

Using a multi-actor approach to getting lupins ‘back on the menu’ in The Netherlands: involving breeders, farmers, food and feed industry and consumers

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Abstract

The first initiatives aimed at increased lupin production in The Netherlands came from two high(er) value chains: the organic sector striving for regional feed production and the food industry looking for alternatives for soy-based products. As regional production is an added value for both market chains, an additional price could be afforded to compensate for the yield gap that developed over the years. Although this proved to be a good starting point for turning the downward spiral for lupins into an upward spiral, the barriers for a successful development turned out to come from many additional angles: a lack of knowledge on successful production among farmers, the absence of agro-chemicals allowed in the cultivation of lupins, the lack of infrastructure for collecting, drying and cleaning the lupins, the fear of food-producers to introduce a new and unknown allergenic ingredient to the production sites and the lack of knowledge among consumers were some of these additional barriers that needed to be addressed. To overcome these barriers, The Louis Bolk Institute started to cooperate with a great number of actors involved. In cooperation with food technologists and foodproducers new lupin based products were developed broadening the market for lupins grown for human consumption. Cooperation with a farmer union ensured that the allowance for necessary agro-chemicals was initiated and political support was organized at a regional and national level. Finally social organizations aimed at stimulating the public and political debate on protein transition were involved to get lupins better known among consumers and politicians as a new and healthy protein source. As a result of the involvement of all these different actors we are slowly seeing a rise in acreage and consumption of lupins in The Netherlands.

Keywords: lupin, multi actor approach, human consumption, the Netherlands

Introduction

Like in most other European countries the cultivation of grain legumes in The Netherlands has decreased dramatically since the end of the 20th century as a result of unfavorable crop-subsidies and cheap import of soy. With the continuous reduction of acreage, the whole market chain turns into a downward spiral: low acreages means low-breeding activities, low-breeding activities means less progress in yields while other crops do progress, creating an even larger yield gap between grain legumes and other competing crops (eg. cereals and oil-seed rape). In addition, the feed and food industries focus on cheap, imported grain legumes, mainly soy, added to the downward spiral. The negative effects of the disappearance of the grain legumes not just from the agricultural landscape but also from the diets are manifold and have come to such levels that it has started to attract the attention of politics (both EU and national). A large dependency to imported soy, making EU vulnerable especially with upcoming markets like China, the disappearance of biodiversity in the landscape, causing a reduction in insects and birds and increasing health issues related to the high animal product intake in large parts of society. This could mean a turning point for grain legumes in Europe in general and of lupins in particular. Especially lupins combine unique properties making them attractive for the modern day consumer: high in protein, low in starch and high in fiber like components. However, getting lupins back on the menu for both farmers and consumers means that work has to be done at all the different levels of the market chain simultaneously involving many different actors.

Results and discussion

The initial market opportunity

The start of our work with grain legumes came from the need in the organic sector to close nutrient cycles on a more regional level. A whole range of legumes were tested, among which *L. angustifolius* and *L. luteus*. The main attitude towards lupins was that the seeds were very interesting from a nutritional point of view, but yields were too low to be economically feasible. In 2007 however interest in lupins grew from the food industry that wanted to know whether a more regionally organized supply chain for lupins would be feasible. Field trials indicated that there were great varietal differences, but with the right variety and an additional price for regionally produced lupins, production could be done locally. But progressing from these early field trials to building a viable market chain meant we needed help.

Farmers, seed companies and farmer unions

To get farmers interested in new crops like lupins, means that you have to start with the more innovative farmers. But even for them there are numerous barriers. Getting enough sowing seeds of the right variety in The Netherlands is already one of the basic things. As the cultivation of grain legumes in general and lupins in specific is very underdeveloped in The Netherlands, seed companies only have a very limited amount of varieties available. For lupins they often have just one variety which they can supply and the knowledge on the suitability of this variety for feed or food purposes is limited. As only a few of the sweet varieties of lupins are sweet enough to be used for human consumption the Louis Bolk Institute started to organize the ordering of seeds from varieties that had proven to be suitable in our field experiments. We started to cooperate with a farmers union (NAV Dutch Arable Agriculture Union) that made inventory plans on how much acreage would be sown for the different processors. Also seed companies (Van Dijke Semo, Innoseeds) were involved in organizing the logistics.

