NIAB

Socio-economic impact of NIAB research

IMPACT STUDY

NIAB research delivers 18-fold return to the wider UK economy

An independent assessment of the value of research taking place at crop science group NIAB has revealed an 18-fold return on investment to the wider UK economy through improved production efficiency, economic growth, import substitution, export earnings and inward investment.

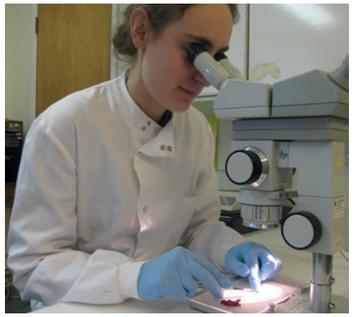
The study, by economists Brookdale Consulting, focused on five key areas to capture the broad spread of crop-related science and innovation now covered by NIAB:

- Variety and seed testing
- Potato agronomy
- Strawberry breeding
- Concept vineyard
- Legume pre-breeding

In each of these five areas, together accounting for around 20% of NIAB's total research income, the study identified a high-level of ongoing actual impacts as well as potential future impacts, reflecting NIAB's unique interconnecting role between fundamental science and practical application.

The case studies also highlight the broad range of routes through which NIAB is delivering socio-economic value and impact, including the provision of statutory services to the plant breeding and seeds sectors, developing innovative agronomy solutions for potato growers, breeding market-leading soft fruit varieties, supporting growth in the UK's emerging vineyard sector, and supplying new traits and germplasm to support genetic improvement in legumes.

This leaflet summarises the findings in each of the five R&D case studies



Variety and seed testing

Since its establishment 100 years ago, NIAB has pioneered the development of internationally recognised plant variety and seed testing systems which have underpinned the successful evolution of modern plant breeding and crop production.

NIAB is the largest crop trialling organisation in the UK, providing statutory variety evaluation services on behalf of Government to support regulatory decisions, as well as for the levy boards and plant breeding industry as part of the Recommended, National and Descriptive List systems.

NIAB also provides statutory seed certification services on behalf of Government.

The economic impacts of NIAB's contribution were calculated in the following areas:

- Plant breeders are encouraged to invest and innovate, knowing their varieties are independently assessed, their intellectual property is protected, and that seed supplies are well-controlled;
- Growers can be confident that certified seed is quality assured, and save time in selecting varieties offering a genuine improvement in performance and quality over older varieties;
- Industry benefits from ongoing productivity increases delivered through improved varieties.

The combined Gross Value Added (GVA) attributed by the impact study to NIAB's actual contribution to plant variety and seed testing at UK level over 10 years was £74 million.

"The 18-fold return on investment identified compares very well with other research-based organisations in the sector."

Brookdale Consulting

Potato agronomy

NIAB CUF is a leader in applied potato research, with demonstrable benefits for the industry in terms of improved productivity, cost-savings and resource-use efficiency. The impact study focused on the economic contribution of the following three areas of NIAB CUF research:

- Irrigation scheduling
- Yield forecasting
- Agronomy and varietal advice

The NIAB CUF irrigation scheduling model combines meteorological data with canopy, variety and soil data to calculate irrigation requirements. This delivers benefits to potato growers in terms of improved yields, water-use efficiency and enhanced control of some diseases such as common scab.

The NIAB CUF potato yield model combines location, planting date, variety type, management, emergence and canopy data to provide a forecast of final yield and tuber size distribution along with the optimum desiccation date. This early forecasting service saves costs by helping growers meet contracted requirements.

NIAB CUF also provides bespoke advice to growers on a range of other agronomic issues, from varietal selection to developing effective agronomic approaches for new varieties so de-risking their commercial introduction.

The combined Gross Value Added (GVA) attributed by the impact study to NIAB's actual contribution to potato agronomy at UK level over 10 years was £25.5 million.

Strawberry breeding

NIAB EMR is a leading breeder of strawberries, in recent years displacing the dominance of Dutch June-bearer varieties, with NIAB EMR's high-performing Malling™ Centenary variety now accounting for 60-70% of the UK market.

A key contribution of NIAB EMR has been to develop higher-yielding varieties with extended season of production, improved fruit quality, better picking efficiency and reduced waste.

New varieties are in the pipeline offering further benefits in terms of disease resistance and consistent yield profile.

