

For BBRO
Secretariat use:

| | |
|---------------|---------|
| BBRO Code | 14/10 |
| Date received | 17-9-13 |

BRITISH BEET RESEARCH ORGANISATION

Holmewood Hall, Church Street, Holme, Peterborough PE7 3BZ
Telephone: 0330 33 555 33 E-mail: jean.maskell@bbro.co.uk

FULL PROJECT PROPOSAL 2014

Please complete all sections of the form as fully as possible; all sections will be considered by evaluators.

1. **Project Title (maximum 15 words)**

To increase the profitability of the UK sugar-beet industry through reductions in soil tare.

2. **Proposer (Leader/Co-ordinator of proposed project)**

| | |
|-----------------------|----------------------------------|
| Project Leader's Name | Colin Walters |
| Position Held | Agricultural Development Manager |
| Tel. No. | 07850 369850 |
| Fax No. | |
| e-mail | |

3. **Lead Institute**

| | |
|----------------------------------|------|
| Name and Address of Organisation | BBRO |
|----------------------------------|------|

4. **Collaboration (where applicable)**

| | |
|---|--|
| Joint contractor(s) name(s) and address(es) | |
|---|--|

5. **Summary of annual and total costs**

Include at:- (a) All costs excluding VAT to be funded by the BBRO.

(b) VAT on costs at a) to be funded by the BBRO

(c) The value of all work or in-kind' contributions funded by other bodies.

| Funding bodies | 2014/15 | 2015/16 | 2016/17 | 2017/18 | Total (£) |
|----------------------------------|---------|---------|---------|---------|-----------|
| a) BBRO Cost (excluding VAT) | 22059 | 22059 | 22059 | 22059 | |
| b) VAT at 20% | 4412 | 4412 | 4412 | 4412 | |
| c) Others see item 9 | | | | | |
| TOTAL COSTS including VAT | 26471 | 26471 | 26471 | 26471 | |

6. **DURATION AND START DATE**

| | | | |
|------------------------------|-----------|---------------------|------------|
| Proposed duration in months: | 48 months | Proposed start date | April 2014 |
|------------------------------|-----------|---------------------|------------|

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7. **Estimated total costs requested from BBRO - See notes at APPENDIX 2**
(Separate table for each contractor). Name of Contractor:

| | 2014/15 £ | 2015/16 £ | 2016/17 £ | 2017/18 £ | Total £ |
|----------------------------|--------------|--------------|--------------|--------------|------------|
| Pay costs | 8112 | 8112 | 8112 | 8112 | |
| Salary | | | | | |
| National Insurance | 2028 | 2028 | 2028 | 2028 | |
| Superannuation | 2839 | 2839 | 2839 | 2839 | |
| Total | 12980 | 12980 | 12980 | 12980 | |
| Consumables (specify): | 2023 | 2023 | 2023 | 2023 | |
| Inputs | | | | | |
| Operations | 7056 | 7056 | 7056 | 7056 | |
| Sub-Total | 22059 | 22059 | 22059 | 22059 | |
| VAT | 4412 | 4412 | 4412 | 4412 | |
| TOTAL PROJECT COSTS | 26471 | 26471 | 26471 | 26471 | |

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8. Collaborative Schemes

Is this work being submitted to another funder or to a collaborative scheme such as LINK, TSB?
(tick box)

Yes No

If Yes, please specify name of other funder/collaboration scheme (below)

| | |
|--|-------------------------|
| | Date decision expected: |
|--|-------------------------|

9. Other funds (see item 5) related to this and other sugar beet projects

(a) Summarise funding agreed or applied for from sources other than BBRO for this work. (Please attach letters giving agreement to any collaboration.):

None

(b) 'In kind' contributions (excluding those valued in cash terms in Section 5):

None

(c) Summary of funding for other sugar beet R & D being carried out by proposer (and/or collaborators) from sources other than BBRO:

None

10. Abstract of proposed work. (NB may be published as a press release). Include main objective and nature of collaboration with (named) joint contractors (maximum 400 words)

Large quantities of soil adhering to beet are delivered to factories during the campaign at considerable cost to the industry in transportation, removal and disposal. Improvements in the design and operation of harvesters and cleaner-loaders that allow better removal of the soil on-farm have mitigated this to some extent. Even so, soil tares in recent campaigns have amounted to around 350,000 tonnes (or the equivalent of 11,000 lorry loads) of soil delivered to British Sugar's factories each year at a cost in excess c. £2.5million to the industry.

