A Study of Two Seed-Borne *Alternaria* Diseases on Choumoellier

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INTRODUCTION

The livestock industry in New Zealand is based on a pastoral farming economy, an important aspect of which is the utilisation of fodder crops as supplementary feed during seasons of poor pasture growth. Playing an important role in this regard are the two selections of choumoellier (Brassica oleracea var. acephala D.C.) usually referred to as giant choumoellier and medium stemmed choumoellier. The growing importance of choumoellier in feed crop rotations is indicated by the increased area sown, from 8,000 acres in 1933 to 130,000 acres in 1963 (New Zealand Farm Production Statistics, 1962-63). In the past, choumoellier seed has been imported from the United Kingdom but more recently the trend has been to promote locally grown seed. At the present time New Zealand's requirements are met in most years by South Island growers producing seed under the authority of a Government seed certification scheme.

In discussing brassica crops in New Zealand, Palmer (1966) stated that - "apart from weather variations, the main uncontrollable causes of yield variations are fungus diseases, insect pests and associated virus diseases". Seven fungus diseases are recorded in New Zealand on choumoellier (Table 1), five of which are evidenced by foliage lesioning in field stands.

TABLE 1

Pathogenic fungi recorded on choumoellier in New Zealand

Pathogen	Authority	
* Alternaria brassicicola (Schw.)Wilt.	Brien and Dingley,	1957
* Alternaria brassicae (Berk.)Sacc.	Morton,	1964
* Peronospora parasitica (Pers.)Tul.	Brien and Dingley,	1959
* Phoma lingum (Tode ex Fr.)Desm.	Neill and Brien,	1933
* Mycosphaerella brassicicola (Fr.)Lind.	Brien,	1939
Sclerotinia sclerotiorum (Lib.)Mass.	Cunningham,	1927
Plasmodiophora brassicae Woron.	Cunningham,	1922

Preliminary surveys in the Manawatu established that leaf infections caused by A.brassicae and A.brassicicola are prevalent and on the basis of the extent of the disease development these two fungi are considered to be of some significance in affecting yields of local choumoellier crops. Both pathogens are world-wide in distribution and have been studied on a number of brassica crops (Weimer, 1924, 1926; Neergaard, 1945; Rangel, 1945; Domsch, 1957; McDonald, 1959; Changsri and Weber, 1963). In general, published work reveals both species to be seed-borne and frequently of economic significance in :

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* Species which cause foliage symptoms

(a) causing seed and seedling death and thereby considerably affecting stand establishment;

(b) directly reducing yields in seed crops by infecting siliquas and seed.

To the author's knowledge there has been no formal study conducted on the seed-borne nature of the pathogens in choumoellier, but seed health surveys reported in the 1963 and 1964 annual reports of the Government Seed Testing Station (Palmerston North), show that the Alternaria species were present in a high percentage of the seed lines screened, thus indicating the prevalence of the diseases in choumoellier crops in this country.

In view of the lack of detailed research relating to the seed-borne nature of both pathogens in choumoellier seed, and the fact of both fungi being recorded in a high percentage of New Zealand seed lines, studies were undertaken, the main objectives of which were :

(i) to determine the extent to which both pathogens are associated with New Zealand certified seed lines;

(ii) to investigate the significance of A.brassicae and A.brassicicola in causing seed bed losses;

(iii) to investigate the role of both pathogens in causing reductions in yields of choumoellier seed crops;

(iv) to critically examine methods of health screening for *A.brassicae* and *A.brassicicola* in brassica seed.