

# Research & Development Priorities

2014-2015



# Introduction

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British Tomato Growers need high quality pure and applied research to help them to;

- sustain and improve the profitability and competitiveness of their businesses
- optimise inputs, improve quality and yields and reduce waste
- continue adoption of environmentally sensitive and sustainable systems
- differentiate the premium quality of British products for customers and consumers
- meet statutory and customer expectations in every respect

Effective research and knowledge exchange will enable the UK industry to remain at the forefront of global advances in the technologies and practises to ensure sustainability and expansion of British Tomato production. They aim to stay one step ahead of current issues and improve the sustainability of every operation they carry out whether in production, packing, sales or marketing.

The British Tomato Growers Association (BTGA), representing over 90% of the British Tomato industry (approximately 200ha), principally needs to see solutions to the practical problems shared by all growers, using technology which is understood by and acceptable to consumers. The BTGA also wish to encourage novel and speculative research which will drive their long-term innovation agenda. Such solutions include those to the current problems whether in terms of pest and disease, energy, water, environmental sustainability, equipment, labour or any other of a number of issues which have been, are and will continue to be faced in the future.

The whole process requires ongoing development and implementation of best practice from currently available technology and the incorporation of knowledge provided by new research that has been directed by the requirements of the industry. The Association feel it is critical to be involved with research at all levels to ensure outcomes have a direct practical application. The group are keen to engage, partner and participate with research funding bodies to get best value from all streams of research work. Effective knowledge exchange with the whole industry is also a key need. Moreover, the BTGA also hope to encourage young entrants, of all levels, into Tomato production to help assure the sustainability and ongoing vibrancy of this innovative industry.

The current strategy has been developed by the BTGA technical committee consisting of growers, industry experts, consultants, researchers and funding representatives. It is thus believed that the document is an authoritative and well considered text which is commended to members and the

research community at large in the hope that these ideas will stimulate a dialogue between; funding organisations, service providers and the grower community in the UK, to ensure a successful and sustainable future for British based tomato production.

To illustrate the industry needs, the tomato production cycle has been used as a base, with R&D and knowledge transfer requirements highlighted in each phase through production to postharvest. Targets and timeframes have been set; strategies which may help deliver these have been suggested. The BTGA would like to request that stakeholders consult with the technical committee (via their Technical Officer) prior to considering addressing any of the issues presented in this document.

## The BTGA top priorities for 2014-15 are:

- To improve profitability by increased production efficiency through better use of resources
- Maintain and develop preferred supplier status with customers through differentiation of Premium British quality
- To reduce losses caused by pest and diseases using ICM techniques and without recourse to Plant Protection Products wherever possible
- Continue to develop more environmentally sensitive and sustainable systems



## Tomato Crop Cycle



## Seeds and Cultivars

### Targets

- The development of cultivars which require less production inputs e.g. can be grown at lower temperatures, are more efficient at photosynthesising, have a structural architecture that is more favourable for automation and/or labour reduction.
- The development of cultivars which have a higher nutritional value, better flavour and longer shelf-life.
- The development of cultivars which have a wider range of pest, disease and viral resistances to further assist in the overall aim of being a pesticide free industry.
- The development of bespoke UK specific (conventional and organic) cultivars.
- New Product Development.

### Strategies

- Facilitate consultation with seed houses to stimulate interest in TGA Targets in this area.
- Keep up to date with novel plant breeding technologies.
- Form a tomato breeding club and encourage smaller seedhouses to research novel Tomato cultivars.



# Inputs

## Targets

- Maximise the efficient and sustainable use of all crop inputs through setting aspirational targets, measuring our industry achievements and regularly reviewing progress towards those goals.
- Achieving a truly sustainable environmentally friendly and carbon neutral system.
- It should be noted that British growers have, during the last 10 years, made significant progress in all aspects of reducing, re-using, recycling and optimising the use of all crop inputs and achieving efficiency of use with respect to all crop inputs though recognise that as new technologies and systems evolve ongoing progress is still achievable in this respect

## Strategies

- Desk studies to establish best practice and innovation around the world.
- Conduct research to establish if outputs from the desk studies have UK potential.
- Identify parameters which limit fruit quality and investigate methods by which greater control can be exerted, including the aerial and root zone environment.
- Development of new growing systems and techniques to meet the requirements of 21<sup>st</sup> Century crop production requirements.
- **Energy**
  - Continue to investigate alternative and renewable energy streams such as waste heat from other industries.
  - Continue to improve efficient use of energy (glasshouse design and thermal screen technology etc)
  - Gather evidence to support policy and planning regulations to help growers make better use of waste heat.
  - Horizon scan, awareness of and influence ongoing developments in energy Policy where such developments may have a significant impact on our industry.
- **Labour**
  - Develop strategies to improve motivation and participation in our businesses of staff at all levels to ensure we attract the best talent and ensure a sustainable future for the British Tomato industry at this

fundamental level in respect of succession planning and staff retention ensuring horticulture is seen as an attractive and profitable career path.

- Identify appropriate ergonomic solutions to crop husbandry and harvesting activities and develop best practice in these areas.
- Progress options for automation of some tasks.
- **CO<sub>2</sub>**
  - Data mine/model/research ways of reducing CO<sub>2</sub> input with consideration for specific tomato types.
  - Target CO<sub>2</sub> input to more accurately follow plant demand.
  - Develop alternative sources of CO<sub>2</sub> in preparation for fossil fuel free production.
- **Nutrients**
  - Update existing nutrient efficiency and supply models to suit modern Tomato cultivars.
  - Improve understanding of nutrient uptake and research efficient use of nutrients in soil and hydroponic systems.
  - Optimisation of the re-circulation of nutrients in hydroponic systems
- **Water**
  - Investigate methods to reduce water usage without compromising plant health and fruit quality.
  - Develop purification systems for the safe re-use of waste and rain water supplies.
- **Light**
  - Provide technical and economic solutions on supplementary and 'All Year Round' (AYR) lighting technologies.
  - Research applicable new lighting technologies (Plasma, LED's etc) to enable rapid uptake where benefits are economically viable.
- **Substrates**
  - Optimisation of the root zone environment and the relationship between plant and rhizosphere microbial populations.
  - Development of improved and novel substrates.