The project seeks to determine whether soil tares can be decreased further by changing on-farm storage practices to increase the rate of drying of the soil on lifted beet, thus making more of it removable prior to delivery. The questions it seeks to resolve are: would 3-5 days of storage under more rapid drying conditions - instead of immediate, 'just-in-time' delivery - allow more soil to be left on-farm rather than transported to the factory? What shape of store and length of time is needed to achieve this? Does store covering help the drying process? And will a reduction in the costs of soil transport and disposal outweigh the potential storage losses of sugar?

11. Purpose and Justification, plus Benefit to Grower

Within the appropriate scientific or technical context, concisely summarise the problem which you propose to address and its current or longer term importance to the sugar industry and BBRO. Also give details of the expected benefits to the grower.

Purpose: Large quantities of soil adhering to beet are delivered to factories during the campaign at considerable cost to the industry in transportation, removal and disposal. They are mainly influenced by soil type and the weather at harvest, and have been mitigated to some extent by improvements in the

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design and operation of harvesters and cleaner-loaders that allow better removal of the soil on-farm. Even so, the amounts of soil delivered are still considerable. The new work proposed here seeks to determine whether these soil tares can be further decreased by changes to on-farm storage practices aimed at increasing the rate of drying of the soil on lifted beet and making it easier to remove more of it prior to delivery. The questions it seeks to resolve are: would 3-5 days of storage in more rapidly drying piles, instead of immediate, 'just-in-time' delivery allow more soil to be left on-farm rather than transported to the factory? To what extent does the form of the store influence drying rate – are shallow, A-shaped Maus-type stores or irregularly-heaped piles better in this respect than conventional rectangular clamps? How do different clamp coverings influence drying? (Recent continental studies, for instance, have shown that prolonged covering of clamps improves soil drying and cleaner/loader efficiency by over 20%). Does the scale of any reduction in the cost of transporting and disposing of soil outweigh the potential loss of sugar?

Justification and cost to the industry: Around 350,000 tonnes of soil are delivered to British Sugar's factories each year, with the amounts varying considerably between contracts, delivery dates and seasons. This is equivalent to c. 11,000 lorry loads of soil being removed from farms transported over an average of 26 miles, at an average cost to the grower side of the industry of £1.67m. Handling and disposing of the soil from the factories carries a further net cost to the processor.

Key references:

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12. Objectives.

Please give a concise statement of: (a) each of the scientific technical objectives of the project, (b) the extent to which these objectives are interdependent, (c) possible factors likely to delay the achievement of the objectives, (d) the necessity for further research/development.

- a. **Objectives** (technical and scientific aims of the proposal which must be **measurable and timebound**). (Please number the objectives so they will clearly cross-refer to entries in the Approaches and Milestones sections).

Objective. To determine the effects of the form of beet store, the period of storage, and different clamp coverings on the drying of soil adhering to lifted beet and the ease of its removal on farm.

- b. **Interdependence of objectives.** (To what extent does the success of one objective depend on the successful completion of another?) (How essential is each objective in achieving the overall objective?).

- c. **Please give details of any particular factors which might cause delays in the achievement of these objectives.** Include steps you will take to minimise the occurrence or effect of such delays.

Soil type and the weather at harvest will have major effects on soil tare. These will be taken into account by having four experiments on different soils each year, repeated for four years.

- d. What if any, further research/development would be needed before the results of this project can be utilised fully?

If early results are encouraging, an early promulgation guidance to growers is possible prior to the eventual completion of the project.

