



HORTICULTURE RESEARCH INTERNATIONAL
STOCKBRIDGE HOUSE

A REPORT TO THE HORTICULTURAL DEVELOPMENT COUNCIL
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CRISP LETTUCE: CONTROL OF DISEASES
UNDER CROP COVERS (FV38f)
YEAR 2

CAWOOD · SELBY · NORTH YORKSHIRE YO8 0TZ
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Summary

Lettuce was grown beneath film covers with fungicides sprayed through the covers to assess the effectiveness of the fungicide by recording the levels of disease at harvest. The lettuce, cultivar Saladin, was planted on 23 June, 14 July and 29 July and covered with Agryl P17 and Agryl P10, compared with a non-covered control. One treatment included a white on black mulch through which the lettuces were planted and covered with an Agryl P10 film cover. The fungicide programme consisted of Rovral, Favour and Benlate applied over the film covers.

The main diseases observed in the trial were Botrytis and downy mildew. In all three plantings the levels of Botrytis were higher beneath the film cover treatments. The fungicide spray programme reduced the levels of Botrytis in only the first planting, with no apparent reduction in the other two plantings.

The levels of downy mildew were low in the second planting and highest in the third planting. The P17 and P10 covers encouraged disease development but the fungicide spray programme significantly reduced disease levels. The disease was confined to the lowest leaves which were removed during trimming and therefore did not affect marketable yield.

The film cover treatments provided protection from aphids but reduced the proportion of Class I heads due to poor head shape, particularly for those plants grown beneath the P17 cover.

Introduction

Film covers have traditionally been used to advance maturity for early planted crops. The nonwoven cover types such as Agryl can remain on crops for longer periods than the perforated polythene types which generally have to be removed by early May.

Over the past two seasons trials by HRI and ADAS have shown that the nonwoven cover types can provide protection against pest attacks, particularly lettuce root aphid, carrot fly and cabbage root fly. However some crops, including lettuce, can be more susceptible to disease problems when grown during the summer under film covers.

This trial, in its second year, aimed to confirm the results obtained in 1991 where good disease control was achieved by spraying fungicides through the film covers. There was a significant increase in marketable yield in the final planting in 1991 due to improved control of downy mildew. In 1992 three planting dates were used with two cover types, the standard P17 gauge and also the thinner P10 gauge material.

Objective

To assess the performance of fungicides when sprayed through nonwoven film covers for disease control in lettuce planted on three occasions during the summer.

Materials and Methods

Site

HRI Stockbridge House, Cawood, Selby, North Yorkshire, YO8 0TZ

Soil Type

Sandy loam of the Quorndon Series.

Design

The experimental design was a randomised block with four replicates. Each plot consisted of four rows spaced at 37.5 cm per 1.83 m bed with 20 plants per row spaced at 30 cm.

Statistical Analysis

All the data was subjected to an analysis of variance. Where appropriate the data was angularly transformed to improve the validity of the analysis. The least significant differences (LSDs) are provided at the 5% level of significance. Where the differences were not significant then this is indicated by NS (not significant).

Treatments

1. Planting Date:

- a. 23 June
- b. 14 July
- c. 29 July

2. Fungicide Treatment:

- a. Nil (only pre-planting fungicides applied)
- b. Full spray programme (pre and post-planting fungicides applied)

3. Film cover Type:

- a. No cover
- b. Agryl P17 (17 g/m²) - a medium weight nonwoven cover
- c. Agryl P10 (10 g/m²) - lightweight nonwoven cover
- d. White on black polythene mulch plus Agryl P10 cover

The fungicide spray programme consisted of the following applications:

| <u>Product</u> | <u>Rate</u> | <u>Timing</u> |
|----------------------|-----------------|--------------------------|
| Rovral | 380 g/750 l/ha | 7-14 days after planting |
| Favour | 1.5 l/750 l/ha | 7 days later |
| Rovral | 380 g/750 l/ha | 7 days later |
| Favour | 3.0 l/750 l/ha | 7 days later |
| Benlate [#] | 500 g/1000 l/ha | 7 days later |

Note: [#] Due to the fast growth the Benlate spray was not applied to plantings 1 and 2.

All sprays were applied using an Oxford Precision sprayer.

Assessments

1. Disease severity prior to the first harvest based on 10 plants per plot.
2. Yield and quality at harvest (30 plants/plot).
3. Disease incidence on harvested heads.

