EPIDEMIOLOGY AND MANAGEMENT OF BLACKLEG ON CANOLA IN THE WINTER RAINFALL REGION OF SOUTH AFRICA

FINAL REPORT

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EXECUTIVE SUMMARY

Although regarded as an old crop in the world, canola was not grown commercially in South Africa until 1995 when farmers introduced it as an alternative crop to reduce their dependence on cereals. In 2001, 26 000 ha of canola was planted in the winter rainfall region, while the industry was established in the summer rainfall region with plantings of 2000 ha. Constraints hampering the expansion of canola include severe losses through wastage during harvesting, diseases and weeds. A survey conducted in 1999 in the winter rainfall region of South Africa revealed that blackleg (caused by *Leptosphaeria maculans*) is the most important disease of canola, with incidences of up to 100% recorded. To ensure an increase in the production of canola, new cultivars/accessions should be evaluated for resistance/tolerance to blackleg using local strains of the pathogen. Nurseries of blackleg disease were therfore established at Langgewens (Moorreesburg), Outeniqua (George) and Tygerhoek (Riviersonderend) experimental farms. Three replicates of 24 and 29 cultivars/accessions were planted at each site in 2000 and 2001, respectively. Subsequently blackleg infected stubble was distributed over the experimental plots. Blackleg incidences were recorded at several plant stages viz. seedling (cotyledon infection), vegetative (leaf and crown infection), flower (crown and stem infection) and seedpod (crown and seedpod infection). Cotyledon and crown infections are considered the most important phases of this disease, resulting in the highest seedling and mature plant mortality, respectively. Due to insufficient rain at Langgewens and Outeniqua experimental farms, seedling establishment was poor and low spore release rates from infected stubble occurred in 2000. Experimental plots were therefore irrigated the following season. This resulted in excellent seedling establishment at the Langgewens experimental farm in 2001, but unfortunately plots were accidentally sprayed with Muster (contaminated with another chemical compound) to control weeds, resulting in 100% seedling mortality. Replant of this experiment resulted in poor seedling establishment. Attempts to develop a disease nursery at Outeniqua experimental farm was again unsuccessfull and it was concluded that the poor seedling establishment was probably due to a herbicidal effect. Although sufficient rain occurred in 2000 at Tygerhoek experimental farm to ensure excellent seedling establishment, the situation changed later in the season with low incidences of blackleg on stems and crowns of the more resistant/tolerant

cultivars/accessions and negligible infection of seedpods. Highest incidences of blackleg were recorded on cultivar Hyola 420 at all growth stages, resulting in low yield and a blackleg infection rating of 1 (0 = susceptible and 10 = resistant/tolerant). Cotyledon and leaf infection were the lowest on cultivar Varola 48 CL in 2000. In 2001, however, little or no cotyledon infection occurred due to cold weather conditions, while leaf infection was the lowest on cultivars Varola 44 and Hyola 60. In both years, stem and crown infection increased toward the seedpod stage with highest incidences on cultivars/accessions Hylite 200, Hylite 200 TT, Hyola 42 and Hyola 420 in 2000 and Hylite 200 TT, Hyola 420, Karoo, Scoop, N503736, 44C71, 44C73 and 45C75 in 2001. Seedpod infection was recorded on all cultivars/accessions but the infection rate was higher on cultivars with high crown and stem infections. Cultivars planted in the winter rainfall region during 2000 and 2001 were Charlton, Dunkeld, Grousse, Hylite 200 TT, Hyola 42, Karoo, Monty, Oscar, Rainbow, Scoop, Varola 50 and 54. Although low incidences of blackleg were recorded for most of these cultivars, high cotyledon infection was recorded for Hylite 200 TT, Hyola 42 and Varola 54, and high crown infection for Hylite 200 TT, Hyola 42, Karoo and Scoop. It is therefore important that blackleg resistant/tolerant cultivars are recommended to promote sustainable production of canola and ensure an increase in production in the winter rainfall region of South Africa. Apart from planting resistant/tolerant cultivars, chemical treatment is an alternative method investigated worldwide to control blackleg of canola. Five chemicals viz. Benlate (1000 g/ha), Duet (900 ml/ha), Folicur (750 ml/ha), Tilt (400 ml/ha) and soap (sunlight liquid – 25 ml/10L) were evaluated in a disease nursery at Tygerhoek experimental farm for control of blackleg on three cultivars viz. Dunkeld, Hyola 420 and Monty. Three replicates of each chemical were applied on each cultivar at the vegetative and flower stages. Forty plants were sampled per plot at the seedpod stage and evaluated for blackleg infection of stems, crowns and seedpods. Although not significantly better than other chemicals in all cases, Duet was the most effective treatment on all cultivars resulting in the lowest infection rate. With the exception of cultivar Monty treated with Benlate, treatment with Duet yielded more although not statistically significantly more in all cases. However, before a chemical treatment is recommended the economical feasibility and optimal application time as indicated by a disease forecasting system, should be considered.