Modern wheat or ancient wheat?

We mentioned, in the pages of *Valériane* n°125, the holding, at the end of June at the Ferme du Hayon, of the European forum *Cultivons la Diversité.* Following this event organized by the *Meuse-Rhin-Moselle Network* for the defense and promotion of peasant and citizen seeds, it seemed useful to us to give an extension to the question of cereal seeds, within the framework of this dossier.

We will begin with Marc Van Overschelde, who had told us, not without lucidity, in the same issue of *Valériane* n°125, twenty years of life at the Hayon farm. We will continue with Marc Dewalque who talks about the drift of seeds in the agro-industry and the solution of peasant selection.
We will end with an evocation, in the company of Axel Colin, of the birth of the *Li Mestère* network which aims to safeguard, rehabilitate and promote the cereal biodiversity of our Walloon regions.

“My passion for the renewal of wheat”

COMMENTS COLLECTED BY JÜRG SCHUPPISSER

“In 2009, despite more than twenty years of agricultural practice, I realized that I still knew nothing about wheat, confesses Marc Van Overschelde.

Since then, with the old wheats, I look, I observe and I see laughing wheats - gold color for many, red, green for others, or even bluish green. They are the ones who really like us! They put a part of meaning in my life, arouse in me a healthy curiosity and bring a first answer to the question of knowing if it is really necessary to produce to produce...

Each of us must find the appropriate agricultural practices and the seeds that are able to flourish on our land. We must therefore continue the research that our ancestors have been doing for ten thousand years and start all over again from the seeds that are ours. The big seed companies, themselves swallowed up by the agro-industry, have monopolized our own seeds to resell them to us at prices not proportionate to the value of the harvest, at double or even triple. They imposed the chemical straitjacket on us to achieve record yields...

But, ultimately, their seeds do not adapt to us, they no longer suit our terroirs.

And, above all, the taste and nutritional qualities that we loved have not returned to us!

Extensive research is therefore to be re-undertaken and this is what excites me today: finding wheat which, without this chemical straitjacket and only with what we can offer them - that is to say the care of the soil and good manure - give us enough to make nourishing and healthy bread again. I am even starting to meet organic farmers using hybridized seeds who ask questions and come to see what we are doing.”

The freedom to experiment “Obviously, what frees my mind and allows me to go further in autonomy and reflection is the happiness of no longer having a loan to repay. The day-to-day farmer who is bothered by the need for productivity linked to indebtedness probably does not have the heart to question himself.

Today my farm is running; it even allows me to take a fully civic-minded approach: clearly saying “no” to the four multinationals that hold all the seeds of humanity. We, farmers, above all need autonomy; this autonomy allows me to add a political approach to my civic approach: working for the reappropriation of the seed by those who sow it. Of course, when making roots - potatoes or beets it is more difficult, at first glance. Our advantage with cereals is that the grain is both the fruit and the seed. And then there is the qualitative gain of the “population cereal”, adapted to the soil and the climate. Thanks to its diversity, it will have to be treated less because it will be more resistant to diseases. Each farmer could therefore create his own “population” because it depends on his land and his farming practice: how he sows, more or less densely, when? The big conventional farmers, for their part, produce above all what the market demands, with specifications that are imposed on them. They are not free! This loss of freedom of choice is a real alienation that leads to the loss of autonomy of their farms. At Hayon, we can experiment, starting with choosing the seeds we use. For example, choose the largest grains, those that pro

Other experiments with other cereals must now be encouraged with other farmers! Here, an ear of rye... - Photo: Benoît Roos

come from the healthiest plants and which have been able to take advantage of all the strength of their photosynthesis...

Another very important line of research: the density of seedlings and the appropriate cultural practice. An experiment carried out last year, only with wheat, gave surprising results: with a density scale of one to ten, that is to say with a sowing of fifteen kilos of seed per hectare and another one hundred and fifty kilos of seed per hectare - that is to say the density generally considered normal the weight of grain per ear varied from simple to double in favor of wheat resulting from low density sowing! So these are experiments that should be encouraged among other farmers, with other cereals: barley, rye, oats, spelled from our regions...