Note: In the first planting a minimum marketable trimmed head weight of 400 g was used as plant vigour had been reduced due to lettuce root aphid attack. For the other plantings a minimum head weight of 500 g was used.

Husbandry

Lettuce, cultivar Saladin, were sown on three occasions in an unheated glasshouse. Prior to planting the plants were treated with a routine fungicide spray of Thiram and Zineb. After planting the appropriate covers were laid and fungicides applied according to the treatments. All crop husbandry details are given in Appendix I.

Results

First Planting

The first planting was harvested from 30 July to 14 August. The film covers advanced maturity by between 3-6 days.

The disease levels in the first planting were low with only a few heads with Botrytis (mean 5.3%). The levels of Botrytis at the first harvest were higher on the plants grown beneath the Agryl P17 and Agryl P10 covers (10% and 9.2% respectively) but this was reduced where fungicides had been applied through the cover (5.8% and 3.3% respectively).

The yield data is shown in Figs 1 and 2 and Appendix II, Table A.

Fig 1. Number of Class 1 heads (%)

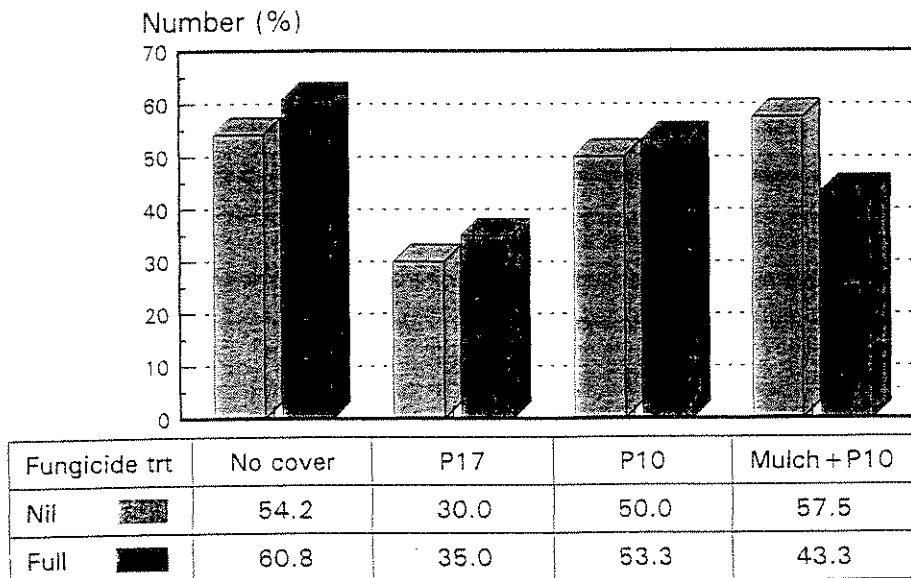
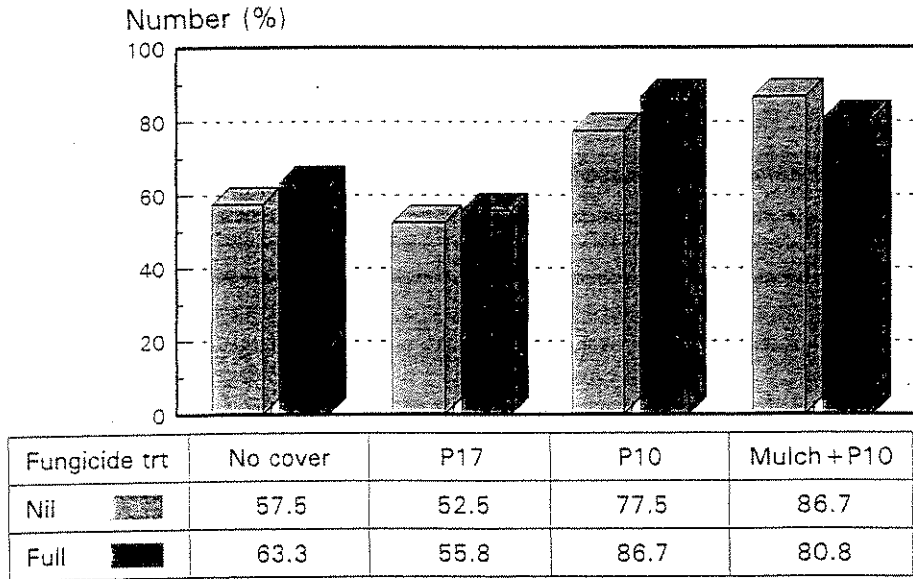


Fig 2. Number of marketable heads (%)



The results show that in a low disease situation there was no consistent effect in terms of marketability from using a fungicide spray programme. There were significant differences between the cover treatments with lower numbers of Class I heads for the P17 treatment. The P10 treatment and mulch plus P10 treatments gave significantly higher numbers of marketable heads than the control or the P17 treatment where heads tended to be small and loose/mis-shapen respectively.

