

Mylnefield Research Services

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MRS, the commercial wholly-owned subsidiary of the Scottish Crop Research Institute (SCRI), was established in 1989 to enhance competitiveness, understand and fulfil the needs of industry. The company has grown steadily and continued to benefit SCRI through Gift Aid and the provision of services, without any external financial assistance.

The Mission Statement of MRS is:

To develop commercially the Scottish Crop Research Institute's scientific expertise, resources and intellectual property, and to improve the quality of services to achieve new standards of excellence.

MRS has an option on all intellectual property (IP) generated at SCRI and has access to a unique range of scientific expertise, laboratory, glasshouse and field facilities and germplasm collections. Particular areas of strength include plant pathology, molecular biology, plant genetics and breeding, soil and environmental sciences, in addition to chemistry, biomathematics and statistics. MRS uses a variety of routes to generate income from IP and expertise, including licensing, contract research and the sale of products and services. The profit made on these transactions is gifted back to SCRI either directly or indirectly through the Mylnefield Trust. During the last four financial years MRS has gifted in excess of £1 million to SCRI and its affiliated charitable trust, the Mylnefield Trust.

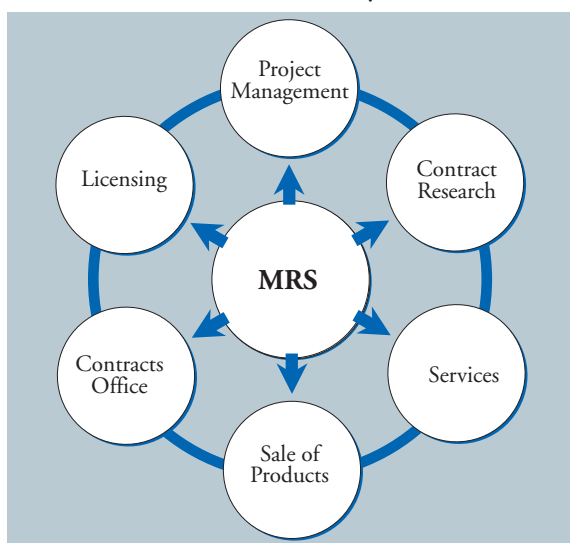


Figure 1 The business activities of MRS.

The business activities of MRS are diverse (see Fig.1) and its major sources of income (2003-2004) are:-

Contract research (68%) - In the financial year 2003/2004 MRS signed a total of 19 contracts with a total value of £1,435,227.

Royalties and licence fees derived from commercialising IP (15%)

Analytical services and consultancy (10%)

Sale of products (7%)

In recent years, the proportion of income from contract research has fallen from approximately 90% of turnover to approximately 70% and this is a reflection of the turbulent agricultural and "ag-biotech" markets that have been discussed in previous annual reports.

Finances The income of MRS increased slightly to £1.67 million in 2003/2004. However, charitable donations increased significantly, totalling £185k (£115k to SCRI and £70k to the Mylnefield Trust) in 2003/2004 as compared to a total of £145k in 2002/2003 and were greatly in excess of budget.

The Lipid Unit is ISO9001-accredited and is operating to GLP standards. There was significant growth in lipid analysis business in 2003/2004 and MRS continues to explore new avenues of business for this unit. Two successful training courses were held in 2003/2004 on lipid chemistry and analysis. The Lipid Analysis Unit turnover was in excess of £204k in 2003/2004.

MRS aims to receive annual royalty income from its plant varieties and inventions of at least £180k, this was exceeded in 2003/2004 with an income of £226k.

Licensing and IP Asset Management MRS is responsible for ensuring that all varieties emanating from breeding programmes at SCRI are protected by plant variety rights, drawing up license agreements with third parties and collecting the royalties due. In 2003, MRS decided not to renew the subcontract it had with a third party for the commercialisation of the Glen Ample, Glen Lyon and other raspberry varieties and these are now commercialised directly by MRS. One of the challenges MRS faces for these varieties is the collection of royalty income from territories such as Spain. To facilitate this MRS appointed Eurosemillas as head licensee for Spain. Eurosemillas has gained

expertise in this market through the licensing of the University of California strawberries in Spain.