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13. Approaches. Detail the experimental approaches to be used in realising the objectives and set out the work plan for the life of the project, stating clearly how you intend to proceed. **Where there is more than one contractor, please distinguish clearly between the roles of each.**

Beet storage experiments will be established each year at four sites of different soil type (sandy loam, clay loam, silt and organic) for a period of four years. Three forms of store will be built: conventional rectangular clamps, A-shaped clamps suited to Maus-type cleaner/loaders, or small, heaped piles in which freshly-lifted beet will be stored for periods of 1, 2 or 3 weeks. Different coverings will be used to protect different sections of the clamps (or separate groups of piles). The effects of these treatments on the rate at which the soil adhering to the lifted beet dries and the ease with which it can be removed on farm, and any losses of sugar will be measured by taking factory-bucket samples of beet from various locations within each covered section of each form of store at the end of each storage period. These will be passed over a potato riddle (to simulate a cleaner/loader) and their clean weights, dirt tares and sugar contents measured in the Wisington factory tare-house. Similar samples of freshly-lifted and similarly-processed beet will be taken for comparison.

14. Milestones.

Based on your research plan please give milestones (i.e points at which progress can be assessed) with target dates for monitoring progress towards achievement of the scientific/technical objectives. Each milestone should relate to one objective, i.e. the milestones for objective 1 should be numbered 01/01, 01/02, etc.

| Objective No. Milestone No. | Target date | Description |
|--------------------------------|--------------------|---|
| 01/01 | End September 2014 | To have identified the 1 st -year's four experimental sites. |
| 01/02 | Mid October 2014 | To have established the four trials and completed measurements on freshly-lifted beet. |
| 01/03 | End November 2014 | To have completed measurements on stored beet. |
| 01/04 | End January 2015 | To have completed data analysis and produced the annual report on the 1 st -year's experiment. |
| 01/05 | End September 2015 | To have identified the 2 nd -year's four experimental sites. |
| 01/06 | Mid October 2015 | To have established the four trials and completed measurements on freshly-lifted beet. |
| 01/07 | End November 2015 | To have completed measurements on stored beet. |
| 01/08 | End January 2016 | To have completed data analysis and produced an interim report on the 2 nd -year's experiment. |
| 01/09 | Spring 2016 | To have produced an interim report on the 2-years' experiments and an introductory article for the <i>British Sugar Beet Review</i> |
| 01/10 | End September 2016 | To have identified the 3 rd -year's four experimental sites. |
| 01/11 | Mid October 2016 | To have established the four trials and completed measurements on freshly-lifted beet. |
| 01/12 | End November 2016 | To have completed measurements on stored beet. |
| 01/13 | End January 2017 | To have completed data analysis and produced the annual report on the 3 rd -year's experiment. |
| 01/14 | End September 2017 | To have identified the 4 th -year's four experimental sites. |
| 01/15 | Mid October 2017 | To have established the four trials and completed measurements on freshly-lifted beet. |
| 01/16 | End November 2017 | To have completed measurements on stored beet. |
| 01/17 | End January 2018 | To have completed data analysis of the 4 th -year's experiment. |
| 01/18 | Spring 2018 | To have produced the final report for the project and an advisory article for the <i>British Sugar Beet Review</i> . |

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15. Staff Effort
(New key staff applying for BBRO funding should also complete APPENDIX 1)

Please list the number of days input from all staff who will work on the project including the project leader(s) and all vacancies to be recruited for this project.

| Name | Organisation | Grade | Year 1 | Year 2 | Year 3 | Year 4 | Total time |
|-------|--------------|-------|--------|--------|--------|--------|------------|
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| | | | | | | | |
| | | | | | | | |
| TOTAL | | | | | | | |

Please state how many staff days equals one staff year.

| Institution | Days |
|-------------|------|
| | |

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16. Quality Assurance – new applicants and/or collaborators only. Please state what procedures you and, if applicable, your collaborators operate for quality assurance.

17. Technology Transfer

(a) The route to exploitation of the results arising from the project should be considered at the outset. Please indicate the mechanisms by which the output from the project will be taken up by the industry. Attach letters of consent from any third parties essential to exploitation of the results of the project.

The results of this work will inform the growth model and be promulgated via the usual BBRO technology transfer channels.

(b) Successful applicants will be expected to present appropriate aspects of their work at educational events organised by BBRO and others (e.g. BBRO Growers' Meetings; Cereals). Please list anticipated numbers and, if possible, expected dates of submission of e.g. publication in refereed journals, trade journals and the press; presentations or demonstrations to the scientific community or trade organisations and internal reports or publications.

