

ANTHRACNOSE RESISTANCE BREEDING OF LUPINS

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ABSTRACT

From all the cultivated lupin species, *Lupinus albus* has the highest grain-, protein- and oil content. The potential of this lupin species is approximately 100 000 ha in the summer- and winter rainfall areas, while annual import of plant protein by the animal feed industry, exceeds R1 milliard. Anthracnose is a devastating disease of *L. albus* and cultivation of lupins in some countries has been abandoned or reduced considerably as a result of high anthracnose incidence. Genetic resistance is considered the most economic long term control measure. The aim of this project is the release of *L. albus* cultivars with enhanced resistance to anthracnose in the industry.

One hundred and seventy single row plots (5m) were planted at Nootgedacht Research Station and evaluated for anthracnose resistance. These lines included 140 single plant progenies that showed enhanced levels of resistance in the greenhouse after artificial inoculation at both seedling and adult plant stage, 3 breeding lines (SAL60/88, SAL160/2-3 and SAL160/27) as well as commercial cultivars Esta, Kiev, Ronell, Astra, Vladimir and Tanjil. Plants were artificially inoculated with *Colletotrichum gloeosporioides* before flowering and again at early pod set stage. Plants were rated 4 weeks after first inoculation and again at 3 weeks after second inoculation using a 1-9 scale with 1 being highly resistant and 9 highly susceptible.

The majority of lines evaluated were moderately to highly susceptible to *Colletotrichum gloeosporioides*. A few lines exhibited enhanced levels of resistance but these lines are late maturing, making them unsuitable for production in the Western cape production areas. During flowering plants were damaged by insects and at early pod set stage plants were severely damaged by a hailstorm resulting in serious yield losses.

Despite continuous efforts to improve anthracnose resistance in *Lupinus albus* no lines were identified with high levels of resistance and suitable agronomic features. It is therefore recommended that this project should be terminated.