But seed supply wasn't the only farmer obstacle. Since most of the grain legumes have largely disappeared from the agricultural landscape since the 80's and 90's in The Netherlands, knowledge on how to grow them has been largely lost for current generation of farmers. To revive this knowledge The Louis Bolk Institute started to organize farmers meetings together with the NAV and to make cultivation guides to support the farmers and contractors. For conventional farmers the problem was not just a lack of knowledge, but also a lack of agro-chemicals available for lupin-cultivation. The national body for allowance of agro-chemicals (CTGB) did not recognize lupins as a harvestable crop, but merely as a green manure. No herbicide or fungicide was allowed in the cultivation of lupins, forcing conventional farmers to reduce weeds mechanically with weed-harrows or hoeing equipment. However as weed control in all other crops is done chemically, a lot of the conventional farmers do not have hoeing or harrowing equipment and do not know how to use them properly. So cultivation guidance also included farmers to get themselves re-acquainted with this.

At the same time the NAV used it's influence at a policy level to get some of the necessary agro-chemicals accepted in the cultivation of lupins.

Food industry and food innovation

The first initiative for regional lupin production came from a start-up company in meat substitutes: Meatless. Setting up local production gave the producer several advantages: more control and assurance over the supply chain (less risks of contamination) and an added value to the product that he wanted to market. An extra advantage of this control over the supply chain was that a producer could ask for specific varieties or growing conditions for the lupins, something that cannot be gained from an anonymous market. A local supply chain meant that for farmers agreements could be made ahead of the growing season: acreages to be grown and pre-set prices. The agricultural union NAV started to play a role in coordinating these agreements, making collective ordering of sowing seeds possible and assuring prices for which the farmers were able to grow the lupins locally. They also started to coordinate the collection, drying and cleaning of the seeds by a specialized company (Blonk). However, for cultivating and processing lupins economically the amount of food-producers needed to grow. Fortunately the first initiatives created a lot of media attention, triggering additional producers to get interested in lupins.

Especially another start-up company: The Vegetarian Butcher created a lot of publicity around lupins. In addition to this the Louis Bolk Institute started to involve a food technologist (MFH-pulses) and the main producer of lupin flours and bits and grits (LI Frank) to help create new food stuffs based on lupins: low-carb bread, lupin ice-cream. Another innovation company (Color and Brain) created a new technology for creating meat substitutes based on lupin flour getting a large producer of vegetarian products interested in adopting this new technology (Vivera). Lupins started to be known more and more for their unique qualities of high protein, low starch and high fibre like components, perfectly fitting the modern day consumer. Small initiatives started to promote the use of the whole bean as well (powerpeul.nl and lupinfood.eu) making the beans and their flour available to the general public. Slowly the market opportunities for lupins as a new 'super food' are increasing.

Breeders

Creating a market for lupins with companies interested in locally grown lupins is a good start, but is not enough. The early developments in locally cultivated lupins are still very fragile. Lupins can only be grown locally if the producers pay an additional price for these lupins. The gap between world market prices and local prices is still quite big, which in the long run wouldn't hold. There is a need for more locally adapted, more stable producing varieties. Again however we find ourselves in a deadlock situation. For breeders to invest in a new crop, they need to be assured with sufficient acreages of cultivation. As these acreages are not there yet, they are very reluctant to engage. Without these new and improved varieties however, acreages are not going to grow that fast or maybe even not at all, creating a catch-22 situation. In order to make progress in breeding The Louis Bolk Institute started a small breeding program for white lupins (*L. albus*) while at the mean time starting cooperation with established breeding companies like Saatzucht Steinach to work out new and innovative ways to come to locally adapted varieties for the Dutch climatic conditions, meeting the criteria needed for human consumption. Also the cooperation with small and independent breeders in The Netherlands and in Denmark is important as they can make

Conclusions

Trying to get grain legumes back on the menu for both farmers and consumers is something that is not done easily. Obstacles include: few available suitable varieties that perform well under Dutch conditions, insufficient seed supplies of these suitable varieties, insufficient knowledge on how to grow lupins, no admittance for the use of agro-chemicals, a small and fragile developing lupin food industry and little logistical infrastructure for collection, drying and cleaning. By involving a lot of different actors in the process we are trying to overcome most of these obstacles in creating innovative and locally based market chains. Farmer unions, breeders, food technologists, small and large food producers and policy makers all have to be involved to turn the tide for lupins as the food trend.