

**Effect of chemical seed treatment on the germination and seedling growth
of canola under different soil conditions**

R.J. De Villiers^{1*}, S.C. Lamprecht² and G.A. Agenbag¹

¹ Department of Agronomy, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa

² ARC - Plant Protection Research Institute, Private Bag X5017, Stellenbosch 7600, South Africa

Studies in a temperature controlled greenhouse were conducted to determine if phytotoxic effects of chemical seed treatments found in incubation studies also have an effect on the germination- and seedling vigour of canola (cv Varola 44) seed planted in simulated field conditions and secondly to determine the efficiency of seed treatments in soils from different localities (naturally infested) and in soil artificially infested with soilborne pathogens. In the first experiment untreated (control) and seeds treated with 0.5X, 1.0X and 2.0X of the recommended rates of Cruiser[®] and a local mixture (SA-Combination) were planted at 5 and 10 mm depths in dry (10% of field water capacity), moist (50% of field water capacity) and wet (70% of field water capacity) pasteurized soil to ensure that only the phytotoxic effects of the seed treatments were measured. In general, results showed that some treatments (application rates) of both chemicals used delayed seed germination and therefore reduced the number of seedlings emerged after 9 days, especially when planted at a 5 mm depth in pasteurized dry soil, but not in moist (50% FWC) soil. In soils naturally infested with especially *Rhizoctonia* spp. and *Pythium* spp. (experiment two), seedling emergence, survival and plant height of treated seeds were significantly higher compared to that of untreated seed. In experiment three all the seed treatments significantly increased survival of canola seedlings in soil artificially infested with *Fusarium avenaceum*, *Pythium* F group, *P. irregulare*, *P. mamillatum*, *P. ultimum* var. *ultimum* and *Rhizoctonia* spp. under growth room conditions. Survival of seedlings was a more accurate or sensitive parameter than dry mass when evaluating the effect of seed treatments against damping-off of canola caused by these soilborne pathogens. Because no consistent differences for all parameters used were found between chemicals used, both chemicals should be regarded as efficient. More research is needed to test their efficiency against specific pathogens under field conditions before any recommendations with regard to registration and commercial use in the RSA can be made.

Keywords: Canola, germination, seedling disease, seedling growth, seed treatment