Cassava was introduced into Eastern Africa probably in the mid nineteenth century, and has become one of the most important sources of dietary carbohydrates in the region. While generalised statistics show large variation among countries in the relative importance of cassava (see Table 1), these fail to highlight the special role that cassava fills in local cropping systems and in the diets of rural populations.

Table 1: Production and human dietary importance of cassava in Eastern Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Cassava Production (in metric tonnes)</th>
<th>Importance of rootcrops in national diets (% of calories derived from rootcrops)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burundi</td>
<td>962,000</td>
<td>39 - mostly cassava</td>
</tr>
<tr>
<td>Kenya</td>
<td>635,000</td>
<td>9 -</td>
</tr>
<tr>
<td>Rwanda</td>
<td>471,000</td>
<td>29 - Other rootcrops more important</td>
</tr>
<tr>
<td>Tanzania</td>
<td>4,350,000</td>
<td>27 - nearly all cassava</td>
</tr>
<tr>
<td>Uganda</td>
<td>1,250,000</td>
<td>15 - mostly cassava</td>
</tr>
</tbody>
</table>

Source: FAO

The historical increase in popularity of cassava, as a result of the adaptation of this crop to exhausted soils and as a famine-relief crop of semi-arid areas prone to drought, is a trend that has continued during the past decade. Population increase has tended to lead to further impoverishment of soils and to migration from areas of high agricultural potential to areas of lighter and thinner soils and lower and less reliable rainfall, factors which have favoured cassava over most other food crops (de Bruijn and Guthrie, 1982). Another reason for increasing importance of cassava in some localities has been the deterioration of infrastructure servicing the production and marketing of long-established cash crops, with the development of a growing informal market for cassava as food for urban populations.

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The record of cassava research in the region shows this to have been sporadic and less than appears warrant by its importance to millions of people (see Beck, 1982). The work of Storey on breeding for resistance to cassava mosaic disease (Storey and Nichols, 1938) has become a classic in this field, but the allocation of resources for cassava research is probably better indicated by the fact that a bibliography on crop production research in East Africa, published in 1975, gives only 23 references on cassava from a total listing of 1716 papers. More recently, national cassava improvement programmes have been developed with the potential for sustained and interdisciplinary research. A regional meeting of cassava researchers in 1980 recommended that donor agencies give first priority to support for these programmes, and thereafter to regional activities (IDRC, 1982). IDRC has approved financial support to assist national programmes of Zanzibar, Rwanda and Uganda, and supports IITA in locating with the Rwanda programme a cassava research coordinator for Eastern Africa.

During the past decade, cassava research emphasis in the region has reflected the arrival of serious new pest problems - particularly cassava green mite (CGM) and cassava bacterial blight (CBB). The latter is still spreading to uninfected areas, and research resources are likely to be strained further by the impending spread of cassava mealy bug from West Africa. All three pest problems are recent introductions from the South/Central American region, and have diverted resources that might otherwise have been used to overcome longer established factors that keep yields low at the farm level. While published data on the effect of CGM on yield are few, the economic importance of the pest is likely to be greater as a consequence of its being favoured by dry condition, when people are already more prone to undernourishment and become more dependent on cassava for subsistence.

CGM does not reach pest status in its native South America, and little was known of its ecology when it was first discovered as a pest in Uganda in 1971 (Nyiira, 1976). It is much to the credit of national research programmes that within a few years significant progress was made in understanding its ecology and principles for control, which include the identification of resistant or tolerant crop varieties (Shukla, 1976).
Since 1976 several cassava programmes in Eastern Africa have screened germplasm provided by the International Institute for Tropical Agriculture (IITA) for resistance to CGM under conditions of high natural infestation (Hahn et al., 1980). More recently still, IITA has been able to incorporate this criterion in its own breeding programme in Nigeria, after the pest had spread westwards across Africa. Reasonable levels of resistance have been identified in some improved materials, and continued progress is required in this direction, since the use of acaricides cannot be economic for small producers of cassava in Africa. However, the development of an adequate level of resistance in the range of varieties needed by farmers to suit the ecological, cropping system and culinary requirements to be found in this diverse geographic region will be a slow process, at best. Beck (1982) reminds us that varieties resistant to cassava mosaic disease, despite their availability and dissemination for many years, have not proven sufficiently acceptable to producers and consumers, although these varieties undoubtedly have provided farmers with an additional strategy for reducing risk of famine. Similar difficulties can be expected in applying CGM resistance.

The unimportance of CGM in its native continent suggested an investigation of the potential for its control in Africa by natural enemies introduced from South America. This work was initiated in 1975 by the Commonwealth Institute for Biological Control (CIBC), with financial support from IDRC. Progress has been reported in trial introductions to Muguga, Kenya of selected predators identified on cassava in South America and screened in Trinidad (Girling et al., 1979), and this workshop will give you an opportunity of assessing more recent results and whether they may have applicability for national programmes in this region. Recently IITA has started to work also on biological control of CGM following promising results obtained in control of cassava mealy bug in West Africa; while it may be logical for biological control of CGM in Eastern Africa to be coordinated by CIBC, close cooperation between the programmes in Eastern and Western Africa will be essential. Practical experience with CGM control in countries of Eastern Africa may also facilitate control of the mealy bug in the future.
Biological control, like the example of mosaic disease control through use of resistant varieties, may also be subject to certain site-specific limitations to its effectiveness related to as yet unknown interactions with climate and cropping systems. Nyiira (1982) has argued persuasively for an integrated pest management (IPM) approach to CGM control.

Pest control for other small farmer crops in Eastern Africa has not always been as productive as initial technical results have indicated, and we may want to consider some lessons from past experiences.

One principle is that IPM should be developed within a cropping systems perspective. This would require a) an understanding of farmers' current practices, pest control decision making, and resources available for pest control, b) data on farm-level yield losses from pest infection at different crop growth stages and sources of variation in losses and infestation under a representative range of cropping situations, c) selection of pest control technology, and d) on-farm testing of the technology to include socioeconomic evaluation and farmers' assessment of compatibility with the overall farming system (see Zandstra et al, 1981; Matteson et al, 1984).

A second principle is that IPM needs to become institutionalized in national programmes, so that farm-level problems can be researched in an interdisciplinary manner and a permanent institutional ability to incorporate new problems and potentials is established within national crop improvement programmes (see Kirkby, 1984). Not all countries yet have the manpower resources to allocate a fulltime entomologist to the cassava improvement programme, and the appropriate priority to be given to pest control within cassava improvement in a particular country is a decision that can and should be taken only at the national level. However, it is in order to assist this process that the organisers of this workshop have invited each country to send a cassava breeder and an entomologist, who will be well placed to consider the options available and to collaborate in developing research and implementation strategies.
IDRC hopes that this workshop will also enable the CIBC regional programme on CGM to understand better the particular needs of national programmes for cooperation in this field, and that this will lead naturally into a wider cooperation among national programmes in other aspects of cassava improvement under the auspices of the new IITA regional programme. The scientists who comprise the national programmes are in the best position to identify ways in which regional activities can be most effective in catalysing cooperation among national efforts, to identify research methods and techniques which would give more useful results to farmers by extrapolation across national boundaries and across agroecological zones, and to help regional programmes to set priorities that are appropriate.
References


