



Chili Anthracnose Research at AVRDC 1993-2002

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Anthracnose of *Capsicum* spp. is especially damaging to crops grown during the warm, wet season in the tropics and subtropics. AVRDC initiated a pepper/chili program in 1986, identified anthracnose as a top priority, and began searching for resistance sources. For the first few years screening emphasis was on *C. annuum*; it was conducted in spray-inoculated fields and with detached fruit in the lab by pin prick, spray, or drop inoculation. Progress was limited. There was little correlation between field and lab results, i.e. some field resistance was identified but could not be confirmed by lab inoculation. Field resistance correlated fairly closely with fruit size suggesting that in many cases lower incidence of infected fruit in the field was due to escapes. During this period *C. capsici* and *C. gloeosporioides* were considered the major anthracnose pathogens in Taiwan and elsewhere. It was realized in 1997 that several isolates at AVRDC identified as *C. gloeosporioides* were in fact *C. acutatum*, and that some of these isolates were collected in the early 1990s. A subsequent survey showed *C. acutatum* to be responsible for 60% of the anthracnose lesions in Taiwan and to be the primary agent in green fruit lesions. In 1997, a microinjection inoculation method was developed to evaluate anthracnose reactions of detached fruit, and the search for resistance shifted to other *Capsicum* spp. Green fruit resistance to *C. acutatum* was identified in 14 *C. baccatum*, *chinense*, and *frutescens* lines and ripe fruit resistance in some of the *baccatum* and *chinense* lines. These lines were also shown to be resistant to Taiwan isolates of *C. gloeosporioides* and *C. capsici*. AVRDC immediately began to make interspecific crosses between *C. annuum* and two of the more promising lines PBC 932 (*chinense*) and PBC 81 (*baccatum*). F₁ seed were not viable, but interspecific progeny were recovered from both crosses by in vitro culture of immature F₁ seed. Emphasis was placed on a susceptible *C. annuum* x PBC 932 cross from which three BC₃F₅ families expressing resistance in green and ripe fruit were identified in 2002.