Second Planting

The second planting was harvested between 24 August and 9 September. The results for the disease assessments taken prior to the first harvest are shown in Tables 1 and 2.

Table 1: Severity and number of heads with Botrytis at harvest - angle transformations (actual percentage in parenthesis).

| Cover Treatment | Severity Score (0 = Nil, 10 = Severe) | | | No. of Heads with <u>Botrytis</u> (%) | | |
|-------------------------------|--|------|------|--|-------------|------|
| | Nil | Full | Mean | Nil | Full | Mean |
| No cover | 0.2 | 0.2 | 0.2 | 3.7 (1.7) | 0 (0) | 1.9 |
| Agryl P17 | 2.1 | 1.9 | 2.0 | 23.0 (15.8) | 27.1 (21.7) | 25.1 |
| Agryl P10 | 2.2 | 2.1 | 2.1 | 22.0 (14.2) | 25.7 (19.2) | 23.9 |
| Mulch + P10 | 1.7 | 0.7 | 1.2 | 20.2 (13.3) | 21.0 (16.7) | 20.6 |
| Mean | 1.5 | 1.2 | 1.4 | 17.2 | 18.4 | 17.8 |
| LSD (21 df) for comparing: | | | | | | |
| Means of fungicide treatments | 0.35 (NS) | | | 6.03 (NS) | | |
| Means of cover treatments | 0.49 | | | 8.53 | | |

The severity of Botrytis at harvest was low and similar for both fungicide treatments. There were significantly higher levels of Botrytis where film covers had been used with no apparent reduction where a full fungicide spray programme had been used. At harvest the average number of heads with Botrytis was 17.8% and similar for all covered treatments. Levels in the non-covered control were negligible and significantly lower.

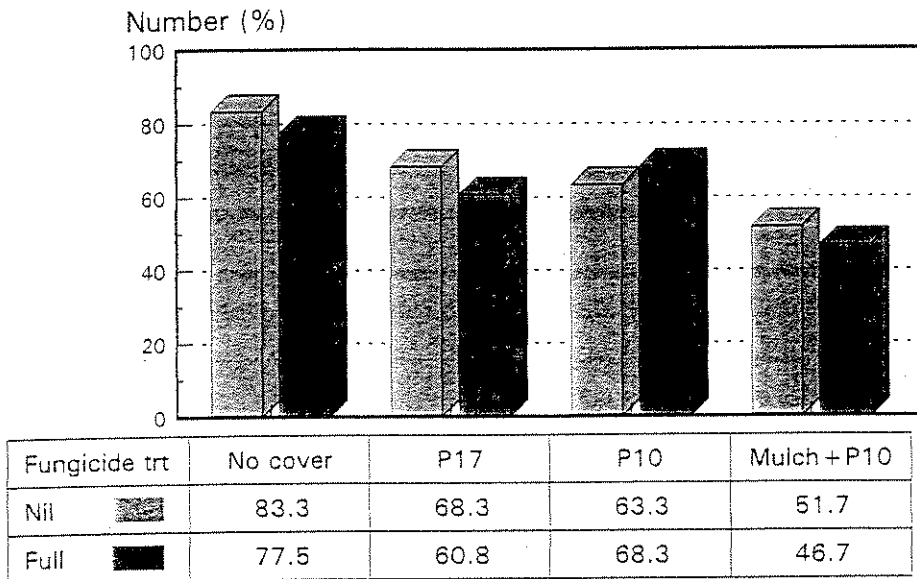
Table 2: Levels of downy mildew at harvest.