But let's stay calm. We do not claim to hold the miracle solution, nor even that we will be able to live

“Population” mixtures

Two mixtures of cereals called “population” - CCP for *Cross Composite Population* -, *pophayon* and *jafhayon,* were sown this year at Hayon. These are deliberately unfixed and unstabilized wheat mixtures, dynamic varieties that evolve as a result. This differentiates them from so-called “modern” wheat varieties, with well-marked characters following strict observation of DUS rules, for distinct, homogeneous and stable.

The two “population” mixtures were sown on one and half a hectare respectively, using an old beet seeder which was adapted to change the sowing density into nine rows over three meters wide, with one seed every twelve to fifteen centimeters. What will be the tillering power of these seeds? Should they be trampled? Or roll them? What about weeding? So many technical questions to settle and which will be, this summer, at the heart of the concerns, at the Ferme du Hayon...

of our wheat because last year's yields - remember the many weeks of rain and the dreadful month of June - turned out to be catastrophic... However, looking and observing allows us to begin to see the differences that we did not see or that we no longer saw. And that is what it is, perpetuating ten thousand years, a hundred centuries of peasant research...

Such research, today, can only be crowned with success if universities put themselves at the service of the experiments carried out by farmers in search of autonomy. And not the reverse ! Thanks to current communication tools, it seems possible to progress much more quickly towards another form of agriculture than that which is still and always imposed by agro-industry.”

The freedom to choose the seed

“A hundred years ago, we were rich with three or four hundred varieties of wheat. All of this has gone to waste under the influence of agribusiness. In Belgium, we have perhaps thirty or forty varieties left sown on one hundred and fifty thousand hectares. In the case of oats, there are two or three left for every five thousand hectares of crops...
And these new varieties are not adapted to our terroirs! Everything has been tested in the silts of Hesbaye, in the good soil, because the choices and the logic of the seed capitalists are dictated solely by profitability and commercial potential. And their customers are mostly farmers from Hesbaye. Here, in Gaume, or even in the Ardennes, there are only small minority customers... Our yields are equivalent to half or even a third of those in Hesbaye, and the market is much less profitable.

They talk about one hundred and twenty quintals per hectare, we are satisfied with sixty or seventy but they make our farmers happy, even in chemistry... Another sector is therefore under construction because cereals are a heritage of humanity and not a toy for ignorant agricultural technocrats. *Li Mestère* has already collected more than two hundred different types of wheat; at Hayon, we have chosen to sow sixty of these varieties in homogeneous mini-plots. All are carefully observed and will be the subject of university studies. You can come and see them, if you want, and even come and harvest them this summer, if you feel like it...

The two hundred different wheats of *Li Mestère* do not come from a “reserve” of seeds like the one of Spitzbergen which we hear about and which are, in fact, only reserves of genes belonging to agro-industrialists. They are not interested in living seeds, only the genetic heritage preoccupies them, with the ambition of preparing the next GMOs which they will then try to patent... Make no mistake about it: the weak link in the new sector non-industrial food that we put in place, these are seeds and cereal farmers.

The research work that we undertake is obviously not remunerated, nor even funded by any public authority, and that is not fair. A tiny part of all that is allocated to research on GMOs would allow us to progress much faster... For nearly a century, the financial means for research have gone to the conventional and are mainly intended for large crops: beets, potatoes, maize, snail... Rye, oats or barley represent only a few hundred hectares and are neglected. We now need a real political will to give the means to the researchers and the associated farmers who are engaged in approaches like ours! Demanding consumers, for their part, can be of great influence, by simple friendly pressure on farmers, by formulating the demand for more tasty varieties such as, for example, chicken or small spelled... As for me, if I can reach, at the end of my career, four to five tons of wheat per hectare, it means that the research we are conducting today will have been fruitful. We can then claim to feed humanity while respecting the earth and plants...”

TAILGATE CLOSURE

Marc Van Overschelde
108, Ferme du Hayon
6769 Sommethonne
tel. : 063/57.90.80
ferme.hayon@collectifs.net

Seed drift in agro-industry and the peasant breeding solution

BY MARC DEWALQUE

Since 2015, the *Li Mestère* network - see below - has set out to safeguard the cereal biodiversity in Wallonia. He draws his inspiration from what is happening in France, in the movements that are part of the *Semences Paysannes Network* - www.semencespaysannes.org. *Li Mestère* wants to find the local varieties from before the advent of the industrialization of agriculture, at best from before the last war. But what are the main reasons that motivate such research?