Note: In any publications including, press articles YOU MUST acknowledge the financial support for the BBRO.

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18. Benefits

a) Please describe and quantify the benefits which may arise from this project and how, when and by whom the benefits may be expected to be realised.

See section 11 of this form.

b) Is the project likely to lead to patentable or otherwise commercially exploitable results?

Yes No

If 'YES', please give details

19. Referees (applicants should be aware that their application may be submitted to external referees considered appropriate by BBRO for comment).

Please note that members of the BBRO or experts in your own institute MUST NOT be nominated as referees.

a) You may suggest up to 3 external scientific referee(s) below:

Names/address/telephone number of

b) If necessary indicate those referees to whom you would prefer that your application should **NOT** be sent.

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DECLARATION (Please see APPENDIX 3)

I confirm that I have read this application and that the work, if funded, will be accommodated and administered in the department/institution/organisation in accordance with BBRO's contractual arrangements. The staff gradings and salaries quoted are correct and in accordance with the normal practice of this institution or organisation.

(a) Head of Department

Signature Date

Name and initials in BLOCK LETTERS Institution/organisation

(b) Administrative Authority

Signature Date

Name and initials in BLOCK LETTERS Position (e.g Finance Officer, Bursar/Registrar/Secretary of Institution or Organisation)

Institution/Organisation Full postal address and postcode

Telephone No. Including STD Code

(c) Project Leader

Signature Date

Name and initials in BLOCK LETTERS Institution/organisation

Full postal address and postcode Telephone No. Including STD Code

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APPENDIX 1: New applicants for BBRO funding

| i) <u>Name</u> | | | |
|--|--------------------------------|-------------------------|-------------|
| ii) <u>Education</u> | | | |
| <i>Qualification(s)</i> | <i>University or Institute</i> | <i>Scientific Field</i> | <i>Year</i> |
| | | | |
| | | | |
| | | | |
| | | | |
| iii) <u>Research Training (Post-doctoral/Post-graduation)</u> | | | |
| Dates | Institution | Department | Supervisor |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| iv) <u>Career History</u> | | | |
| Dates | Institution | Department | Position |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Publications: List the five most recent relevant publications in accredited journals. You may also state the total number of your:- a) refereed papers, b) popular articles, c) other publications.

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APPENDIX 2: FINANCE

Financial Guidance Notes

BBRO has a flexible and firm approach to costing. Costs will be considered if appropriate to the objectives of the project. All costs should be included under the appropriate headings below; non-specific overhead charges cannot be considered. Please ensure, particularly under 'Other costs', that you are not double counting any expenditure or inadvertently including VAT on purchases and sub-contracts.

Pay costs

You should include the costs of all staff who will be working directly on the project, including casuals, students, and staff to be recruited. Your totals here must be in accord with the detailed breakdown at item 15 showing:

(i) the number of days contributed in each year of the project. (Please give an explanation where the staff effort varies during the life of the project);

(ii) proportionate annual salary during each year of the project, including London (or other town) weighting allowances, employer's NI, and superannuation;

In some cases (eg for certain public sector employers) the BBRO is willing to accept pay calculations on the basis of average annual salary, NI and superannuation costs. In this event you should indicate the average salary, NI, and superannuation used for the grade(s) in question.

Consumables

Include here such things as seed and specialist laboratory chemicals which will be bought specifically for this project and which are not covered elsewhere in your costings.

Please list separately all consumables you will use including, if possible, quantities.

Capital Equipment

We would not expect to pay for equipment. We expect research bodies to be equipped to carry out the work they propose, and to include appropriate charges for equipment use in their costings.

In very exceptional circumstances, where you would not be able to do the proposed work without buying specialised equipment costing over £2,000, we will consider grant-aid to a maximum of one-fifth of the purchase price for each year that the equipment is used solely on the project. Where new equipment is required, please give details of its make, model, price, purpose, why it is essential for the work, and why it is essential that you buy it. Include the appropriate proportion of the price under the intended year of purchase.

