



InVivo — New crop integration to limit soil degradation and provide farmers with alternative sources of income

InVivo, parent company to Semences de France, has launched a project focusing on lupin and linseed as crop varieties that can be used for crop rotation. The aim is to limit soil degradation, while also providing alternative feed and food crops for farmers' commercial repertoires. By building the market for lupin and linseed, InVivo aims to help align all the actors in the value chain around mutual nutritional, agronomic, environmental and economic benefits. Initial objectives of the linseed and lupin project are:

- To track and support 2,500 (4,000 by 2024) farmers' experience of growing linseed as a primary crop with strong market potential due to its high Omega 3 content and range of applications from food to paints, cosmetics and feed for food.
- To introduce 1,000 farmers to lupin production as an alternative protein source nearly on par with soya beans and as a type of plant that can work for crop rotation in more acidic soil.

The impetus

Reducing agricultural reliance on chemical inputs is an environmental priority, and increasingly, an economic goal. Farmers are under pressure to deliver ever-greater yields, translating to an increased use of fertilizers and pesticides, both environmentally and financially unsustainable. The price to consumers of wheat, maize, and barley, for example, is increasingly steep as nitrogen costs have trebled. By introducing diversified crops into farmers' rotations, we can reduce these inputs, boost soil health and biodiversity, and provide crops with high nutritional value for humans and animals.

The consumer market for vegetable protein is increasing, and with it, the opportunities for crops like linseed and lupin. Linseed, long used in animal feed, is now being prized in the form of linseed oil for its high Omega 3 content. Lupin offers a protein source nearly on par with soya beans.

The solution

InVivo considers that for any crop-related project, including linseed and lupin, there must be rigorous testing of different varieties to identify the best that serve environmental and food market goals. The company has been working with linseed for 10 years, while lupin is a newer seed.

They have found that increasing the use of lupin and linseed in crop rotations has many benefits: promoting the sanitary cycle; reducing the proliferation of diseases that affect wheat from one season to the next; helping sequester nitrogen in the soil; reducing the need for chemical applications; and improving biodiversity of soils while reducing carbon (through cuts in emission-heavy inputs).

Building on its crop testing, InVivo developed partnerships with farmer cooperatives in its network to evaluate the behavior of the varieties in different pedo-climatic contexts. This helped the company determine which regions are the most relevant for integrating the crops into farmers' rotations.

To ensure a market for the crops, InVivo worked with various buyers to evaluate the varieties' technical characteristics like nutrition, acides gras, protein level, Omega 3 and texture. This was done to make sure the crops aligned with the specifications of the buyers depending on the anticipated usages of the lupin and linseed.

InVivo then produced and multiplied the agreed upon seeds to ensure replicability over time. These seeds were planted and integrated into pre-existing crop rotations and harvested by farmers within participating cooperatives. The regenerative benefits of the crop diversification was tracked by a traceability tool called SMAG.

Farmers could then sell the lupin and linseed to buyers according to the traced properties and volumes requested.

Two key learnings

1. Working with cooperatives to select farmers is essential:

It takes time and effort to convince farmers to change their practices and move away from a less time intensive agro-chemical dependent model, to looking after more complex crop rotations. InVivo has learned that cooperatives are essential for selecting which farmers are willing to change their practices. Those selected form an initial nucleus of demonstration farmers help convince others in the region.

2. Bringing the end user on board is vital, but takes time:

To scale the project, demand is needed. Farmers will grow what the market wants, so it is vital to develop partnerships with end-users. Buyers often require a large volume of the crop, and it took InVivo 10 years to build the current delivery levels of linseed. It is important to note that organizing price guarantees and contracts for production takes time as it is challenging to guarantee a certain quantity of a new crop. It is therefore integral to keep explaining the opportunities to the end user.



OP2B Pillar 2:

Developing product portfolios to boost cultivated biodiversity and increase the resilience of the food and agriculture models

The pillar defines specific actions within the value chains of OP2B members that can increase the number of ingredients sourced so we are less reliant on just a handful of crops. It also aims to further develop provenance-based and local sourcing, and expand the genetic variety of crops grown. This is to regain food diversity and localized biodiversity specificity in agriculture as a powerful lever to protect and nurture biodiversity. OP2B has carried out a series of case studies of cultivated biodiversity initiatives by member companies.

This case study falls under pillar 2.

What's next?

Political support is needed to create systemic change in agriculture. InVivo hopes governments will back the sustainable growing of linseed and lupin, with their proven benefits to biodiversity and soil health. Subsidies and incentives that can be withdrawn are not sustainable: currently fava beans and peas receive subsidies but if those subsidies end, the prices will drop and the crops will no longer be grown. In the end, environmental solutions must also be economically viable over the long term.

Impacts as of 2021

- Non-GMO, locally-sourced linseed and lupin, consistently met industry needs, including yields.
- Introduction of lupin and linseed into crop rotations increased linseed value for leading agro-industrial companies as well as Bleu-Blanc-Coeur, while improving the environmental and social performance of wheat crops for a multinational food producer (lower inputs; better nitrogen capture; more biodiverse and healthy soils).

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