One of the strategies in the current MRS business plan was to investigate the feasibility of licensing IP from other organisations on their behalf. Investigation showed that this would maximise benefit from MRS's in-house expertise and led to MRS successfully tendering in 2004 for the position of Programme Agent to the English Raspberry Breeding Programme housed at East Malling Research.

MRS licences potatoes, forage and salad rape, turnip, kale, blackcurrants, blackberry, raspberry and strawberry varieties and currently has a portfolio of around 450 licences.

In the financial year 2003/2004, two potato varieties and two swede varieties were entered into National List trials, and three potato varieties were granted European Plant Variety Rights (Inca Sun, Tay and Mayan Gold).

Raspberry Breeding The raspberry breeding programme signed in 2003 and funded by the Horticultural Development Council, the Scottish Executive, the Scottish Society for Crop Research, and a consortium of all major companies involved in the raspberry industry in the UK is progressing well and it is expected that EU Plant Variety Rights will be sought in 2005 for at least 2 new raspberry cultivars.

LINK Programmes MRS, together with SCRI, are involved in two new LINK projects. The first (Drs. Bryan, Bradshaw and Griffiths) is investigating the genetic and chemical basis of potato flavour, especially looking at flavour profiles of SCRI-bred phureja varieties. Eventually, it is hoped that new potato varieties with improved, and a wider range of, flavours could be bred. The second project (Dr Graham) builds on previous work at SCRI to develop the first genetic linkage map of raspberry and aims to develop a molecular marker for raspberry root rot. This marker could be utilised in the SCRI raspberry breeding programme (see above) and lead to the release of new cultivars with resistance to this economically devastating disease. Together these two programmes will enable SCRI potato and raspberry breeding programmes to remain at the forefront of international plant breeding.

Developing Markets In order to consolidate our business and recognise the increasing competition in the fields of contract research and licensing MRS has started to develop new markets for our products and

services. Details of some of our activities are highlighted below:

CHINA is the biggest producer of potatoes in the world by area (24% in 2004; ~4.6m ha of harvested crop). Between 1990 and 2004 potato production more than doubled from 32m to 75m tonnes. However, yields are substantially lower, as compared to UK, at an average of 16.3 tonnes per ha. China is the second largest potato seed market. However, the UK is currently not allowed to export its high quality seed potatoes into China because of a ban imposed by the Chinese government. The China Britain Business Council (CBBC) organised a trade mission to China in 2002. MRS together with colleagues from the British Potato Council (BPC), CBBC and Defra



Professor J. Hillman and Dr. N. Kerby at the World Potato Congress in Kunming.

played an active part in the initial negotiations to develop an inter-government agreement between the UK and China on plant health. Defra Secretary of State, Margaret Beckett, and the Chinese Minister of Agriculture, Du Quinglin, signed the agreement on 15 June 2004 and this is the first step to lift the ban on UK potato exports to China. The next step is for the General Administration for Quality Supervision, Inspection and Quarantine (AQSIQ) to conduct a "pest risk analysis" based on information supplied by UK authorities. SCRI hosted a visit of a senior AQSIQ delegation during summer 2004 and we currently await the finalised regulations. The UK seed industry will have a significant opportunity when the ban is eventually lifted since the UK has some of the highest potato seed standards in the world and Scotland is free from brown rot and ring rot. Our first joint venture, Scottish Potato Technology (SPT) Ltd, should be well placed to exploit this market and we hope to see SCRI varieties exported to China where protection of IP has been sought for a SPT controlled cultivar.

China hosted the World Potato Congress (WPC) in March 2004 in Kunming, Yunnan Province and Nigel Kerby gave one of the plenary lectures. SCRI, MRS and SPT exhibited on the British stand organised by the British Potato Council. At the WPC a Memorandum of Understanding in the field of collaborative potato research between SCRI and the International Potato Centre (CIP) was signed. Additional work in China included setting up of trial sites in China for blackcurrant varieties (Ben Tirran, Ben Hope and Ben Alder) and recently an Agreement has been signed with the Agricultural University of Jilin for further agronomic evaluation of these varieties.