# Crop protection

## Targets

- To achieve the optimum economic level of pest and disease control through better understanding of the glasshouse ecosystem.
- To ensure the availability of a comprehensive and effective range of natural biological solutions available.
- To reduce the use of non-Biological Plant Protection Products in line with customer expectations..
- To encourage innovation in safe Biological Plant Protection Products development for Tomato production.
- To anticipate where the potential vulnerabilities are and will be in the future regarding the control of existing and novel Pest and Diseases through proactively planning contingency, horizon scan and monitor for new pests and diseases and ensure that products available meet current and future threats.

## Strategies

- Research to improve Integrated Pest Management (IPM) and Integrated Glasshouse Management (IGM) to reduce the economic impact of existing pests and diseases.
- Horizon scan for potential crop protection threats and opportunities through stimulating research where gaps in knowledge exist.
- Develop complimentary contingency plans for potential new threats.

# Cropping systems

## Targets

- To discover and implement the latest developments in labour use, automation and engineering.
- Optimise cropping systems through staff training, motivation and innovation.
- To improve glasshouse and infrastructure design to ensure continuing development and optimisation of cropping systems.
- To improve understanding and optimisation of the aerial environment.
- To improve understanding and optimisation of the rhizosphere.
- To achieve zero production of non-recyclable waste entering air, water, soil or landfill.

## Strategies

- To establish best practice and innovation through engagement with developments in a global context.
- Collate information from researchers and suppliers on improved 'precision management' of cropping systems.
- Improve humidity control efficiency.
- Develop novel growing systems.
- Drive research into glasshouse and packhouse robotics.
- Monitor technical developments in lighting and provide information to inform decisions.
- Provide information on closed irrigation systems and their implementation.
- Monitor and research improved control of fertigation.
- Research work with modellers to improve yield prediction.
- Minimise waste at every stage of production and maximise the use of re-usable, recyclable and renewable inputs.

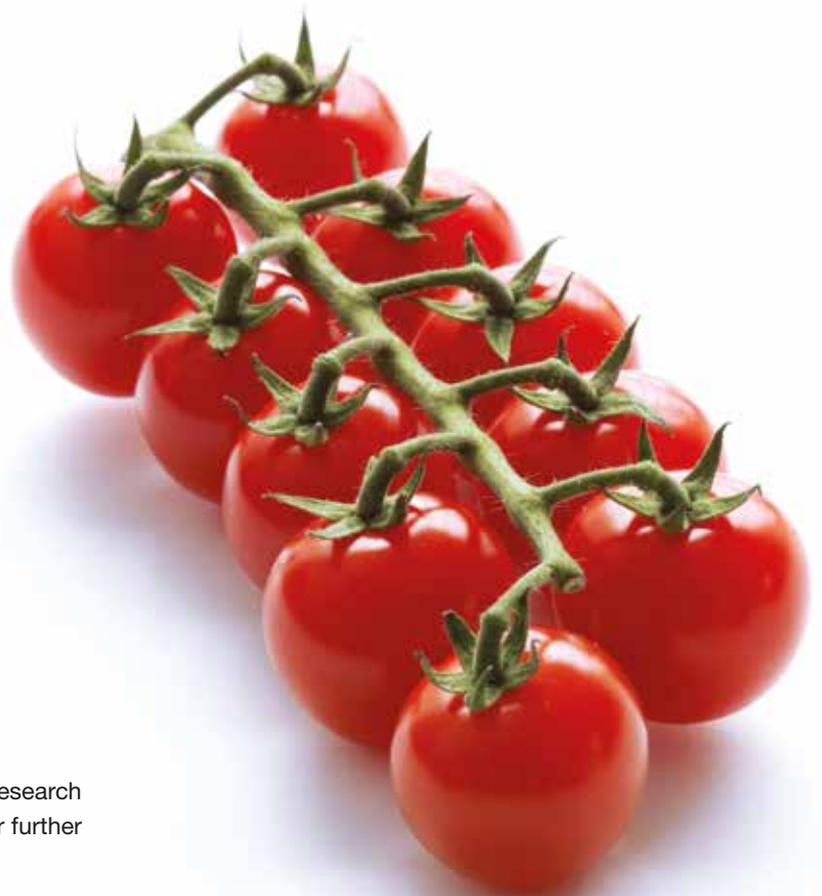
# Post harvest

## Targets

- For consumers to identify British products as being of exceptional flavour and eating quality, of high nutritional value, fresh, safe, wholesome and healthy.
- Improve packing, packaging and storage systems to optimise quality delivered to the consumer
- Improve storage processes and extend product shelf-life.
- Continue to maintain strict microbiological integrity of produce throughout the production process.

## Strategies

- Collate information and suggest research to improve shelf life and fruit quality.
- Innovation in harvesting, transport, storage, packing, packaging and delivery systems to ensure quality and integrity of produce is optimised and never compromised.
- Research ethylene scavengers and novel shelf life extension systems in packhouse and final packaging.
- Produce research data to support and encourage promotion of health benefits of tomato consumption.
- Provide up to date data on constituents of tomato relating to nutritive quality.
- Inform key stakeholders to improve understanding of the British product. Why is British Best?



The TGA Technical Committee will review their Research and Development Strategy on an annual basis. For further information and all enquiries please contact:

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