



James Hutton Ltd

International Potato Projects

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The James
Hutton
Institute

Benefits of International Projects

- Opening up new markets for Scottish seed exports
- Generating income for JHI to invest in more potato research
- Access to new germplasm, new technologies and innovations
- International development and food security



Global Potato Production (2016)

	Area	Area (%)	Production	Production (%)	Average Yield
1 China	5815140	30.2	99122420	26.3	17.0
2 India	2130000	11.1	43770000	11.6	20.5
3 Russia	2030858	10.6	31107797	8.3	15.3
4 Ukraine	1311600	6.8	21750290	5.8	16.6
5 Bangladesh	475699	2.5	9474099	2.5	19.9
6 USA	407810	2.1	19990950	5.3	49.0
7 Canada	342409	1.8	4324110	1.1	12.6
8 Nigeria	333100	1.7	1246380	0.3	3.7
9 Poland	311620	1.6	8872445	2.4	28.5
10 Peru	310698	1.6	4400295	1.2	14.2
11 Belarus	292401	1.5	5985810	1.6	20.5
12 Germany	242500	1.3	10772100	2.9	44.4
13 Nepal	199971	1.0	2805582	0.7	14.0
14 Tanzania	186905	1.0	1499508	0.4	8.0
15 Kazakhstan	186242	1.0	3545695	0.9	19.0
16 Romania	186233	1.0	2689733	0.7	14.4
17 Egypt	184592	1.0	5029022	1.3	27.2
18 Bolivia	181708	0.9	1073744	0.3	5.9
19 Pakistan	178223	0.9	4000361	1.1	22.4
20 France	175225	0.9	6834680	1.8	39.0
21 Iran	161771	0.8	5164891	1.4	31.9
22 Algeria	156196	0.8	4782690	1.3	30.6
23 Netherlands	155594	0.8	6534338	1.7	42.0
24 Kenya	145967	0.8	1335883	0.4	9.2
25 Turkey	144706	0.8	4750000	1.3	32.8
26 South Korea	140168	0.7	631596	0.2	26.3
27 UK	139000	0.7	6534338	1.7	38.7
28 Brazil	129842	0.7	3851396	1.0	29.7
29 Angola	122465	0.6	721476	0.2	5.9
30 Colombia	121920	0.6	2354862	0.6	19.3



China: Academic Collaborations

- MoUs with 9 Chinese organisations
 - Huazhong Agricultural University (HAU), Wuhan
 - China Agricultural University (CAS-CAU)
 - CAU Centre for Resources, Environment and Food Security (CREFS)
 - Chinese Academy of Sciences (CAS), Research Centre for Eco-Environmental Sciences (RCES)
 - The Chinese Academy of Agricultural Sciences (CAAS)
 - Zhejiang Academy of Agricultural Sciences (ZAAS)
 - Heilongjiang Academy of Agricultural Sciences (HAAS), Harbin, Heilongjiang
 - Northwest A&F University (NWAUFU)
 - Sechuan Academy of Agricultural Sciences (SAAS)
- Examples of Projects
 - Potato disease resistance gene mapping and cloning (Wuhan)
 - Potato cultivar assessment for resistances (CAAS)
 - Potato breeding tools (Kunming)
 - Effector-based breeding (Harbin)



China: Commercial Collaborations

■ Xisen Potato

- Largest seed potato company in China
- Capacity to produce 400 million minitubers / year
- Manufacture a range of potato products (bread, juice, dumplings)



■ PhageLux

- Manufacturer of phage for crop protection applications
- Newton Fund Proposal submitted



China: Germplasm Trials

- 20 varieties sent for trialling in 2012
- Sulan-1 identified as having commercial potential
 - 3 years of commercial trials
 - 100,000 tubers trialled in 2017
 - Multiple trial sites
 - Additional trials in 2018 on limited trial sites
- Additional germplasm to be sent in 2018



Sino-UK Joint Innovation Laboratory for Potatoes

- \$4 million project to establish leading centre for applied potato research in China
- Verbally approved, awaiting written confirmation
- Areas of Science
 - Germplasm improvement and breeding
 - Pest and disease diagnosis and control
 - Key technologies for seed potato production
 - Storage technologies
 - Innovation in food and product development
- Director – Dr Kaiyun Xie
- Deputy Director – Prof Lesley Torrance



- Commercial collaboration with Technico Agri Sciences
 - Produce >12 million microtubers p.a.
 - > 3million microtubers exported
 - 48,000 tonnes of early generation seed potatoes grown
- Owned by ITC
 - Turnover >\$8 billion
 - Top 50 performing companies in Asia (Business Week)
 - India's Most Admired Company (Fortune India)
 - Paper, Hotels, Potato Snacks
- Germplasm trials in 2018



Kenya: Germplasm Trials

- Average yield in Kenya 10 tonnes / ha
- Scottish Seed sent to Kenya for trials (3 sites; different seasons)
 - 4 free varieties (Hermes, Russet Burbank, Atlantic, Cara)
 - 6 JHL-bred varieties
 - Initial results very promising
 - Harvest mid March 2018
- Supported by AHDB and SSCR



Quikgro Potato (BBSRC GCRF Award)

- Screening a range of germplasm to test whether potato containing the identified markers for earliness and stress balance will perform better in challenging environments in Kenya and Malawi
- Building a consortium with local stakeholders
 - disseminate results
 - exchange knowledge about the quikgro potato plan how to develop useful varieties
- Partners
 - Prof H Were (MMUST West Kenya)
 - CIP Nairobi
 - Dr P Demo (CIP, Malawi)
 - Mr O Mweyne (DARS, Malawi)
 - Prof Lesley Torrance (JHI)



Chitedze, Lilongwe, Malawi February 2018



Control site for Quikgro trials



Breeding Root, Tubers and Banana Products for End User Preferences

- The 5 year, 11.5 million-euro project will take a novel approach involving consumers, processors and researchers
- The RTBfoods project will be implemented with five partner countries: Benin, Cameroon, Ivory Coast, Nigeria and Uganda.
- **Main donors and co-funders:** Bill & Melinda Gates Foundation, CIRAD France (funding JHI)



Buea, Cameroon, Jan 2018



Other International Projects

- USA
 - Late blight molecular diversity (Cornell/ Oregon state)
 - dRenSeq in cultivars and breeding (Cornell and SIMPLOT)
 - *Germplasm trials*
- The Netherlands
 - RLP/RLK mapping and cloning in wild potato accessions (Wageningen)
 - dRenSeq development in potato cultivars (Wageningen)
 - Various EU projects
- Iceland
 - Exchange of germplasm for trialling
 - Highest per capita consumption of potatoes
 - Highest cost of potatoes in Europe
- Canada
 - Commercialisation of varieties
- Australia
- South Africa
- Turkey
- Germany



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