A radical modification of the plant and its culture

The entry of agriculture into the industrial mode of production has formatted the seeds - and, consequently, the wheat - which must be aligned with the agronomic and technological values of the industry. It is not the craftsman who has a say in establishing the specifications but the large processing and distribution companies. What will be called “good wheat” or quality wheat, from the end of the Second World War, concerns not a nutritional or gustatory value, but a technological quality.

After 1945, the take-off in the average yield per hectare of common wheat was truly impressive: we went from a average of two tons - or twenty quintals - per hectare, at the end of the war, to about seven tons, in 1995! Such progress is generally attributed to mechanization and inputs, for two thirds, and to seed selection, for the last third. However, the intensification of agriculture has caused the increases - four to five times! - doses of the nitrogenous fertilizer - nitrate -, which is not without consequences on the fight against plants which precisely like nitrate - such as foxtail which will require herbicides -, on the content of free amino acids that like aphids - which will require insecticides - and on the presence of mold diseases - which will require fungicides. This will be all the more true as the seedlings become denser and denser, from three hundred and thirty to four hundred feet per square meter for two hundred to two hundred and fifty

formerly, which also leads to a weakening of the straws since the sun's rays reach the ground with more difficulty. These straws, which were between one meter sixty and two meters long, will no longer be able to carry at the end of their stems the quantity of spikelets filled with grain and will, for this reason, be shortened to... sixty centimeters (1)! However, more than half of the nutrients in the grain come from organic matter from the stalk and leaves. And if there are only sixty centimeters of matter left, instead of one meter sixty. It might make a difference... But no research has ever evaluated that.

Industrial criteria responsible for nutritional loss The intensification of agriculture and the increase in the doses of nitrates are the cause of an inexorable increase in the nitrate content of groundwater, the questioning of which, despite being thirty- five years, has still not identified any possible solutions other than the reverse osmosis filter, which is very expensive in resources and in terms of loss of mineral balance. The increasingly fragmented supply of nitrogen fertilizer changes the grain's amino acid content and increases the proportion of insoluble proteins, known as reserves and/or gluten. However, in intensive agriculture, computerization and modelling, through the impact of mechanization in particular, program this type of splitting of input (2).

A significant loss of biodiversity will also take place through the official seed certification system. Each new variety, in order to be approved, must be superior to the control on the market. Disease resistance abilities will be assigned a bonus or a penalty to the rating. This will cause a narrowing of views, rather than an opening favoring diversity, which is now recognized by surveys on the subject (3). With such a selection, we arrive at a nutritional loss compared to old wheat, especially on the genealogical criterion. This loss is well measured for essential amino acids and pro-vitamin A.

In the last half-century of selection, the new varieties of wheat arriving on the market have incorporated references from research into bread-making quality into the selection criteria for wheat seeds. This will go so far as to change the classifications of proteins which will pass from a scale of solubility - water, salt water, alcohol, acid or base - to a scale of molecular sizes and content of sulfur elements. When the nutritional supply of the wheat plant is taken care of by the supply of fertilizer spread on the ground, the capacity of mycorrhizer decreases. As a result, the seeds resulting from this selection system will give poor results for the practice of organic farming which takes care of fertilization by the previous crop in the rotation and needs a developed root system.

This brief overview of agro-industrial excesses suffices to show how necessary a reaction is today.

Peasant selection, dynamic, participatory and coming from the field Peasant selection preserves the culture of ancient local populations by installing mini-plots of conservatory collection, in order to observe, in this field “library”, the behavioral potential of wheat ancient. The desire to cultivate tall stems and unfixed local varieties - “populations” or, in English, *landraces* - will lead to the search for resistance to lodging. Initially, we will observe the local populations by mass selection, then we will go so far as to operate crosses between these varieties. Like the *mestère,* which means meslin in south-Luxembourgish Walloon and etymologically "mixture", the peasant selection method even goes so far as to operate mixtures of populations which, once in place, will operate a natural dynamic of much stronger adaptation to climate and soil than a modern variety that is too dependent on inputs. This work of mixing populations will be monitored, in a network, in participatory terms. In an era of risks due to climate change, demands for low-input agriculture, threats to bio-diversity, this farmer selection method answers all these questions.