NIAB's success relates to its multi-disciplinary research combining scientific knowledge of yield and quality, development of molecular markers, understanding pest and disease control methods and a focus on reduced growing costs.

NIAB EMR is also leading research into more resource-efficient growing systems and improved management, which are also key to supporting productivity growth in the soft fruit sector.

"NIAB occupies a unique position within the UK plant science landscape, providing a vital translation service between fundamental science and its practical, commercial application."

Brookdale Consulting

The combined Gross Value Added (GVA) attributed by the impact study to NIAB's actual contribution to strawberry production at UK level over 10 years was £298 million.

Concept vineyard

NIAB EMR has been involved in the British wine industry since 2015 when it recognised the rapid growth taking place in the sector, and the need for R&D to support this growth. A research vineyard was planted in 2015, followed in 2016 by the establishment of a consortium of NIAB EMR and leading UK vineyards to fund and co-ordinate R&D support to the sector.

NIAB's research covers growing systems and resource-use efficiency, genetic improvement and pest and disease control.

NIAB EMR's one-hectare concept vineyard provides a platform to test solutions and de-risk them for commercial growers. In its first year, the research vineyard produced a yield of 8 t/ha, expected to rise as the vineyard matures with the aim of producing 12 t/ha.

Compared with the average UK vineyard yields of between 4.4 and 5.9 t/ha, NIAB is demonstrating what is possible under conditions in the UK through improved management and growing systems.

As the UK wine industry adopts NIAB's methods, the productivity of this rapidly expanding sector will increase.

The combined Gross Value Added (GVA) attributed by the impact study to NIAB's potential contribution to vineyards at UK level over 10 years was £101 million.

"NIAB's critical mass of skills, facilities, networks and expertise has a strong contribution to make to future challenges including climate change adaptation and resilience, sustainable intensification, economic growth and food security."

Brookdale Consulting

Legume pre-breeding

NIAB is a leader in pre-breeding research, providing a vital link between the discoveries and advances taking place in fundamental plant science and the translation of that new knowledge into traits and breeding material that commercial plant breeders can use to develop improved crop varieties with beneficial characteristics.

NIAB's pre-breeding programme has already supported ongoing productivity improvements in major crops such as wheat. However, the impact study considered the potential contribution of pre-breeding to improve the performance of legume crops such as field beans.

Field beans offer a potentially valuable break crop with nitrogen-fixing and soil organic matter benefits, and potential to displace imports of soya as a home-grown protein source.

The study estimated that a 3-year pre-breeding programme could support improvements in disease resistance, yield and protein content of home-grown field beans to compete with imported soya and substantially grow the volume of the crop in the UK, and also provide a sustainable alternative to other break crops.

The combined Gross Value Added (GVA) attributed by the impact study to NIAB's potential contribution through legume pre-breeding at UK level over 10 years was £28.5 million.

"At all levels, the focus of NIAB's applied research activity is to improve the productivity, efficiency and resilience of UK agricultural and horticultural crop production. This independent study provides a resounding thumbs-up to the value and impact of our research."

Dr Tina Barsby OBE, NIAB Chief Executive

Summary of NIAB impacts

The following table summarises the ongoing costs and benefits of NIAB's economic contribution, based on the case studies selected to provide an overview of research activity taking place at NIAB.

For every £1 spent at NIAB, the impact study concluded that at least £17.60 is returned to the wider UK economy through improved production efficiency, economic growth, import substitution, export earnings and inward investment.

Research area	Actual or Potential	Total Gross Value Added (GVA) over 10 years	Attribution to NIAB	Net GVA attributable to NIAB at UK level over 10 years
Variety & seed testing	Actual	£ 147.8 million	50%	£ 73.9 million
Potato agronomy	Actual	£ 25.6 million	100%	£ 25.6 million
Strawberry breeding	Actual	£ 297.7 million	100%	£ 297.7 million
Concept vineyard	Potential	£ 101.2 million	100%	£ 101.2 million
Legume pre-breeding	Potential	£ 47.5 million	60%	£ 28.5 million
TOTAL				**£ 526.9 million**
Research costs				**£ 29.9 million**
Return on Investment per £1 spent at NIAB				**£17.60**

NB. The report also indicated that this return on investment would be even greater had NIAB's international contribution been accounted for.

NIAB 93 Lawrence Weaver Road, Cambridge CB3 0LE • Tel: +44(0)1223 342200 • Email: info@niab.com • niab.com