

POTATO BREEDING FOR RESISTANCE TO BACTERIAL WILT IN KENYA

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SUMMARY

Pseudomonas solanacearum (bacterial wilt) is a major limiting factor in potato production in Kenya. In 1971 research was initiated to select potato cultivars resistant to bacterial wilt, to identify sources of resistance and to develop and maintain a potato germplasm collection. Seedlings grown in polythene sleeves are infected by soil inoculation. Survivors are transplanted to an infected plot and interplanted with highly susceptible clones. Resistant, flowering individuals are intercrossed and resulting seedlings screened again during the next season. Selected individuals are cloned for retesting and selection as commercial cultivars.

RESUME

Pseudomonas solanacearum (fletrissement bacterien) est un facteur limitant majeur dans la production de la patate au Kenya. En 1971 des travaux de recherche ont été entrepris pour sélectionner des cultivars de patate résistants à cette maladie, pour identifier les sources de résistance et pour développer et entretenir une collection de plasm germinatif de la patate. Les plantules cultivées dans des manchons polythènes sont infectées par l'inoculation du sol. Les survivantes sont repiquées sur une parcelle infectée et plantée en mélange avec des clones qui ont une sensibilité élevée. Les individus résistants et fleuris sont entrecroisés et les plantules qui en sont issues triées de nouveau pendant la saison suivante. Les individus sélectionnés passent au clone pour être testé de nouveau et sélectionnés sous forme de cultivars destinés au commerce.

RESUMEN

Pseudomonas solanacearum (marchitez bacterial) es uno de los principales factores limitantes de la producción de papa en Kenya. En 1971 se iniciaron las investigaciones para seleccionar cultivares de papa resistentes a la marchitez bacterial, identificar fuentes de resistencia y desarrollar y mantener una colección de germoplasma de papa. Se infectan plántulas, desarrolladas en mangas de polietileno, por inoculación del suelo. Los sobrevivientes se transplantan a un lote infectado y se intercalan con clones altamente susceptibles. Los individuos resistentes que florecen se intercrucan y la progenie resultante se selecciona, otra vez, durante la siguiente temporada. Los individuos seleccionados se propagan como clones para continuar pruebas de selección como cultivares comerciales.

INTRODUCTION

Potatoes in Kenya in 1971 occupied approximately 60,699 hectares, mostly between 1371 and 2742 meters altitude⁴. It is the second root crop to cassava in production. The climate of these areas is ideal for potato cultivation^{1,8}. Approximately 98 percent of potatoes are grown by small-scale and the remainder by larger scale farmers⁴. Two potato crops per year are commonly grown in Kenya. Nutritionally, the potato is as good as any other tropical root crop.¹² Presently, due to the changing of eating habit, ease of growing and of food preparation potato has become the most popular root crop in Kenya. According to the Ministry of Agriculture Annual Report⁵ potatoes give a higher return per hectare than maize, sunflower, cassava groundnuts, bean or sorghum. That the potato still has the status of a minor crop in Kenya is due partly to late blight (*Phytophthora infestans*), bacterial wilt (*Pseudomonas solanacearum*) and other problems of potatoes which were reviewed by Moreau⁶.

In Kenya bacterial wilt (*Pseudomonas solanacearum*) is severe and widespread between about 1400 and 2000 m.³ Approximately half of the potato crop in Kenya is grown within this altitude range. Late Blight (*Phytophthora infestans*) is more severe at higher altitudes (about 1800–2750 m). While cultivars with high resistance to late blight (*Phytophthora infestans*) have been introduced from temperate countries and some have been bred in Kenya, there is no commercial cultivar with resistance to bacterial wilt (*Pseudomonas solanacearum*).

BREEDING FOR RESISTANCE TO BACTERIAL WILT

In 1964 Robinson and Ramos⁹ reported that potato cultivation in Kenya would cease unless resistant cultivars were developed. No material under Kenyan conditions had sufficient wilt resistance, and it was

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