NOTES :

(1) Dominique Soltner, *Large plant productions,* Science and agricultural techniques edition, 1987, p.32 and 119. The variety 'Vilmorin 27' measured 1.20 meters in 1927, 'Capelle' one meter in the years 1950-60 , 'Capitole' 0.90 meters in the 1970s and 'Courtot' 0.68 meters in the 1980s.

(2) The seed sector represents $35 to $38 billion just like that of pesticides; that of agricultural machinery weighs $116 billion and that of fertilizers $175 billion. Pat Roy Money, founder of the ETC Group, predicts the takeover of seed and pesticide companies by the agricultural machinery companies that model agricultural production the most.

(3) For example: V. Roussel, J. Koenig, M. Beckert and F. Balfourier, *Molecular diversity in French soft wheat accessions linked to temporal trends and breeding programs,* published in the journal Theoretical *and* Applied Genetics, 111, (2005)

Li Mestère : ancient cereals at the base of a new adapted selection

COMMENTS COLLECTED BY DOMINIQUE PARIZEL

Axel Colin is the baker on duty, the man at the end of the chain, the one who talks to the crowd hungry. We have already come across it in the pages of *Valériane* n° 120, when it was a question of the Odeigne mill. He is at the origin of the creation of *Li Mestère,* in 2015, following numerous meetings with Marc Van Overschelde, Marc Dewalque and Sofia Baltazar. He tells us a bit more...

Unsuitable modern varieties "There is a big void, he says, between conventional and organic, at the level of cereal seeds. Something is missing that really guarantees the autonomy of the peasant.
Marc Van Overschelde - in connection with the *Réseau Semences Paysannes,* in France - observes that modern varieties are not adapted to his needs, his soil, his environment. *Li Mestère* therefore intends to fill this void, quite simply because the agro-industry obviously does not respond to what the small farmer is looking for a variety adapted to his land. It also does not meet the needs of the baker who is looking for interesting nutritional qualities for his bread.

Me, I'm just a baker but I was soon confronted with the same problem: I no longer had the possibility of buying spelled flour in the Ardennes because the prices had exploded. A small farmer then provided me with some at an affordable price. Then, by dint of buying from him and grinding at the Odeigne mill, I became interested in cereals and I given the magnitude of the problem. Noting the excellent result that I obtained with flours that were nevertheless reputed to be reliable and downgraded - that was seven years ago already -, I said to myself that something was really wrong. But when you want to change things, you start with yourself: the "revolution" in cereals will therefore take place little by little and necessarily in partnership with agricultural research. In Belgium, interest in old varieties of cereals is only beginning to appear, whereas in France, for example, collaboration is already strong between certain INRA teams and peasant bakers. It is a real participatory work where the farmer directs the research. The researcher does not impose his views and everything is co-constructed. However, it is necessary to work very locally to meet the specificities of the work of farmers.

In 2015, *Li Mestère* brought together farmers, bakers and millers interested in all this questioning. Ordinary citizens as well. We were about twenty

Three old varieties among the sixty that were sown this year at the Ferme du Hayon: 'Barbu du Mâconnais', 'Nord des Prez' and an Ardennes wheat... - Photos: Benoît Roos

Maintaining the plots, month after month, thanks to a valiant team of volunteers, this is also what makes quality bread! May they all be thanked: Marc, Hugo, Rémy, Isabelle, Christine, Guillaume, Noémi, Fabrice... Photo: Benoît Roos

around the table and we wanted to found our association on that day. But everyone quickly agreed that it was much too early, that we had neither the time nor the means to invest ourselves collectively in such a heavy structure. We therefore took the opportunity to bring together more vital forces, truly active people, and we structured *Li Mestère* on the cereal model, in four groups. The “chaume” group - the stem - makes the link between the three other groups: it is the board of directors, the daily management, the participatory governance that makes the network work. The “ear” part will take care of conservation, collections and experimentation. The “leaf” part will be responsible for information and training. Finally, the “roots” should take care of the documentation. The “chaume” group has already met several times... Our very first objective was to organize workshops to create momentum by meeting the people directly concerned: visits to the fields, bakeries or mills...

