

# For a successful protein transition: what measures are needed?

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Implemented to support the national economy in response to the impacts of the COVID-19 pandemic, the France Relance plan (French recovery plan) allocates 100 million euros to the French strategy on plant proteins. Among the objectives set, the focus is on increasing the acreage of legumes by 2030 and reducing dependence on imports of protein-rich crops. Despite the many environmental, geopolitical/strategic and health benefits of legumes, this productive sector is currently constrained by the lack of competitiveness of local production and the absence of coordination and shared strategies between stakeholders in the sector.

This *Policy Brief* presents a scenario for 2030 that is compatible with the protein transition objectives set out in the recovery plan and the French national low-carbon strategy (SNBC), then describes its implications in terms of investment and identifies a set of measures to unlock the sector.

## KEY MESSAGES

Based on the development of legumes, the "protein transition" supported by the French recovery plan is a prerequisite for achieving numerous environmental objectives: a reduction in direct emissions from mineral fertiliser use, the re-diversification of cropping systems for a reduction in plant protection products, and an increase in soil organic carbon. It will also generate other benefits, whether nutritional (in line with the French nutrition-health programme), geopolitical/strategic (a reduction in soya imports) or socio-economic (job creation in the agri-food industries).

Given the lack of competitiveness of French legumes compared to imports, investments need to simultaneously target five dimensions of the organisation of the sector: (1) stakeholder coordination and market structure in order to provide new outlets for production; (2) R&D in plant breeding, the development of agronomic solutions and farm advisory services; (3) agricultural equipment for the development of field crops,

especially in organic farming, in line with the SNBC objectives for 2030 (26 % of land under organic farming); (4) industrial equipment for downstream collection/storage/processing; and (5) changes in consumer practices to (i) increase the proportion of legumes in diets, (ii) foster the "willingness to pay" for animal products for which the substitution of imported soya will lead to higher production costs.

The budget provided for in the plan falls short of tangible investment requirements for production/processing and must be accompanied by two sets of complementary measures: market organisation measures to protect French supply chains, at least temporarily, from international competition and thereby enable their development; and incentive measures for private investments by stakeholders in the sectors (taxation, CAP aid, etc.), in order to foster a stable market environment in which economic actors feel that they can be competitive.

## 1. THE PROTEIN TRANSITION GENERATES MULTIPLE BENEFITS

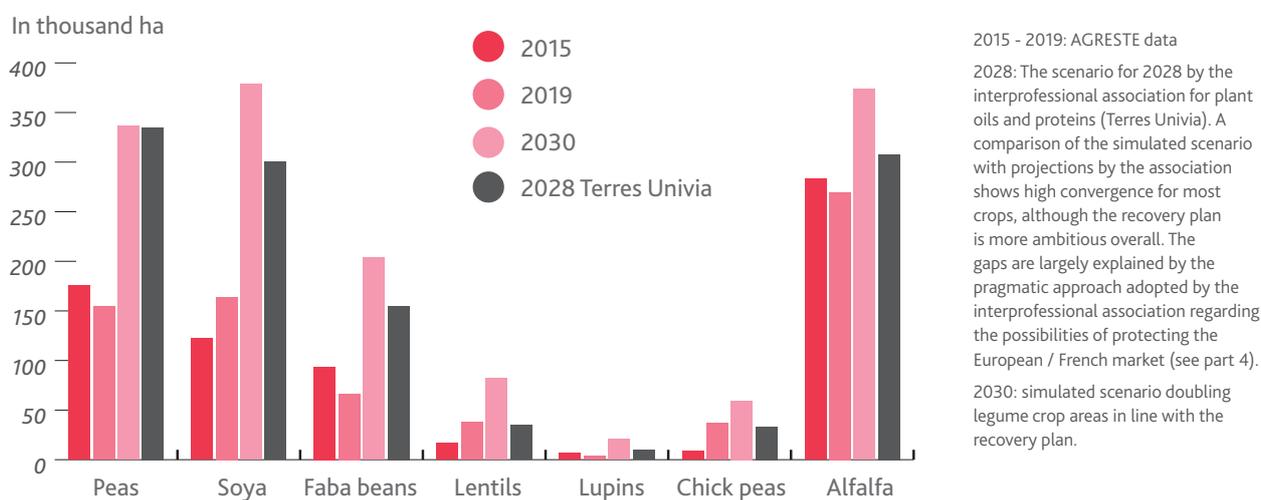
From an environmental viewpoint, a protein transition based on legumes would first enable a better management of fertility at the territorial level, thereby reducing the agricultural sector's climate footprint and its impact on biodiversity. Thanks to symbiotic fixation by legumes in crop rotations, farms would limit mineral fertiliser use and reduce associated greenhouse gas emissions, nitrogen loss and biodiversity change.<sup>1</sup> Starting from 2015 crop areas and applying the objective set out in the recovery plan (doubling surface areas under legumes – see Figure 1), our model shows that the potential for reducing mineral nitrogen fertiliser use is around 119 000 tN (5 % of French use in 2015). Greater agricultural diversification also reduces plant vulnerability to parasites and diseases<sup>2</sup> and limits the need for plant protection products, with their well-known risks to farmers' health<sup>3</sup> and to agricultural biodiversity.<sup>4</sup>