INDIA SCRI hosted the visit of Dr Paul Khurana, the Director of CPRI Shimla, and Dr M Rai (Director General, Indian Council of Agricultural Research) in August 2003. Following on from this visit, a Memorandum of Understanding for collaboration in potato research is being negotiated, and scientific exchanges have been planned.

EASTERN EUROPE The enlargement of the EU on 1st May 2004 to include the Baltic States, Czech and Slovak Republics, Hungary, Poland, Slovenia, Malta and Cyprus has made it easier for MRS to develop this large and expanding market. In advance of this historical event, MRS had already licensed blackcurrant varieties in Poland, the Czech Republic and Slovak Republic. The blackberry variety, Loch Ness, is licensed to be grown in Hungary and sold throughout Eastern Europe, including the Baltic States, Poland and Slovenia. Symphony, the popular SCRI strawberry, is being grown commercially in the Czech Republic and Hungary. MRS has established collaborations with key research institutes in Romania, a candidate country for entry to the EU. In addition to a number of consultancies looking at the potential for organic agriculture in Transylvania, SCRI-bred varieties of potato and soft fruit are being trialled with a view to establishing commercial production in the near future.

Scottish Potato Technology During 2003, MRS was instrumental in the incorporation of a new joint venture (JV) Scottish Potato Technology Ltd (SPT). SPT is a consortium of leading companies in the Scottish potato industry, which will commercialise collectively their extensive potato expertise, products and services in overseas markets, with an initial emphasis on China. The JV partners are Cygnet PB, Greenvale AP, Higgins G&I Ltd, Mylnefield Holdings Ltd (on behalf of SCRI and MRS), Reekie

Manufacturing Ltd and Scottish Agricultural Science Agency.

Products and services include:

- Sale of high grade seed
- Micro-propagation
- New varieties and plant breeding
- Machinery (field and grading)
- Storage systems
- Advisory and consultancy services
- Disease diagnostics
- Seed certification
- Agronomy
- Technology
- Contract and collaborative research

The benefits to the SCRI Group include: developing a new market for our varieties, products and services; increasing royalty income in new, developing markets; improving networking both within and outwith the UK; attracting contract research aimed at specific markets and environments

Human Resources MRS values highly the skills and experience of all its employees and recognises their contribution, together with that of SCRI scientific and administrative staff, to company performance. MRS is committed to investing in training to ensure that all employees not only perform effectively and efficiently, but also gain long-term satisfaction from their work. Dr Jonathan Snape formerly the Commercial Manager of MRS was appointed as Commercial Director. Ms Lynne Ferguson was appointed in September 2003 as an Assistant Raspberry Breeder and also Mr Lee Hunter was appointed as an Analytical Chemist within the Lipid Unit. MRS retained the IIP Standard in November 2003.

Knowledge Transfer and Exploitation (KTE) has been central to the vision and strategy of SCRI and MRS to meet end-user needs. The KTE strategy at SCRI is continually evolving in response to Policy and end-user needs.

The routes and mechanisms of KTE are extensive and are outlined in Fig. 2.

The extent of Industrial and Commercial interactions is given below:

- 75 active commercial customers
- >550 customers since 1997

MRS Lipid Unit provides analytical services to over 50 active clients in the pharmaceutical, food, agricultural, marine and chemical industries

