

COTOPAXI - new lupin protein & oil crop for Europe

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Andean Lupin is one of the “lost crops of the Incas” like quinoa and chia. Andean lupin grows in the same ecozone as potato. Andean lupin bean composition is comparable with soybean.

Andean lupin is one of the “lost crops of the Inca’s”. Andean lupin beans are rich in protein (45%) and vegetable oil (20%). This makes Andean lupin (*Lupinus mutabilis*) a potential important crop. There are only four lupin species available for human consumption. Three of them are from the old world, the white, blue and yellow lupin, while the Andean lupin comes from the new world. Research on lupins, also the Andean lupin, started in the 1920’s and 30’s in Europe by the legendary Professor Dr. Reinhold von Sengbusch. He succeeded to breed sweet lupin cultivars for all the four lupins, including the Andean lupin, with acceptable crop yields. Unfortunately the sweet Andean lupin variety went lost in Europe’s dark times.

Breeding for Andean lupin started again in the early 1970’s. Several national and European breeding projects attempted to breed Andean lupin for sweetness and high yields. These projects terminated because of loss of interest in leguminous crops in Europe in the early 90’s, imposed by the Blair House Trade Agreement on leguminous and oilseed crops. This marked also start of large scale EU-imports of GMO soy based plant protein for animal feed, further outcompeting EU legume production. Hanze UAS together with others initiated in 2015 the H2020 BioBased Industries Joint Undertaking (BBI-JU) research project [LIBBIO](#) for developing the Andean lupin breeding, cultivation, supply chain development and its biorefinery processing. This was made possible by an Andean lupin pre-breeding collection established by Kiemkracht, the innovation alliance from Product Board Arable Products and the Innovation Network of the Ministry of Agriculture, Nature and Food Quality. Eventually LIBBIO project succeeded in obtaining Plant Breeders Rights which were granted to Vandinter Semo BV on 29th December 2020 for the Andean Lupin variety COTOPAXI. COTOPAXI is tangible result from the project LIBBIO. LIBBIO was selected by EC DG-Research and [BBI-JU](#) as [success story](#).

We are facing a plant-protein transition which is massively supported by Dutch Parliament who adopted the “National Protein Strategy” (NES Nationale Eiwit Strategie).

Main aims of the Dutch “National Protein Strategy” (NES) are:

- 100,000 hectares of leguminous crops for protein production in the Netherlands by 2030 which have improved soil quality and biodiversity
- Farmers are rewarded for growing protein crops
- New business models for local protein crop supply and value chains
- New healthy, tasty and sustainable protein food and feed products

COTOPAXI will definitely contribute to all these targets!

Andean lupin is rich in protein and oils. Andean lupin oil is because of its excellent fatty acid composition suited for food applications like margarines and mayonnaises and also for cosmetic applications especially hair care products, lipsticks and nourishing anti-aging skin care products. Andean Lupin bean is also rich in proteins, oligosaccharides, alkaloids and bioactive components. Andean lupin proteins can be used as functional food ingredients, nutritious meat-analogues or



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alternatives and as animal feed. Oligosaccharides have functional food applications because of their fermentative (prebiotic) potential in the human large intestine. Alkaloids are of interest because of their medical potential as anti-cancer medicine and as biodegradable natural crop protection agents. Andean lupin bioactives are suited as ingredients in anti-aging cosmetics and in functional foods. Andean lupin contributes to the plant-based protein transition and to EU policy becoming more independent from foreign protein imports.

The Andean lupin COTOPAXI contributes to farmer income, sustainable and circular agriculture, profitable processing and biorefinery and sustainable natural products for European consumers.



COTOPAXI Andean lupin field on a sandy soil in N-Netherlands for seed propagation in 2019. The machine harvested yield was 2,7 tons of Andean lupin beans rich in proteins and oils.