REPORT PREPARED FOR THE BLACKCURRANT PRODUCT GROUP

ON

THE DIEBACK/BUDBREAK PROBLEM IN BLACKCURRANTS, *Ribes nigrum*

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SUMMARY

Many blackcurrant growers, nationally, reported serious crop yield losses of between 20 to 45% during the period, 1985-1987. This occurred as a result of extensive dieback/budbreak problems on canes. At the request of the industry Product Group an investigation commenced in 1986 to research the problem. This has revealed that: (1) currant clearwing, *Synanthedon tipuliformis* (Clerck) is the major cause of the dieback and budbreak failure in blackcurrant plantings in New Zealand.

Other organisms from various localised regions were also implicated in the overall problem. These were:

2) Currant bud mite or blackcurrant gall mite (causative agent of 'big bud' condition), *Cecidophyopsis ribis*

3) Mealybug, *Planococcus mali*

4) Strawberry mite (or very close relative), *Tarsonemus pallidus*;

in descending order of importance. These last three, although directly responsible for the lack of bud break in blackcurrants were of minor importance only in the national situation and did not contribute to the dieback problem. The last mentioned *T. pallidus* was confined to one

property in Nelson, where the problem of budbreak was restricted virtually to a serious infestation of the developing buds of the cultivar, 'Millist'.

Of all the causative agents listed, currant clearwing probably poses the greatest threat to the industry, because of difficulties experienced in effectively controlling this pest by conventional methods.

INTRODUCTION

Blackcurrant cultivars of European origin were first established in New Zealand by the early settlers. More recently Canadian cultivars have come into prominence. Some important pests and diseases accompanied the early unscreened plant introductions, but it was fortunate that the range of pests and diseases, available were fortuitously limited.

Black, red and white currants together with gooseberries are now grown in home gardens throughout much of the inhabited areas of New Zealand. Prior to the early 1970s quite low tonnages were manually harvested from commercial plantings and these were consumed in the main on the local market. With the advent of the mechanical harvester, predictions of heavy yields and reasonable monetary returns per kilogram achievable in the late 1970's, rapid expansion of the industry occurred, especially in the South Island, where conditions were most favourable for plant and fruit production. During the period 1978 to 1982 commercial plantings of blackcurrants, of which the cultivar 'Magnus' constituted around 85%, rose from less than 200 hectares to about 1450 hectares. The availability of cane cuttings and the ease of plant management, and initial good returns, contributed to this high rate of industry expansion. Cuttings supplied for planting by growers were often chemically treated, but this treatment appears in retrospect to have been inadequate in eliminating the total

complement of pests infesting them. Strict industry guidelines were not enforced.

The commercial blocks, which were established, were generally large and often separated from each other by considerable distances. Many growers set up independant management of their plantings with very substantial outlays. Plantings were managed well initially for pest and disease control in accordance with an intensive MAF spray programme advocated at the time. However, rapid changes in markets overseas and declining prices for fruit produced in New Zealand invoked industry changes here. Accompanying the blackcurrant surpluses in New Zealand and low profit margins for blackcurrants in the early 1980's, were cost cutting measures in the form of reductions in pest and disease control measures. Between 1982 and 1987 the area of commercial plantings decreased from some 1450 ha to less than 700 ha nationally. During this period insect/mite control measures were reduced on many properties. This measure was somewhat beneficial in the area of mite control, because phytophagous mite predators became largely responsible for keeping two-spotted mite down below economic thresholds. Two-spotted mite tends to increase in numbers and seriousness as a consequence of predator disruption, caused by intense broad spectrum insecticide programmes.

However, since the downturn in the profit margins of the industry caused many growers to adopt a minimal insecticide use programme pests such as currant clearwing gradually increased in numbers and importance until their population exploded during the period 1985/86. As a consequence larval feeding damage caused yield losses of from 20 to 45% (as reported by growers). The feeding activity and correlated yield losses were outwardly expressed in a number of ways.

