Chapter 7

General discussion

During the survey on root crops such as sweet potato and cassava conducted in South Africa in 1996/1997 (van der Mescht *et al*., 1997), sweet potato was found to be the most important root crop in some areas and the second most important crop after maize (van der Mescht *et al*., 1997; Thompson *et al*., 1999). The aim of the present study was to determine the importance of sweet potato to rural households and the constraints that limit their production. The most important objective was to determine the incidence of pest and diseases, most importantly, viruses in terms of their geographical distribution. Most farmers regarded sweet potato as a traditional crop and it was grown as a food source for the family. Although yield obtained was to some extent low, it was indicated that sweet potato was also used for income-generation. The majority of rural farmers (96%) did not know what sweet potato viruses were and how they spread. The tradition of using the same planting material year after year was highly practised by most rural farmers and plant protection measures were seldom practised. The other main constraints to sweet potato production were pests such as moles, weevils and caterpillars.

The survey of pest and disease incidence during the 1997/1998 and 2001/2003 indicated that the prevalence of diseases and pests varied between provinces and was influenced by climatic factors. The average virus incidence was found to be very low for the country. This confirms that virus symptoms are rarely seen in fields of sweet potatoes in South Africa. Although virus symptoms were rarely observed in the field during surveys, variations in symptom expression were found when samples were indexed to *I. setosa*. Analysis by NCM-ELISA, DAS-ELISA and TAS-ELISA demonstrated that approximately 80% of samples were infected with viruses. In this study, nine viruses were found to infect sweet potatoes in South Africa, namely: SPFMV, SPMMV, SPLV, SPCFV, SPMSV, SPV G, SPV II, CMV and SPCSV (EA and WA strains). Viruses were

commonly found in mixed infections and rarely as a single infection. This is the first report of the following viruses: SPV II, SPV G, SPCSV (EA and WA strains) and SPMSV, SPCFV and possibly CMV infecting sweet potatoes in South Africa. SPFMV was found in 63% of samples tested, confirming that it is the most prevalent virus of sweet potato in South Africa. SPV G and SPV II were detected in 28 and 26% of samples respectively. Following SPFMV, these two viruses have the potential of becoming a threat to production of sweet potato in South Africa. It can also be speculated that South Africa could be the only country having a high incidence of these two viruses. SPMMV is still an important virus of sweet potato and its occurrence in few samples could be influenced by weather conditions limiting the distribution of its vector, whiteflies.

Occurrence of potyviruses, SPFMV, SPV II and SPV G, in such high percentages calls for immediate and effective means of controlling them. It was also found that viruses significantly decreased both marketable and total yield and also increased the amount of cracking in storage roots. Wild *Ipomoea* spp. are also reservoirs of viruses and together with volunteer plants, they should be eradicated as soon as they are seen in the field. Rouging is an effective tool to eliminate viruses. The poor expression of symptoms on infected sweet potato under field condition makes this form of virus control difficult. It is not possibly for farmers to familiarise themselves with virus symptoms and rouging of infected plants cannot be efficiently practised. Fortunately, SPCSV only occurs sporadically and its control can be based on preventing it from spreading to provinces where it is not yet prevalent.

The use of virus free planting material was found to give higher yields compared to infected ones. The occurrence of a high number of negative samples in Kwazulu Natal Province is evidence that the use of virus free material is important. Kwazulu Natal is one of the provinces that the ARC-Roodeplaat targeted when they started with the initiative of providing rural farmers with healthy and improved cuttings as part of empowering them so that they can start their own nursery blocks of clean cuttings. Breeding of resistant cultivars against potyviruses will have a tremendous contribution in reducing

sweet potato viruses. The development of broad-spectrum resistance using transgenic sweet potato will also help increase yield and quality of virus sensitive cutlivars.

7.1 References

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