

Putting together a successful horticulture and potatoes bid for TSB SAFIP funding: *a research perspective and an industry perspective*

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Call and scope

TSB – FOOD PROCESSING AND MANUFACTURING EFFICIENCY June 2012

Specific requirements

- UK food processing and manufacturing sector
- all food and drink groups
- main focus downstream of the 'farm gate'
- may be opportunities for innovation in relevant aspects of primary production
- reducing supply chain waste & efficient recycling
- secure industrial leadership from the food processing, manufacturing, distribution, retail or food service sectors

TSB requirements

- business-led collaborative projects lasting up to 3 years
- deliver innovation and technological advances
- create opportunities for export of goods and services

Identifying industry need/problem and feasible technological solution

- **Brainstorm ideas - be innovative**
- **Discuss with industry (producers, processors, marketers)**
- Define technological solution, business opportunity and market
- Economic appraisal – financial return from new technology
- Identify/quantify risks and risk mitigation

Concepts

- **Bioactive predator refuge to reduce waste in apple and pear production & processing (full proposal successful)**
- **Developing LiDAR to predict and optimise post harvest fruit quality (full proposal successful)**
- **New strategies to disinfest waste soft fruit from alien invasive pests and pathogens (full proposal not successful)**

Identifying industry need/problem and feasible technological solution

- Brainstorm ideas
- Discuss with industry (producers, processors, marketers)
- **Define problem/need, technological solution, business opportunity and market**
- **Economic appraisal – financial return from new technology**
- **Identify/quantify risks and risk mitigation**

The problem



Codling moth

- Zero tolerance in market
- Reason for most insecticides during fruit development
- Perennial problem



Aphids

- Several damaging species affect yield and fruit quality
- Reason for most early season sprays



Pear sucker

- Highly damaging, ruining orchards and severely affecting fruit quality
- Resistant to insecticides
- Out of control in many orchards, but not in others

Identifying underlying cause of the problem



Common European earwig

- **Omnivorous: Voracious nocturnal predator**
- **Where earwigs abundant pear sucker and woolly aphid insignificant, other pests reduced**
- **Large spatial and temporal population variations**
- **Earwigs low or absent in many orchards**
- **Causes of variation unknown, food, shelter, exposure to insecticides important**

Technological solution



Bioactive predator refuge

- Provide shelter during day
- Current bottle refuge provides shelter only, design not optimised and not fit for purpose
- Provide food at key times when populations vulnerable

females foraging for young?

competition for food in summer/autumn?

- Provide aggregation pheromone to ensure rapid occupancy
 - known to exist
 - 33 possible compounds identified in previous research
 - attractive synthetic blend not yet developed



Business and market opportunities

1. **UK biotech manufacturers and agrochem merchants: Manufacture and sell bioactive predator refuge internationally through suppliers/distributors to growers**

Every apple and pear tree will need one!

10% market penetration - worth >£5m/year

2. **POs, growers: Reduce pest losses in yield and quality pre-and post harvest and reduce pesticide use in UK orchards**

50% reduction in pest losses - worth £2.5m/annum to UK industry

enable UK pears to perform as well as UK apples – worth £35m/annum to UK industry

IP protection important

Risks and risk mitigation

Technical risks

1. Physical trap design ineffective
2. Unable to develop suitable effective food
3. Food provision does not affect earwig populations, or does affect not them in a desirable way
4. Unable to identify aggregation pheromone, pheromone too costly to synthesise or provides no benefit in refuge
5. Other overriding earwig mortality factors that cannot be controlled make the refuge ineffective

Commercial risks

1. Similar project undertaken by competitors
2. The bioactive refuge will not be economically viable
3. IP protection not possible, or costs of IP protection through patenting will be too great

Partners - building consortium

- **Identify who is going to benefit**
- **Identify industry lead partner**
- **Build smallest consortium with necessary complimentary skills**
 - research**
 - manufacturer**
 - marketing/selling**
 - users**
- **Industry partners must have capacity to participate in project**

Financial requirements

- **Each partner must participate and have substantive eligible costs in project**
- **Balancing eligible costs**

Was 50:50 industry: research with industry partners getting 10% cash

Now 70:30 industry: research with industry partners getting 60% cash

- **Overall budget must be large enough to engage research partner**
- **Balancing finances is tricky**
- **Industry partners must have good financial administration (e.g. able to calculate overhead rate) - audited**
- **Industry partners must have capacity/willingness to record time spent on project - audited**

Preparing application and workplan

- **Clear mission statement**
- **Visualise end product**
- **Construct business plan**
- **Construct work plan to deliver end product within agreed time period identifying role of each partner**
- **Research partners likely to have to do detailed work to create workplan**

Challenges and rewards

- **Application process is challenging**
- **Partners can be deterred by complexity, levels of contribution, exacting financial requirements, long term commitment**
- **But the rewards can be great**
 - Unlock large amount of research**
 - Motivate and take risks otherwise wouldn't**
 - Develop new technology valuable to business**
 - Leading edge over competitors**
 - New collaborative relationships**
 - Make business more profitable**

Good luck!

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successful projects***