties, such that they now have to grow certain plants, like cauliflowers, in Italy.

Kultursaat make sure that they have new varieties, and now have around 40 – 50. Acceptance of these new varieties involved a very difficult legal. They have created and bred new biodynamic varieties out of old open-pollinated varieties that are now available and registered.

They get a license fee paid by Bingenheim where the varieties are multiplied and grown. The growers are paid by Bingenheim for multiplying. So there is an economic relationship. There is a spiritual relationship and there is a social relationship, because they come together and they own each other's shares. It addresses all the problems that we have talked about before of getting seed sovereignty back into our hands, back to the growers and getting a conversation going between all the people that are involved. .

There are other contributors and initiatives, for example Sativa and Reinsaat in Switzerland. There is also the initiative Avenirsem (Sowing the Future) started by Ueli Hurter and Peter Kunz, where people come together to sow a large field of corn together in order to demonstrate that we want to have GMO-free fields. It has been done here in Britain at, for example, Hungary Lane Farm. A hundred fields in 10 different countries this year were planted by large groups of people who together sowed a field of non-genetically modified, biodynamic grain.

A similar structure to that in Germany needs to be considered for us in the UK. At the moment we have Stormy Hall with the unceasing and wonderful efforts of Hans Steenbergen. However that is a bit under threat at the moment due to the demands of increasing administration and paperwork.

NEW PLANT BREEDING APPROACHES

Within biodynamic plant breeding there are two things that are important.

1. To maintain and multiply the seeds
2. Quality

There are many ways to view quality. The supermarkets see it from an appearance and shelf life viewpoint, are bred for that purpose and are not really fit for human consumption. Other considerations are such things as resilience to climate change with local adaptability and sustainability. Plants need to be true-to-type and at the same time plastic and flexible.

In France they speak of *le terroir* especially in relation to wines. It specifically addresses the farm organism or locality and is very important in France. As biodynamic growers Tyll reckons we are *terroir*-ists.

In human nutrition it is the life substances that nourish the body, soul and mind. They help us to commune with the world around us as well as the wider cosmos. With industrial food, we thus get industrial thinking. This is written about in the introduction to the Agriculture Course.

The new breeding methods are based on Goetheanism and anthroposophy. They use quite different paradigms for going into working with the plant for breeding purposes.

A lot of the breeders who work with this new type of research and breeding are very highly qualified people.

Just as scientists might need seven or ten years to educate themselves to be able to do genetic modification, so it will be with the people who are working with this new approach. They need to be equipped in quite different ways to be able to carry out etheric formative forces research. Sometimes that may involve up to 10 years of meditative, introspective work.

They approach the plant in quite a different way by asking the plant who it is? They also create breeders' meditation circles and may expose seeds to for example eurythmy, sounds, particular planetary constellations or biodynamic preparations. All this is being done by a group of people who have created inside themselves a space of reverence and awe for the plants and who are very familiar with their subject.

Tyll spoke about a farmer in Germany some decades ago who used to put his hands into the seed before sowing. He said he wanted to connect the seed to the stream of love that only comes through people. Some farmers would take some of their seed and carry it around in their pocket before sowing.

Through bringing new qualitative breeding approaches together with the need to maintain and multiply in a very respectful way, means starting on a path of discovery. Around twenty people are working this way on a semi-professional basis in Germany, with some even working on a professional scale.

A new range of quality testing methods have also arisen such as capillary Dynamolysis (rising picture method), copper crystallisation and the work of Dorian Schmidt.

The biodynamic movement is the only movement where this sort of work is being carried out. To find anything similar would mean going to Africa and India where out of an old consciousness there are rites with rituals around seeds.

CONCLUDING IMAGES

Tyll concluded by relating about a time in Oaklands when they were trying to be a bit more aware of the processes of sowing. One morning whilst they were sowing carrots, one of his apprentices told him that she sat with the seeds all night. She sat with the seed, because they were going to sow.

However it requires, as Steiner says, that the laboratory, is our new temple. It will only be people who are ethically and morally equipped to enter into that temple who will succeed. It will not be for those who go into sub-nature, or there without proper moral development.

To conclude we should take to heart what Vandana Shiva writes in the booklet Manifesto on the Future of Seeds: "Seeds are an expression of Hope" ■