Collection, selection, training, information...

“Today, we are mainly aiming for three things, explains Axel Colin:

1 keep our collection up to date, that is to say, replant a large part of it each year - at least a third each year. If a single citizen takes charge of one or two of them each year, see the number of people we need to “maintain” three hundred or three hundred and fifty varieties in all... Via the Peasant Seeds Network, *we* have received a lot of varieties mainly from France but also from various other countries: Spain, Holland, Germany... A Swiss collection has a hundred varieties of spelled from the Province of Luxembourg collected around 1930! Replanting everything every three years will require significant logistics; therefore, this year, we will launch an appeal to citizens. We are counting on *Nature & Progrès* to relay this information, but also on various networks, including a Flemish one, which is very interesting because *Li Mestère* is not exclusively Walloon but is open to interaction.

1 continue our involvement in a participatory selection program! The *Réseau Semences Paysannes* and the Moulon team of INRA - National Institute for Agronomic Research, in France - have been working together for ten years on a participatory breeding program for common wheat. The seeds circulating within the program are made available to the participants but gradually: first the old varieties maintained within the different participating groups, then mixtures or crosses already made by participating farmers. The objective is to find, for each farm, varieties that work, mainly in relation to the nature of the soil and the climate, but also any other criterion deemed relevant by the farmers. INRA and the farmers carry out a series of observations on the varieties - including the yield - and, even if the farmers will continue to make their own choices, an orientation towards this or that type of seed may be offered to them... further studies will then be carried out on certain mixtures or crosses made by farmers. Crossbreeding is very specific work for a farmer who mobilizes him entirely

at very specific times; it requires total attention, great rigor and great precision.
In short, it is difficult to imagine, in fact, without the support of research. Those who take part in this program are bound by a charter. The return of the peasants is obviously essential; and that which will be given by the bakers will also be taken into account... Two Belgian farmers are currently taking part in this programme.

1 be active in training professionals and informing the general public: it seems essential to us to meet farmers, millers and bakers, but also ordinary citizens and researchers. As for training, we will talk about it below, in the paragraph concerning peasant-bakers..."

Experiments in Gaume and near Tournai

"Let's first go back to the experiments which, within the framework of *Li Mestère,* are in progress in Gaume - at the Ferme du Hayon, at Marc Van Overschelde - and near Tournai - at the Ferme du Buis, at Pierre Cossement. Both use mixtures of wheat. Pierre uses a CCP - for *Cross Composite Population* - which is a mixture resulting from ninety-nine crosses between twenty modern varieties selected for their yield and their baking quality. This is very important because this does not mean that we systematically favor old varieties; modern varieties can, in fact, be very useful and very complementary in certain mixtures in order to meet certain specific needs. Our goal is therefore not to produce old wheat because the old would always be intrinsically better. No, our goal is rather to redo the selection, in particular by using old wheat, in order to find cereals

Finding your wheat for your soil and its climate, as ten thousand years ago, also means improving and adapting your tools with the ingenious help of Benoît; here, the six-meter pneumatic beet seeder transformed into a three-meter seeder... - Photo: Benoît Roos

which correspond to our current methods of peasant farming and which then satisfy our millers and our bakers. And, in the end of course, all those who eat their good bread... Modern varieties of cereals do not suit us, as we have said; the criteria imposed by the agro-industry for decades have shown serious limitations! However, we do not want to find the old varieties only to cultivate them and consume them as they are; they just have to allow us to take a different path in order to arrive at the selection adapted to the needs that are ours today.

Moreover, a farmer can only set a fair price if he sells his flour at retail, to ordinary citizens. On the other hand, if he is dealing with the trader, he will have to sell at the price fixed by the world markets. Only the short circuit therefore makes it possible to properly promote an agricultural product, but it imposes its own questions relating to quality because the customers of the short circuit want above all to know what they are eating. In fact, they simply want to eat better, and this observation can be generalized to all of agriculture. As far as we are concerned, the industry - farmers, millers and bakers - just wants to take matters into their own hands and produce bread that is truly worthy of the name."

Farmer or baker?