| Cover Treatment | % Basal Area with Mildew | | | Severity Score (0=Nil, 10=Severe) | | |
|-------------------------------|--------------------------|------|------|--------------------------------------|------|------|
| | Nil | Full | Mean | Nil | Full | Mean |
| No cover | 0.6 | 0.5 | 0.6 | 0 | 0 | 0 |
| Agryl P17 | 2.5 | 2.4 | 2.5 | 0.8 | 0.3 | 0.6 |
| Agryl P10 | 3.9 | 2.7 | 3.3 | 0.7 | 0.3 | 0.5 |
| Mulch + P10 | 0.9 | 1.3 | 1.1 | 0 | 0 | 0 |
| Mean | 2.0 | 1.7 | 1.9 | 0.4 | 0.2 | 0.3 |
| LSD (21 df) for comparing: | | | | | | |
| Means of fungicide treatments | 0.96 (NS) | | | 0.35 (NS) | | |
| Means of cover treatments | 1.35 | | | 0.49 | | |

The levels of downy mildew were low overall with the non-covered treatment having a lower amount of disease. The covers increased the severity of the disease but where a mulch had been used then the incidence was negligible. The full fungicide spray programme did not reduce the levels of downy mildew.

The yield data is shown in Fig 3 and Appendix II, Table C.

Fig 3. Number of Marketable heads (%)



The number of Class I heads from beneath the covered treatments was low (mean 3.6%) due to poor head shape which resulted in a high proportion of heads falling into the Class II quality grade. The non-covered treatments gave 62.1% Class I heads (Appendix II). The number of marketable heads was similar for all treatments except for the mulch + P10 cover treatment where marketable yields were lower. There was no apparent yield benefit from using a fungicide programme. Head quality was otherwise good with lack of head weight the main cause of unmarketability for the non-covered and mulched treatments and tipburn for the covered treatments.

Third Planting

The third planting was harvested from 14 September to 1 October. The results for the disease assessments taken prior to the first harvest are given in Tables 3 and 4.

Table 3: Severity of Botrytis at harvest.

| Cover Treatment | Severity Score (0 = Nil, 10 = Severe) | | |
|-----------------|---------------------------------------|------|------|
| | Nil | Full | Mean |
| No cover | 0 | 0 | 0 |
| Agryl P17 | 0.5 | 1.0 | 0.8 |
| Agryl P10 | 0.3 | 0.2 | 0.3 |
| Mulch + P10 | 0.7 | 0.3 | 0.5 |
| Mean | 0.4 | 0.4 | 0.4 |

LSD (21 df) for comparing:

| | |
|-------------------------------|-----------|
| Means of fungicide treatments | 0.27 (NS) |
| Means of cover treatments | 0.37 |

The film covers encouraged the development of Botrytis but levels were very low. The full fungicide spray programme did not reduce the incidence of this disease. The number of trimmed heads with Botrytis at harvest was negligible.

Table 4: Severity of downy mildew at harvest.

| Cover Treatment | % Basal Area with Mildew | | | Severity Score (0=Nil, 10=Severe) | | |
|--|--------------------------|------|------|--------------------------------------|------|------|
| | Nil | Full | Mean | Nil | Full | Mean |
| No cover | 0.1 | 0.1 | 0.1 | 0 | 0 | 0 |
| P17 | 14.9 | 1.1 | 8.0 | 4.9 | 0.2 | 2.6 |
| P10 | 13.5 | 0.5 | 7.0 | 2.9 | 0.1 | 1.5 |
| Mulch + P10 | 2.7 | 0.8 | 1.8 | 0.9 | 0.2 | 0.6 |
| Mean | 7.8 | 0.6 | 4.2 | 2.2 | 0.1 | 1.2 |
| LSD (21 df) for comparing: | | | | | | |
| Interaction of cover x fungicide treatment | | 8.12 | | 0.79 | | |

The levels of downy mildew from the third planting were the highest recorded in the trial. The cover treatments encouraged the development of downy mildew but the use of a mulch reduced the severity. For all covered treatments there was a significant reduction in disease level following the full fungicide spray programme. The disease levels in the non-covered were negligible irrespective of fungicide treatment. There was a significant interaction between cover and fungicide treatment with the full spray programme significantly reducing the levels of disease where P17 and P10 covers had been used.

The yield data is shown in Figs 4 and 5 and Appendix II, Table E.

