

PROSPECTS FOR DOMESTIC PLANT-BASED PROTEIN

Meat and dairy products represent excellent sources of dietary protein but consumers are increasingly seeking alternatives, citing health, environmental, ethical, and social reasons. Cultured meat, fermentation, insects and algae can fall under 'novel foods' legislation, while plant-based products often rely heavily on imports.

A real opportunity exists to improve food crops for domestic production.

Target crops and traits

Can we open up more food applications for widely-grown protein sources – wheat, barley, oats, oilseed rape, pea and faba bean – which are still mainly used for feed?

Alternative food crops including minor legumes (soybean, chickpea, lentil, lupin), grains (quinoa, buckwheat) and oilseeds (sunflower, hemp) provide an opportunity.

Biorefineries could extract significant protein from leafy crops, crop trash, and processing waste streams (defatted oilseed meal, vegetable peelings etc).

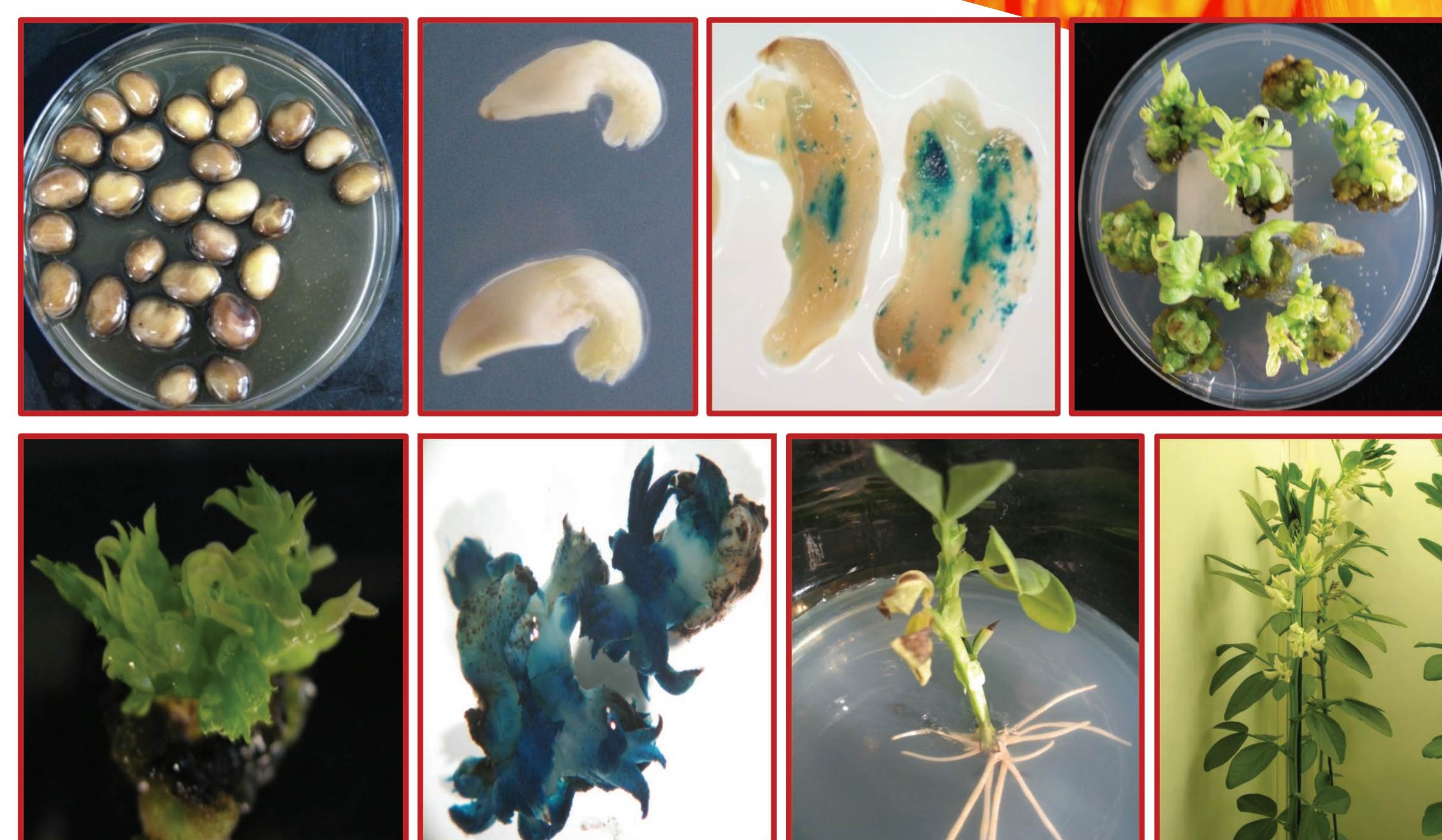
Improvements to crop adaptation, yield, resilience, and resistance to pests and diseases are required to make domestic production competitive. Protein content, texture, flavour and nutrition would also be targets for improvement.

Next steps

Use both plant breeding and biotechnology to improve existing crops and adapt novel crops to UK conditions.

Ensure agronomy research into effective weed, pest and disease management, whilst supporting low emissions and increased biodiversity.

Co-design with end-users and consumers to emphasise processing, functionality, nutrition and flavour traits.



Transformation and regeneration in faba bean



Variation in maturity across soybean varieties in Niab trials



Wheat varieties with contrasting gluten content



Selection in early generation faba bean crosses

Niab research on protein crops is supported by several sources including Bezos Earth Fund, Defra (Pulse Crop Genetic Improvement Network), Defra/Innovate UK (10052996) and BBSRC (BB/W019221/1)