From a strategic viewpoint, the COVID-19 crisis has demonstrated the risks associated with excessive dependence on imports of soya for French livestock farms. In this context, an increase in areas under legumes (forage and grain) would help to increase feed autonomy for farms and to develop animal feed sectors based on French production, thereby reducing soya imports by 30 %, an objective that is also consistent with the

French strategy to combat imported deforestation.<sup>5</sup> In certain highly specialised crop regions, such a scenario is also based on the development of outlets for forage legumes for which the ratio of transport cost to value added limits the possibility of transportation. The (re)deployment of local livestock farming systems and virtuous anaerobic digestion processes in field crop areas could provide such outlets, simultaneously generating other environmental services (fertility transfers and reductions in mineral fertiliser use, the restoration of permanent grasslands for ruminant livestock).

From a nutritional viewpoint, an increase in the consumption of plant proteins is consistent with current guidelines (WHO, EFSA, ANSES). The objective for legumes set by the French nutrition-health programme of 20 g/person/day could therefore be largely covered by domestic production. This means that current diets need to change: in France, average protein consumption is 100 g/person/day, around 60% of which is of animal origin, whereas 50 to 60 g of protein/adult/day is enough to cover most nutritional requirements.<sup>6</sup> To be beneficial, an increase in the consumption of plant proteins from legumes must nevertheless be based on minimally processed or unprocessed foods (such as pulses, tofu, falafel, etc.). Their consumption in the form of protein ingredients used in ultra-processed foods raises the question of the health risks associated with a high consumption of such products (e.g. new allergens, obesity, diabetes).<sup>7</sup>

**FIGURE 1. Estimation of crop areas according to two scenarios**



1 Sutton M.A., Howard C.M., Erisman J.W., et al. (2011). The European nitrogen assessment: sources, effects and policy perspectives. Cambridge University Press  
 2 Lechenet M., Dessaint F., Py G., et al. (2017). Reducing pesticide use while preserving crop productivity and profitability on arable farms. *Nature Plants*, 3 (3), 17008.  
 3 INSERM (2013). Pesticides – Effets sur la santé – Synthèse et recommandations. Paris, *Expertise collective*, 146 p.  
 4 Geiger F., Bengtsson J., Berendse F., et al. (2010). Persistent negative effects of pesticides on biodiversity and biological control potential on European farmland. *Basic and Applied Ecology*, 11 (2), 97-105.

5 MTEs (2018). Stratégie nationale de lutte contre la déforestation importée 2018-2030. Paris, Ministère de la Transition Écologique et Solidaire, 31 p.  
 6 EFSA (2017). Dietary Reference Values for nutrients – Summary report, European Food Safety Authority, 92 p.  
 7 Schnabel L., Kesse-Guyot E., Allès B., et al. (2019). Association Between Ultra-processed Food Consumption and Risk of Mortality Among Middle-aged Adults in France. *JAMA Internal Medicine*, 179 (4), 490-498.

Finally, from a socioeconomic viewpoint, our model reveals a requirement of around 1 000 FTEs to develop the agro-industrial production facilities needed to process the additional production volumes. The legume plant protein sector could thus become an opportunity to at least partially offset the job losses expected in livestock sectors further to a reduction in the consumption of animal proteins, which has already begun.<sup>8</sup>

## 2. LONG-STANDING LOCK-INS IN THE LEGUME SECTOR

Over the last few decades, most upstream and downstream stakeholders have shown little interest in investing in the legume sector. This situation is largely due to the trade negotiations of the 1950s and 1960s (the Dillon Round),<sup>9</sup> during which, in exchange for the protectionist measures established in the framework of the CAP (especially for cereals), Europeans agreed to allow legumes (including soya) to enter their territory with zero customs duties. Consequently, it is now possible to purchase imported grain legumes which have a better quality and lower price than most local products, especially in the animal feed sector.

In view of the benefits associated with greater protein autonomy (or the risks associated with such high dependence), numerous plans have sought to reverse this situation, but with limited results. Nevertheless, it is thanks to these past attempts that oilseed sectors have developed, enabling France to achieve a high level of protein autonomy (through the utilisation of rapeseed and sunflower oil cakes), but without the agronomic, environmental and nutritional benefits of legumes. These plans also led to the temporary development of peas, but several difficulties, especially at the agronomic level, brought this sector to a sudden halt in the mid-1990s.

Agricultural production of legumes is currently low, with very small crop areas (2 % of the UAA). Few economic actors are interested in legumes and the sector suffers from a lack of structure, with the exception of a few niche markets. Seed producers do not have the critical market size needed to invest in plant breeding. Farmers lack territorialised technical references, stable yields and prices. Collectors have little storage capacity and factories have limited processing and product engineering tools to develop these products. Finally, in recent decades consumers significantly reduced their purchases of pulses.