Fig 4. Number of Class 1 heads (%)

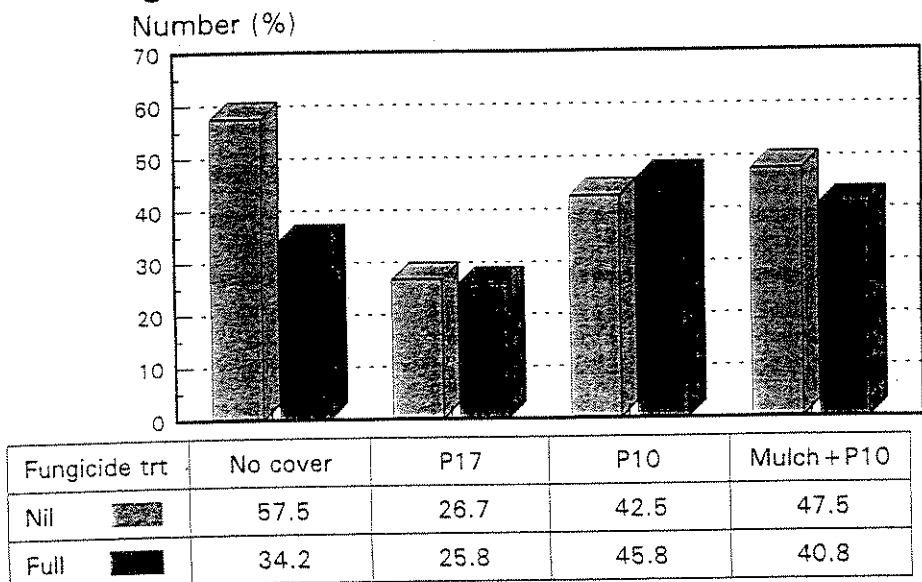
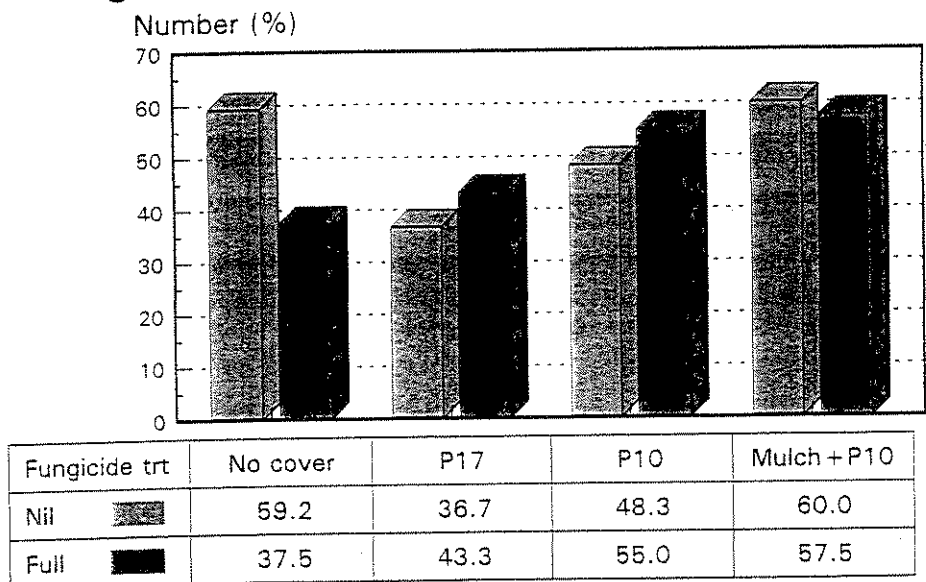


Fig 5. Number of Marketable heads (%)



The number of Class I heads was higher than in the second planting due to a reduction in the number of mis-shapen heads. Although there were increased levels of downy mildew in the non-sprayed covered treatments this was confined to the lower leaves which were removed during trimming and thus did not affect either the number of Class I or marketable heads.

The main reason for downgrading was due to lack of head weight with only a low number of heads with tipburn. There was on average 8% missing plants from the mulch treatments due to poor plant establishment after planting through the polythene mulch.

Discussion

The film covers avoided the need to apply insecticides for lettuce root aphid and foliar aphids but encouraged both Botrytis and downy mildew. The disease levels were, however, reduced by applying the fungicides through the film covers. The film cover type did not affect the performance of the fungicides and gave a similar reduction in disease severity under both the P17 and P10 covers. The mulch treatment reduced the levels of downy mildew on the lower leaves.

The film covers reduced the proportion of Class I heads due to an increase in the number of mis-shapen heads, particularly from beneath the P17 treatment. The fungicide treatment had no consistent effect on marketability, probably due to the generally low incidence of the two main diseases and the confinement of the diseases to the outer leaves which were removed during trimming to an iceberg standard.