1) Shoot tip death. On one property at Irwell studied closely during the winter through summer of 1986-87, shoot tip dieback became evident during the early spring growth phase. Dieback per plant averaged between 2 and 3 tips (5-20 cm) per bush on 'Magnus"

Analyses conducted on canes from this property and elsewhere showed that currant clearwing larval feeding activity was responsible. In about 50% of shoot tip deaths no feeding injury was directly evident on the tip growth, but death had resulted from the partial ring-barking of the cane at the point of entry of the newly hatched (neonate) larva of currant clearwing. This appears to be a relatively common behaviour pattern.

Secondary coral rots attack the dead shoot tip wood soon after death. At harvest the tip often breaks off and requires removal from the harvested fruit.

A second cause of shoot tip breakage but not necessarily cane tip death results from the thin bark patch where the currant clearwing moth escapes from a cane. This is caused by the mature larva chewing an exit window, left covered only by a thin bark layer for the adult moth to escape through.

Cane death in first and second year canes also occurs when high infestations of currant clearwing destroy a major proportion of the cane pith, which is important in the storage of food reserves for the plant and moisture conservation. Canes with major larval activity in the older, third and fourth year wood with secondary internal fungal infection often also shrivel in spring and die.

2) Budbreak. a) Poor budbreak in sections of cane can be directly attributed to the underlying currant clearwing larval infestation of the pith. Heavily infested canes often show serious budbreak problems, with new growth being restricted to the odd lateral and terminal buds.

b) Budbreak problems can also be directly associated with currant clearwing feeding. Firstly, as a consequence of the neonate larva entering the cane directly via the bud, or secondly, as a larva tunnels within the central pith region, the lateral buds are eaten out internally.

All these types of currant clearwing larval feeding cause serious depletions of food reserves in the plant and fruit yield losses. Besides currant clearwing and the other insect/mite problems associated with budbreak problems and poor yield performance, physical or environmental problems can also cause problems.

c) Early autumn frosts, prior to plants achieving bud dormancy can seriously affect normal budbreak. Early defoliation of blackcurrants which is often associated with leaf spot (*Mycosphaerella ribis*) or two-spotted mite outbreaks, promote premature bud break and the risk of frost damage.

d) Leafroller larvae too, may destroy buds by eating them out, but their importance has decreased in established commercial blackcurrant plantings generally. It appears the major problem period for leafroller attack occurs during the early growth years of establishing plants from cuttings.

General - Notes on the insects and mites associated with the problems of dieback and budbreak in blackcurrants.

1. Currant clearwing or Currant stem borer, *Synanthedon tipuliformis* (Lepidoptera : Sessiidae) (cover photographs).

Distribution

This species is generally distributed throughout lowland regions of New Zealand and occurs wherever currants and gooseberries are grown. The pest is restricted to these host plants.

Description

The adult moths are very distinctive, both male and female being generally similar in appearance. The body is blue-black, with a metallic sheen in fresh specimens, but of dull hue in old moths. The abdomen has four narrow segmental cross bands of gold-coloured scales in the male and three in the female. In both sexes there is a prominent, shieldlike tuft of long scales, the anal fan, at the posterior end of the abdomen.

The transparent wings, which are normally spread out while the moth is at rest, are mostly devoid of scales except along the veins, which are generally black with golden-purplish markings. Golden scales predominate in the apical region of the forewing and along the margins, while each forewing has a prominent area of black scales at about two-thirds the length of the wing from the body.

Body length ranges from 10 to 14 mm, width 2 to 3 mm, and wingspan some 16 to 20 mm.

The eggs which are about 0.6 mm in length, 0.4 mm in width and 0.3 mm in depth (somewhat brick-shaped) are olive-brown in colour. They are laid singly near the nodes or axillary buds, pruning or mechanical harvesting scars, moth exit wounds, or under loose bark, but may be aggregated when