"In Belgium, continues Axel, you are either a farmer or a baker-pastry chef. There is no suitable peasant-baker training, as in France for example, where a farmer can very well process his cereal harvest and sell bread. Some French peasant-bakers have such a bad image of the bakery that they would prefer to call themselves peasant-bakers, but it is the consumer who has trouble finding his way, it must be admitted. ... With the MAP, we have therefore set up an initial training course to cover all trades ranging from grain to bread. It is unfortunately not qualifying but three participants in this training nevertheless obtained their diploma of baker-pastry chef at the central jury! The training should be repeated this year.

This access to the profession of baker-pastry cook is certainly an obstacle to encouraging a farmer to become a farmer-baker. Another thing is to learn how to really make good bread... On the other hand, the baker who also wants to be a farmer comes up against access to land. But that is still not enough to grow wheat: a minimum of infrastructure is also essential. Or, you have to form partnerships, but that amounts, in fact, to dividing the professions. In my own case, I intend to collaborate, this year, with a farmer from Verlaine, Anne-Françoise Georges, in a medium-term vision - three or four years - concerning the interest in baking of the varieties that we will cultivate. I will lend a hand

Finding a peasant selection that works well is a work of at least ten or fifteen years; it is not a question of obtaining yield quickly but of finding real quality according to a given context

for all the manual part of the culture, which cannot be mechanized, but all the experiments must be done *in situ.* This could not be done in a vegetable garden, which is a bit like a laboratory and where we would lose everything that is specific to the farm which must remain, above all, an exceptional place of diversity, diversification, crossbreeding, meetings... I tried hard to work alone: market gardeners lent me a hectare of meadow, a farmer came to work the soil and sowed the seed that I had been given one year wheat, another spelled. One year like the other, I got absolutely nothing at all! Was it to blame the soil, the seed, the weather or the availability of the farmer who worked for me? The truth is no doubt that I am not a farmer. I will therefore now collaborate with a real farmer who will act according to her own calendar and especially with her own practices, exactly as she does for her other cereals. For a first year, we will probably sow one or two mixtures and will probably test a few micro-plots... No need to put too much pressure on ourselves and compromise a second year of collaboration in the event of failure. So I can't imagine more than one hectare to start with...

The weather - the weather but above all the weather - is therefore a major factor in *Li Mestère's ambition.* Finding a peasant selection that works really well is a work of at least ten or fifteen years. It's not about getting a return quickly; it is indeed a question of finding a real quality according to a given context. Reacclimating the spelled varieties kept in Switzerland, for example, will already take three or four years in order to pre-multiply the samples and then see which ones are still going really well here.

Possibly make crosses to improve them, then mixtures of populations to have the most answers in terms of genetic diversity, all this will require a few more years...”

Modern, the bakery?

“Let's repeat it, insists Alex Colin: our objective is not a return to the old just because it is old. Our desire is to use the old to try to reorient the evolution where it has slipped. Such an objective can be generalized, particularly with regard to the teaching given to the future baker or the future farmer. Only the track of industrialization was retained which would, it seems, facilitate and work. But it's a decoy: it didn't help anything at all! The little baker still works at night and more and more on the production lines... But what else is interesting about his job? Things have probably been simplified since we no longer need a baker to make, today, what we are sold for bread. A machine does it with a few maneuvers! As a result, there is no longer any trade at all and what is still taught, consequently, no longer has much to do with the baker's trade.

Has industrialization made this job easier? In fact, she scaled things back to the point of removing it altogether. But the guys that we continue to call bakers still get up at night to bake the dough pieces delivered to them frozen and, basically, the only thing left of their trade is to get up at night. Nice job facilitation...

As for us, the “alternative” bakers, we don't work at night because our bread is of high quality and can be sold and consumed without any problem for several days. But I had to completely relearn my trade when I decided to make sourdough bread! In my classes, sourdough is three meaningless lines in the middle of dozens of pages of industrial technique...
However, it was sourdough that gave me the passion for a profession which, at first, did not really interest me. Baking is an art of touch that allows you to adapt to flour, to dough as it is. But this power of adaptation is no longer taught and it has been lost. There is therefore no “unbakable” flour as claimed by the industry - which favors very puffy breads with very little crust, there are only questionable baking processes. Unfortunately, these are the ones that we perpetuate and that is why good bakers are rare...”

Info : www.limestere.be - info@limestere.be