Conclusions

1. Film crop covers increased the levels of both Botrytis and downy mildew compared to the non-covered control.
2. The mulch significantly reduced the incidence of downy mildew.
3. Applying fungicides through the film covers did not appear to reduce the efficacy of the chemical and gave good control during high disease pressure in September.
4. The fungicide treatment did not improve marketable yield as the levels of disease were low and mainly confined to the lower leaves which were removed during trimming.
5. The film cover treatments generally improved head size but the P17 treatment did increase the proportion of mis-shapen heads.

Recommendations

The trial should be repeated for a third year due to the variable results obtained in 1992. The film covers provided excellent control of leaf aphids and offer an alternative to insecticidal sprays. The film covers did encourage disease levels but the fungicides worked well when sprayed through the covers. The potential of mulches for reducing the levels of downy mildew as well as controlling weeds should be evaluated more fully to confirm these results. The reasons for poor head shape beneath film covers needs to be identified.

Various disease models are being developed at HRI Wellesbourne which are aimed at predicting likely infection attacks on certain crops. The models use meteorological data (temperature, RH, crop wetness and rainfall) and could be very important in the future to ensure that fungicide sprays are applied prior to critical infection periods rather than on routine basis. Improved timing of fungicides to coincide with likely infection periods might help reduce the risks associated from over-use of certain chemicals and possibly delay resistance developing. Funds from the HDC could be used to aid the development of a disease model for Botrytis and downy mildew in lettuce and other leafy salad crops.

The legal position of applying fungicides through film crop covers is unclear and this trial was carried out with the understanding that the crop would be destroyed. Samples from certain treatments have been sent for residue analysis. The results will be sent to the HDC after completion in late December.

APPENDIX I: CROP DIARY

Planting Date 1 (Field E)

| | |
|-----------|--|
| 29 May | Saladin sown in 38 mm peat blocks (B2). |
| 16 June | 125 kg/ha N, 250 kg/ha P ₂ O ₅ , 125 kg/ha K ₂ O. |
| 18 June | Fertiliser incorporated and beds profiled for mulch treatments. |
| 22 June | Mulches laid by machine. |
| 23 June | Planted and irrigated 20 mm. |
| 24 June | Kerb @ 2.2 kg/600 l/ha water. Covers laid as appropriate. |
| 25 June | Irrigated 20 mm. |
| 30 June | Irrigated 20 mm. |
| 2 July | Rovral @ 380 g/750 l/ha water as appropriate. Pirimor @ 500 g/1000 l/ha water (non-covered treatments). |
| 7 July | Pirimor @ 500 g/1000 l/ha water (non-covered treatments). |
| 9 July | Favour @ 1.5 l/750 l/ha water as appropriate. |
| 10 July | Pirimor @ 500 g/1000 l/ha water (non-covered treatments). |
| 13 July | Pirimor @ 500 g/1000 l/ha water (non-covered treatments). |
| 17 July | Rovral @ 380 g/750 l/ha water as appropriate. |
| 21 July | Pirimor @ 500 g/1000 l/ha water (non-covered treatments). |
| 24 July | Favour @ 3 l/750 l/ha water as appropriate. |
| 28 July | Pirimor @ 500 g/1000 l/ha water (non-covered treatments). |
| 29 July | Irrigated 15 mm. |
| 30 July | Uncovered and first harvest. |
| 14 August | Final harvest. |

Planting 2 (Field E)

15 June Saladin sown in 38 mm peat blocks (B2).

6 July 125 kg/ha N, 250 kg/ha P₂O₅, 125 kg/ha K₂O.

7 July Fertiliser incorporated.

8 July Beds profiled for mulch treatments and mulches laid by machine.

10 July Pirimor @ 50 g/100 l water (pre-planting drench).

14 July Planted.

15 July Kerb @ 2.2 kg/600 l/ha water.
Covers laid as appropriate.
Irrigated 20 mm.

21 July Rovral @ 380 g/750 l/ha water as appropriate.
Pirimor @ 500 g/1000 l/ha water (non-covered treatments).

28 July Pirimor @ 500 g/1000 l/ha water (non-covered treatments).

29 July Irrigated 15 mm.

31 July Favour @ 1.5 l/750 l/ha water as appropriate.

6 August Rovral @ 380 g/750 l/ha water as appropriate.

11 August Pirimor @ 500 g/1000 l/ha water (non-covered treatments).

19 August Favour @ 3 l/750 l/ha water as appropriate.

24 August Uncovered.

25 August First harvest.

9 Sept Final harvest.

Planting Date 3 (Field E)

