

**FUNGICIDE EVALUATION FOR THE CONTROL OF SCLEROTINIA HEAD ROT
OF SUNFLOWER**

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ABSTRACT

Sclerotinia head rot is a devastating disease of sunflower and is extremely difficult to control considering its wide host range and survival of sclerotia. Although many efforts have been made to deploy genetic resistance only moderate success has been obtained. In the absence of resistance, chemical control and crop rotation are important strategies in Sclerotinia control. Benomyl (Benlate) is the only product registered for Sclerotinia control on sunflower. It is important to evaluate the efficacy of other chemicals at various concentrations to broaden the spectrum under different climatic conditions.

Trials were planted at PANNAR Research Farms (Delmas and Greytown), and ARC-GCI (Potchefstroom) where sclerotinia head rot has occurred during previous seasons. The cultivar DK 4040 was planted in a randomised block consisting of three replications. Seeds were treated with Benomyl prior to planting to minimize stalk rot. The trial at Potchefstroom was artificially inoculated with *Sclerotinia sclerotiorum* prior to chemical spraying. Trials at Delmas and Greytown relied on natural infection. Treatments consisted of spraying with Benlate, Amistar, Punch Xtra, Switch, Sumisclex, BASF 512 LKF, BASF 5160f and BASF 512 LKF + Sumisclex. Fungicides were evaluated at the rate recommended by the supplier. Single and double applications were compared at 50% flowering and a second application 14 days later. Plots were evaluated for disease by measuring the percentage of infected plants as well as the % disease (severity) and yield was determined at maturity.

Trials at Delmas and Potchefstroom were not sprayed with the fungicides as a result of continuous rain during the time of fungicide application. No data on these localities were, therefore, collected. High incidence of sclerotinia was observed in the field trial planted at Greytown. Differences in Sclerotinia incidence were obtained, and all treatments, except for Punch Xtra (55.1%), had lower percentage of sclerotinia infected plants than the control (51.0%). The only significant difference obtained, however, was between Switch, applied when first symptoms appeared and repeated 14 days after first application (23.5%), and Punch Xtra (55.1%). The lowest percentage infected plants and % disease were observed in plots sprayed with Switch (23.5 and 19.2%), Sumisclex (27.2 and 19.2%) and BASF 5160f (28.4 and 15.8%).

Significant differences in yields were obtained between treatments. The highest yield obtained was with Benlate seed treatment (1718.4 kg/ha) that differed significantly from yields obtained by treatment with Sumisclex (729.5 kg/ha), Switch (792.5 kg/ha), BASF512 LKF (770.3 kg/ha) and Punch Xtra (911.0 kg/ha).

Results obtained from the cultivar trial indicated significant differences in susceptibility to sclerotinia head rot. The lowest percentage diseased plants and % disease were observed in DKF 68-22 (45.3 and 32.7% respectively). Agsun 5261 (86.1 and 74.1%) was the most susceptible cultivar.

OPSOMMING

Sklerotinia kopvrot is 'n ernstige sonneblomsiekte in Suid Afrika en is een van die moeilikste siektes om te beheer as gevolg van die wye gasheerreëks van die patogeen asook die vermoë van die vrugstrukture om vir baie lang tye in die grond te oorleef. Baie min vordering is gemaak om die genetiese weerstand van sonneblom teen sklerotinia te verbeter en die belangrikste beheermaatreëls is dus chemiese middels en wisselbou. Benomyl (Benlate) is die enigste produk wat op sonneblom geregistreer is vir die beheer van sklerotinia. Die doel van die projek is dus om die doeltreffendheid van ander chemiese middels te evalueer vir moontlike registrasie op sonneblom.

Proewe is by die PANNAR Navorsingsstasie te Delmas en Greytown asook

LNR-IGG (Potchefstroom) geplant. DK 4040 (vatbaar vir sklerotinia) is in 'n gerandomiseerde blokontwerp geplant wat uit 3 herhalings bestaan het. Al die saad is met Benomyl behandel om stamvrot te beperk. Die behandelings het uit Benomyl, Amistar, Punch Xtra, Switch, Sumisclex, BASF 512 LKF, BAS 5160f en BASF 512 LKF+Sumisclex bestaan. Elke swamdoder is teen die voorgeskrewe dosisse geëvalueer. Enkel- en dubbel dosisse is ook vergelyk tydens vroeë blomstadium en bespuitings is 14 dae na eerste bespuiting herhaal. Proewe te Potchefstroom is kunsmatig met *Sclerotinia sclerotiorum* besmet terwyl proewe te Delmas en Greytown op natuurlike besmetting aangewese was.

Geen bespuitings is by proewe te Delmas en Potchefstroom gedoen nie as gevolg van aanhoudende reën tydens tyd van toediening en geen resultate is dus beskikbaar vir hierdie lokaliteite nie. Die voorkoms van sclerotinia in die proewe te Greytown was hoog en beheer van al die behandelings, behalwe Punch Xtra (55.1%), was beter as die kontrole (51.0%) waar geen beheer toegepas is nie. Die enigste betekenisvolle verskille is egter verkry met Switch (23.5%), wat toegedien is sodra die eerste simptome waargeneem is en wat weer herhaal is na 14 dae en Punch Xtra (55.1%). Die laagste persentasie geïnfecteerde plante en persentasie sclerotinia is waargeneem in persele waar Switch (23.5 en 19.2%), Sumisclex (27.2 en 19.2%) en BASF 5160f (28.4 en 15.8%) toegedien is.

Betekenisvolle opbrengs verskille is waargeneem tussen die verskillende swamdoder behandelings. Die hoogste opbrengs is waargeneem in persele waar Benlate saadbehandeling toegepas is (1718.4 kg/ha). Dit het betekenisvol verskil van opbrengste verkry met Sumisclex (729.5 kg/ha), Switch (792.5 kg/ha), BASF512 LKF (770.3 kg/ha) en Punch Xtra (911.0 kg/ha).

Resultate wat vanaf die kultivarproef verkry is het op betekenisvolle verskille in vatbaarheid van die kultivars gedui. Die laagste persentasie geïnfecteerde plante en persentasie sclerotinia is in DKF 68-22 (45.3 en 32.7% onderskeidelik) waargeneem. Agsun 5261 (86.1 en 74.1%) was die vatbaarste kultivar.