Breeding and genetics

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The ultimate objective of the research into breeding and genetics at SCRI is to facilitate the application of new technologies to end-user industries. The achievements which will mark the success of this goal are new, improved crop cultivars, produced in association with industrial partners, and improved scientific knowledge and practical technologies that will increase the efficiency and efficacy of crop improvement processes. In collaboration with various commercial sponsors, Kentish Garden Marketing Ltd and Scottish Soft Fruit Growers Ltd and the Hannah Research Institute, we have been profiling the flavour and mouthfeel of a wide range of raspberry and blackcurrant genotypes in fresh and various processed products. This will permit the more accurate targeting of the breeding programmes to produce new cultivars specifically suited to the needs and desires of the eventual end-user, the consumer.

The main target crops for improvement through breeding are potatoes, raspberry, blackberry, blackcurrant, strawberry and spring barley. In addition, underpinning research, funded by external contracts (e.g. EU), continues on legumes, and a small swede breeding (brassicas) programme is funded by an industrial partner. SCRI breeders have been highly successful historically, and currently the UK area share of SCRI-bred cultivars is significant: potatoes (17%), soft fruit (90%), and spring barley (10%).

Numerous new, improved cultivars have been released in recent years, as reported in previous SCRI Annual Reports, and others are currently undergoing statutory, National List Trials. Many of these, including the new so-called Glen MARS (Magna, Ample, Rosa, Shee) series of raspberry, and Symphony, our most recent strawberry, continue to perform well. Demand for Symphony and Glen Ample has continued to outstrip supplies. Estimates now indicate that Symphony will be the second most widely grown strawberry cultivar in the UK in 1999. It is largely the stability of cropping that has attracted growers to Symphony. Its tough skin gives it a distinct advantage in terms of reduced grading losses, especially under difficult harvesting conditions. This toughness, fortunately, is combined with a juicy flesh that has a good acid/sweetness balance. In addition, the cultivar has good tolerance of soil-borne pests and diseases.

New cultivar releases from SCRI are achieved by the collaborative efforts of breeders, geneticists, pathologists, nematologists, virologists, chemists and biochemists, and increasingly involves the fundamental researches of molecular biologists and tissue culture experts. This multidisciplinary activity allows the rapid adoption and development of novel technologies into the crop improvement process and, equally important but often neglected, permits research into the efficacy and efficiency of these technologies compared to classical methodology. It is one thing to propose a new experimental technique that will 'help the breeder', another to validate those proposals in a practical breeding programme which may be constrained by the real demands of the market-place and economics. The approach has conferred many advantages to the breeders and is at least partially responsible for past successes.

The research is also aided by access to SCRI's considerable germplasm resources, maintained in a high health state and immediately available to SCRI researchers. The Commonwealth Potato Collection, one of the smaller international genebanks of potatoes, has contributed disproportionately to its size in the improvement of the European Potato. Practically all modern cultivars, recently released, now possess the H1 gene originally discovered in the CPC *S. tuberosum* subsp. *andigena* accession CPC 1673 for example. The *Ribes* and *Rubus* collections are the world's largest, and unique to SCRI.