You may be asked by the BBRO to provide the following for inspection:

(i) the original written quotations obtained from three different suppliers;

(ii) the original purchasing invoice.

Travel

Where travel costs are necessary, please give details of their frequency, purpose, destination, the mileage and rate per mile (for road travel), air/rail fares, class of travel, and number of persons travelling, plus any inflation factors that have been included. If itemised in the proposal, visits to conferences and similar functions in the UK or elsewhere will be funded where you can demonstrate to our satisfaction that the visits are essential to the project. A report will be required from anyone funded either directly or indirectly (ie as part of a project) by BBRO to attend a congress or symposium.

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Appendix 2 continued
Central and Departmental Costs

These are direct costs that underpin the research activities and indirect costs which cannot readily be uniquely assigned to the particular projects which are the subject of this proposal. These may include the following:

- financial services (finance, accounting, tendering, marketing);
- personnel services;
- staff facilities (transport, health and safety, training and conferences, IIRB subscription, welfare, laundry);
- departmental services (administration, library, secretarial, printing, minor stores items, general equipment, and laboratory and workshop support);
- staff management and cover for maternity and long-term sickness benefits.

Consultancy and sub-contracts

Please detail separately the component parts of any consultancy or sub-contract, including salary costs, NI, superannuation, consumables, equipment, travel, central and other costs.

You should show that the costs under this heading are essential to the success of the project, and that it would not be possible (or would not be cost-effective) to provide the expertise within your establishment, or within your collaborative group if appropriate.

You will be responsible for paying consultants or sub-contractors for their work.

Other costs

You should include here items which can be identified with the project but which do not readily fit under any of the other headings provided. Depending on the nature of the work and how your establishment calculates its central costs, these might include: laboratory/analytical services, servicing of equipment, non-equipment rental charges, recruitment costs, computer software, stationery items, student registration fees and glasshouse heating.

You should provide a short explanation of the need for all the items you list here.

VAT

If you are VAT registered, VAT should be charged at standard rate whether or not you are an eligible body, and shown separately in the box provided.

Ineligible costs

The following costs are not eligible:

- interest charges;
- hire purchase interest and any associated service charges;
- profit earned by a subsidiary or by an associated undertaking on work sub-contracted under the project; and
- inflation and contingency allowances expressed as an arbitrary percentage overall addition

Justification of overheads and other resources required

Please explain the method(s) used to calculate the central and departmental costs listed at item 7. Also justify the funding requested under the cost headings: consumables, capital equipment, travel expenses and other costs and include any special justification for particular grades of staff to be employed on the project.

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APPENDIX 3: DECLARATION

Contractual Authority

This application should be submitted by/through:

- the Head of Department
- the officer who will be responsible for administering any funds that may be awarded
- Project Leader.

The project leader is the person who will be directly responsible for co-ordination of the proposed research, for submitting annual progress reports and for bringing the project to a successful conclusion with a comprehensive final report.

Any proposed change in the project leader must be notified to the BBRO Secretariat immediately. In some cases, funding may be conditional on a particular person acting as project leader. If you change project leader we might want to review progress before funding the next year's work.

Funding is for a maximum of four years at a time, paid quarterly in arrears, subject to satisfactory annual progress reports. You *must* inform us of any changes or delays to the starting date.

If your proposed work would take more than four years to complete you will have to apply again for a renewal of the funding. As the availability of renewed funding cannot be assured, it would be prudent to design work so that if necessary you could bring it to an orderly conclusion after four years.

You should write the abstract explaining in layman's terms the purpose and the value of the proposed project.

Include casuals and students, and identify any vacancies to be filled.

As projects are funded by a levy on industry, we need to make sure that the industry will see the outcome of your work. Please tell us what additional measures you plan to encourage technology transfer and uptake by industry.

The BBRO is aware that funding from other sources may be conditional on confidentiality. In such cases it will normally be content with information about the source in generic terms (eg "seed company").

Please also give a timescale for likely uptake by industry.

Where funding is requested and awarded for a specific period, it is agreed that annual reports specifying progress and a final report will be submitted in accordance with the terms and conditions of the contract under which the project is scheduled.