7 July Saladin sown in 38 mm peat blocks (B2).

22 July 125 kg/ha N, 250 kg/ha P₂O₅, 125 kg/ha K₂O.

23 July Fertiliser incorporated and beds profiled for mulch treatments.

24 July Mulches laid by machine.
Pirimor @ 50 g/100 l water (pre-planting drench).

29 July Planted.
Kerb @ 2.2 kg/500 l/ha water.
Irrigated 20 mm.

30 July Covers laid as appropriate.

11 August Rovral @ 360 g/750 l/ha water as appropriate.
Pirimor @ 500 g/1000 l/ha water (non-covered treatments).

18 August Favour @ 1.5 l/750 l/ha water as appropriate.

28 August Rovral @ 380 g/750 l/ha water as appropriate.

1 Sept Favour @ 3 l/750 l/ha water as appropriate.

8 Sept Benlate @ 500 g/1000 l/ha water as appropriate.

10 Sept Uncovered.

14 Sept First harvest.

1 Oct Final harvest.

APPENDIX II:

Table A: Yield data from Planting 1 - angle transforms (actual percentage stated in Figs 1 and 2).

| Treatment | Class I | Class II | Marketable |
|------------------------------|--------------|--------------|--------------|
| <u>Nil Fungicide</u> | | | |
| Nil cover | 47.4 | 7.2 | 49.4 |
| P17 | 33.1 | 27.6 | 46.4 |
| P10 | 45.0 | 31.4 | 62.8 |
| Mulch + P10 | 49.4 | 32.6 | 71.8 |
| Mean | 43.7 | 24.7 | 57.6 |
| <u>Fungicide</u> | | | |
| Nil cover | 51.5 | 6.4 | 53.0 |
| P17 | 36.2 | 27.0 | 48.4 |
| P10 | 46.9 | 35.2 | 70.6 |
| Mulch + P10 | 41.1 | 37.7 | 64.4 |
| Mean | 43.9 | 26.6 | 59.1 |
| LSD (21 df) for comparing: | | | |
| Mean of fungicide treatments | 4.51 (NS) | 4.78 (NS) | 6.80 (NS) |
| Mean of cover treatments | 6.39 | 6.76 | 9.63 |

Table B: Yield data from Planting 1 - angle transforms (actual percentage in parenthesis).

| Treatment | Mis-shaped /Loose | Small | Marketable Mean Head Weight (g) |
|---------------------------------|----------------------|--------------|---------------------------------------|
| <u>Nil Fungicide</u> | | | |
| Nil cover | 17.7 (9.2) | 33.7 (31.7) | 475 |
| P17 | 27.7 (21.7) | 19.9 (14.2) | 456 |
| P10 | 20.1 (12.5) | 14.6 (8.3) | 498 |
| Mulch + P10 | 11.7 (5.8) | 9.1 (5.0) | 490 |
| Mean | 19.1 | 19.3 | 480 |
| <u>Fungicide</u> | | | |
| Nil cover | 12.1 (5.8) | 31.2 (27.5) | 483 |
| P17 | 23.5 (16.7) | 26.2 (20.0) | 472 |
| P10 | 16.5 (9.2) | 8.0 (4.2) | 508 |
| Mulch + P10 | 19.5 (11.7) | 8.3 (4.2) | 484 |
| Mean | 17.9 | 18.4 | 487 |
| LSD (21 df) for comparing: | | | |
| Mean of fungicide treatments | 4.87 (NS) | 7.22 (NS) | 19.3 (NS) |
| Mean of cover treatments | 6.89 | 10.19 | 27.3 |

Table C: Yield data from Planting 2 - angle transforms (actual percentage in parenthesis unless stated elsewhere in report).

| Treatment | Class I | Class II | Marketable |
|------------------------------|-------------|-------------|------------|
| <u>Nil Fungicide</u> | | | |
| Nil cover | 52.0 (61.7) | 26.5 (21.7) | 66.6 |
| P17 | 7.2 (3.3) | 54.1 (65.0) | 56.0 |
| P10 | 15.2 (10.0) | 47.0 (53.3) | 52.9 |
| Mulch + P10 | 12.1 (5.8) | 42.5 (45.8) | 46.0 |
| Mean | 21.6 | 42.5 | 55.4 |
| <u>Fungicide</u> | | | |
| Nil cover | 52.4 (62.5) | 22.5 (15.0) | 62.0 |
| P17 | 2.6 (0.8) | 50.9 (60.0) | 51.5 |
| P10 | 0 (0) | 56.1 (68.3) | 56.1 |
| Mulch + P10 | 3.7 (1.7) | 42.1 (45.0) | 43.1 |
| Mean | 14.7 | 42.9 | 53.2 |
| LSD (21 df) for comparing: | | | |
| Mean of fungicide treatments | 5.16 | 4.2 (NS) | 4.91 (NS) |
| Mean of cover treatments | 7.30 | 5.95 | 6.95 |