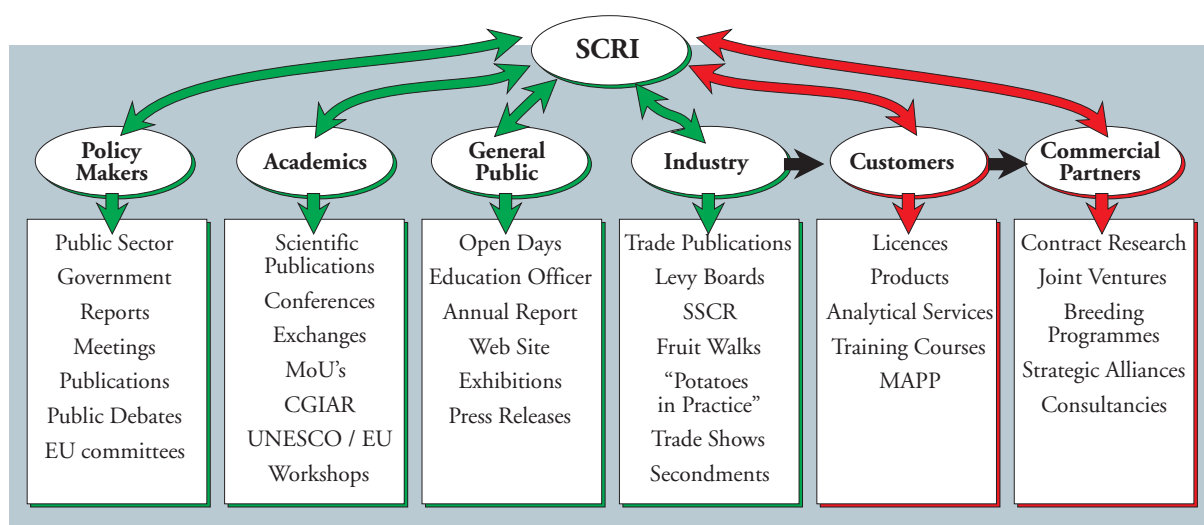


Figure 2 Knowledge transfer and exploitation. Commercial(), Non-commercial()

16 new companies visited SCRI in 2004

Over 450 licences

Acknowledgements MRS gratefully acknowledges the support of all SCRI staff, for their significant contribution to the success of the company. MRS would also like to thank its customers and sponsors for their continued support.

Mylnefield Trust and Mylnefield Holdings Ltd. (MHL) were established in 2000 in order to give the SCRI Group the flexibility it requires to grow. Central to this growth is the creation of a number of spin-out companies, such as Scottish Potato Technology Ltd, that MHL on behalf of the SCRI Group will hold equity.

The Trustees are a group of individuals, including several members of the MRS Board of Directors and the SCRI Governing Body. The Trust currently has funds of approximately £300K, achieved mainly through donations from MRS Ltd.

The Trust has charitable status and has as its prime objectives:

to promote research and scientific work in the life, environmental and related sciences, in particular produc-

tion of agricultural, horticultural and forestry crops, methods of limiting or eradicating pests and diseases, wood sciences and biomathematics, methods of increasing production or growth, improving cultivation and research into possible varieties.

to promote the dissemination of such research

To date the Trust has funded:

An Incentive Fund to provide further support for scientists actively winning external contracts to pursue scientific research

Funds to support the establishment of an Education Officer at SCRI

A hardship fund for an overseas student

Start-up funding for the Product Innovation Centre

Early in 2004 the Mylnefield Trust invited SCRI scientists to apply for funding to support scientific research and its dissemination. A total of 6 proposals were supported and details of the awards are given below:

The Trustees hope that this scheme will become an annual event.

Name	Title	Value
Gordon Simpson	Rapid Mapping of Novel <i>Arabidopsis</i> Flowering Time Mutants	£1,019
Leighton Pritchard, Ian Toth & Paul Birch	Extension of the <i>Erwinia</i> Genome Sequence Web site (Eca WEB) by the Development of a Novel Genome-Viewing Software Package (GenomeDiagram)	£5,200
David Marshall, Linda Cardle & Paul Shaw	Development and Curation of Domain Specific Databases for Plant snoRNA, Protein Localisation and Nucleolar Proteins	£2,000
Sharon Neilson	DNA Workshops	£2,990
Sharon Neilson	The Living Field Project	£7,500
Hugh Barker, Bruce Marshall and Alison Dolan	Development of an Interactive Web Tool for Providing Information from the Soft Fruit Pathogen Testing Programme	£2,640