However, in recent years some products have shown real dynamism, with the return of pulses, and especially the significant development of foods made with locally produced soya. Several large companies have also made investments in the processing of plant proteins and an increasing number of SMEs are specialising in high value-added secondary or tertiary processing stages.

<sup>8</sup> Larochette B. & Sanchez-Gonzalez J. (2015). Cinquante ans de consommation alimentaire : une croissance modérée, mais de profonds changements. *Insee Première*, 1568, 4.

<sup>9</sup> <https://archives.eui.eu/en/fonds/84520?item=CM2%2F1962-13.06>

Finally, there has been a recent boom in protein ingredients in the agri-food industry, the specialised nutrition sector and other sectors of production (pharmaceuticals, cosmetics, biomaterials, etc.).

## 3. FIVE COMPLEMENTARY DIMENSIONS TO UNLOCK THE SYSTEM

Faced with these constraints, a simple policy to support tangible investments will not be enough if it is not accompanied by a strategic and economic vision for the sector. Five key types of investments must be prioritised in order to truly unlock the sector.

The first type of investment concerns the simultaneous improvement of the level of coordination between actors in the sector and their knowledge of markets. A better understanding of the needs of buyers and a better organisation to meet these needs will enable actors to find new outlets, without which all the tangible investments in the world would be irrelevant. To achieve this, human resources need to be increased within the structures working to develop legumes at the national and territorial levels: the interbranch organisation and all of the 14 ONVAR structures (French national agricultural and rural organisations). These stronger linkages between operators would help to not only identify market and segmentation opportunities, but also to ensure the conditions for better sharing of value and knowledge throughout the sector.

The second category of investments, whose amounts are difficult to estimate, concerns "agronomic solutions": research on plant breeding and technical support to address unstable yields that tend to discourage farmers from investing in legumes. An increase in funding aimed at research on plant breeding (research institutes, technical institutes, private companies) will improve the quality of seed and reduce its cost for farmers. The development of territorialised technical references and decision support tools, especially for organic systems, is also crucial to ensure farms are competitive and to increase crop areas and volumes in the long term.

A third area concerns tangible investments in the agri-food industries: these represent around 1.1 billion euros, divided between the three main outlets for agricultural production (animal feed, human food, protein ingredients) and storage.

This amount (€ 110 m/year for 10 years) is higher than the amount provided for in the recovery plan for the French strategy on plant proteins (€ 100 m/year for 2 years), but well below the amounts of tangible investments made annually by the agri-food industries (€ 13 bn/year).<sup>10</sup>

The fourth type of investment concerns agricultural equipment. Our simulations show that to be consistent with the indicative SNBC trajectory, which sets the target of 26% of

<sup>10</sup> Financial needs in the agriculture and agri-food sectors in France (fi-compas 2020).

field crop areas under organic farming by 2030, the majority of legume crop areas should be developed within organic systems. However, ensuring the economic viability of these farms requires additional equipment for mechanical weeding and organic fertilisation of crops – an investment of around 1.5 to 2.5 billion euros, according to our calculations. From this perspective, the budget provided for in the recovery plan for agricultural equipment (250 million euros) should benefit organic farms.

Finally, a last type of investment concerns changes in consumer practices. In the human food market, changing people's habits is the priority in order to provide an alternative outlet for legumes. Investments in marketing policies should be considered,<sup>11</sup> especially if they adopt a participatory approach (e.g. cookery workshops at school). More direct market intervention measures can also become an option (e.g. differentiated taxation, regulation of school meals), in particular in the animal food sector, where the price gap between food produced using local feedstuffs and food based on imported products is still high.

## 4. CHANGING THE MARKET ENVIRONMENT

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With current market conditions, the take-off of the legume sector is difficult to imagine. There is a risk of encountering the same difficulties as those experienced during the previous protein plans (dependence on subsidies and maintenance of

the competitive disadvantage in relation to imported soya). A temporary protection period for French (and European) products seems necessary to ensure that companies develop a sort of "import substitution industrialisation". This period would make it possible to achieve economies of scale, to test innovations and to explore new possibilities for production in an economic context "corrected" of its lack of competitiveness and market imperfections.<sup>12</sup>

In terms of specific measures, the introduction of non-tariff barriers can be a solution to avoid importing what farmers are not allowed to produce locally (e.g. GMO soya) and to combat imported deforestation—its political complexity should not be underestimated, however. Given the ecological value of legumes, the recoupling of CAP subsidies can also be an effective measure, provided that there is no upper limit on eligible surface areas, that cropping methods are agro-ecological and that the subsidies actually contribute to structuring the sector. The development of "system" agro-environmental measures fostering an increase in the share of legumes in crop rotations can also be considered.

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<sup>11</sup> George K.S., Roberts C.B., Beasley S., *et al.* (2016). Our Health is in Our Hands: A Social Marketing Campaign to Combat Obesity and Diabetes. 30 (4), 283-286.

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<sup>12</sup> Stiglitz, J. E. (2002). *Globalization and its Discontents* (Vol. 500). Norton: New York.

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