Table D: Yield data from Planting 2 - angle transforms (actual percentage in parenthesis).

| Treatment | Tipburn | Small | Marketable Mean Head Weight (g) |
|------------------------------|-------------|-------------|---------------------------------|
| <u>Nil Fungicide</u> | | | |
| Nil cover | 3.7 (1.7) | 18.3 (13.3) | 636 |
| P17 | 18.6 (10.8) | 10.1 (4.2) | 596 |
| P10 | 20.7 (13.3) | 15.5 (7.5) | 619 |
| Mulch + P10 | 13.3 (7.5) | 23.6 (20.8) | 618 |
| Mean | 14.1 | 16.9 | 617 |
| <u>Fungicide</u> | | | |
| Nil cover | 2.6 (0.8) | 25.7 (20.0) | 589 |
| P17 | 14.7 (6.7) | 15.1 (9.2) | 610 |
| P10 | 6.4 (2.5) | 16.1 (8.3) | 615 |
| Mulch + P10 | 12.6 (6.7) | 20.4 (15.8) | 613 |
| Mean | 9.1 | 19.4 | 607 |
| LSD (21 df) for comparing: | | | |
| Mean of fungicide treatments | 5.51 (NS) | 6.66 (NS) | 19.4 (NS) |
| Mean of cover treatments | 7.8 | 9.42 (NS) | 27.5 (NS) |

Table E: Yield data from Planting 3 - angle transforms (actual percentage in parenthesis unless stated elsewhere in report).

| Treatment | Class I | Class II | Marketable |
|------------------------------|-----------|-------------|------------|
| <u>Nil Fungicide</u> | | | |
| Nil cover | 49.5 | 3.7 (1.7) | 50.5 |
| P17 | 30.1 | 18.1 (10.0) | 36.7 |
| P10 | 40.6 | 11.9 (5.8) | 44.0 |
| Mulch + P10 | 43.5 | 20.6 (12.5) | 50.9 |
| Mean | 40.9 | 13.6 | 45.5 |
| <u>Fungicide</u> | | | |
| Nil cover | 35.0 | 9.0 (3.3) | 37.1 |
| P17 | 29.8 | 24.2 (17.5) | 41.0 |
| P10 | 42.6 | 17.2 (9.2) | 47.9 |
| Mulch + P10 | 39.6 | 24.0 (16.7) | 49.3 |
| Mean | 36.8 | 18.6 | 43.8 |
| LSD (21 df) for comparing: | | | |
| Mean of fungicide treatments | 6.80 (NS) | 3.29 | 6.19 (NS) |
| Mean of cover treatments | 9.63 | 4.66 | 8.78 (NS) |

Table F: Yield data from Planting 3 - angle transforms (actual percentage in parenthesis).

| Treatment | Tipburn | Small | Marketable Mean Head Weight (g) |
|---------------------------------|--------------|--------------|---------------------------------------|
| <u>Nil Fungicide</u> | | | |
| Nil cover | 5.3 (1.7) | 36.5 (35.8) | 572 |
| P17 | 10.4 (6.7) | 43.1 (46.7) | 552 |
| P10 | 2.6 (0.8) | 43.0 (46.7) | 565 |
| Mulch + P10 | 6.4 (2.5) | 29.4 (25.0) | 572 |
| Mean | 6.2 | 38.0 | 565 |
| <u>Fungicide</u> | | | |
| Nil cover | 12.8 (6.7) | 47.2 (53.3) | 540 |
| P17 | 0 (0) | 46.1 (51.7) | 541 |
| P10 | 3.7 (1.7) | 39.7 (40.8) | 567 |
| Mulch + P10 | 2.6 (0.8) | 34.5 (32.5) | 572 |
| Mean | 4.8 | 41.9 | 555 |
| LSD (21 df) for comparing: | | | |
| Mean of fungicide treatments | 5.72 (NS) | 5.51 (NS) | 15.1 (NS) |
| Mean of cover treatments | 8.11 (NS) | 7.78 | 21.3 (NS) |