ROTHAMSTED RESEARCH

Yields of the Field Experiments 1990

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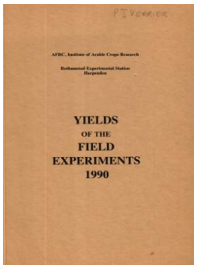

Sunflowers

Rothamsted Research

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90/R/SU/1

SUNFLOWERS

VARIETIES AND SOWING DATES

Object: To study the effects of five sowing dates on the rates of vegetative and floral development, days to maturity, disease and yield of two varieties of sunflowers - Great Harpenden I.

Sponsors: V.J. Church, C.J. Rawlinson.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 3.5 x 10.0.

Treatments: All combinations of:-

1. **VARIETY** Varieties:

SUNB 246	Sunbred 246
S 47	S47

2. **SOWDATE** Sowing date:

15 MAR	15 March, 1990
5 APR	5 April
18 APR	18 April
30 APR	30 April
10 MAY	10 May

NOTE: Plots were netted against birds from sowing until harvest.

Basal applications: Manures: (13:13:21) at 380 kg. Weedkillers: Trifluralin at 1.1 kg in 220 l. Linuron at 0.50 kg in 220 l. Desiccant: Diquat at 0.60 kg ion in 220 l. Irrigation: 22 mm applied on two occasions.

Seed: Sown at 20 seeds per square metre.

Cultivations, etc.:- Ploughed: 1 Sept, 1989. Rolled: 4 Sept. Deep-tine cultivated: 24 Nov. Spring-tine cultivated, NPK applied: 12 Mar, 1990. Trifluralin applied and rotary cultivated: 14 Mar to **SOWDATE** 15 MAR, 4 Apr to **SOWDATE** 5 APR, 18 Apr to **SOWDATE** 18 APR, 30 Apr to **SOWDATE** 30 APR and 9 May to **SOWDATE** 10 MAY. Seed sown as **SOWDATE**. Rolled: 16 Mar to **SOWDATE** 15 MAR, 5 Apr to **SOWDATE** 5 APR, 18 Apr to **SOWDATE** 18 APR, 30 Apr to **SOWDATE** 30 APR and 10 May to **SOWDATE** 10 MAY. Linuron applied: 16 Mar to **SOWDATE** 15 MAR, 5 Apr to **SOWDATE** 5 APR, 19 Apr to **SOWDATE** 18 APR, 1 May to **SOWDATE** 30 APR and 10 May to **SOWDATE** 10 MAY. Irrigation applied: 3 and 25 May. Desiccant applied: 13 Aug to **VARIETY** S 47 **SOWDATE** 15 MAR, 22 Aug to **VARIETY** S 47 **SOWDATE** 5 APR and 18 APR, 29 Aug to **VARIETY** S 47 **SOWDATE** 30 APR and **VARIETY** SUNB 246 **SOWDATE** 15 MAR, 31 Aug to **VARIETY** S 47 **SOWDATE** 10 May, 5 Sept to **VARIETY** SUNB 246 **SOWDATE** 5 APR and 18 APR, 14 Sept to **VARIETY** SUNB 246 **SOWDATE** 30 APR and 26 Sept to **VARIETY** SUNB 246 **SOWDATE** 10 MAY. Hand harvested: 17 Aug **VARIETY** S 47 **SOWDATE** 15 MAR,

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Cultivations, etc.:-
29 Aug **VARIETY** S 47 **SOWDATE** 5 APR and 18 APR, 4 Sept **VARIETY** S 47 **SOWDATE** 30 APR and **VARIETY** SUNB 246 **SOWDATE** 15 MAR, 10 Sept **VARIETY** S 47 **SOWDATE** 10 MAY, 13 Sept **VARIETY** SUNB 246 **SOWDATE** 5 APR and 18 APR, 24 Sept **VARIETY** SUNB 246 **SOWDATE** 30 APR and 2 Oct **VARIETY** SUNB 246 **SOWDATE** 10 MAY. Previous crops: W. wheat 1988 and 1989.

NOTE: Plant heights and head diameters were measured and plants counted at maturity. Botrytis was assessed on ten occasions in late summer. Severely distorted and male sterile heads were counted.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

SOWDATE / **VARIETY**	15 MAR	5 APR	18 APR	30 APR	10 MAY	Mean
SUNB 246	2.91	3.11	3.30	3.48	3.53	3.27
S 47	0.83	1.72	2.01	2.39	2.26	1.84
Mean	1.87	2.41	2.66	2.93	2.89	2.55

*** Standard errors of differences of means ***

VARIETY	**SOWDATE**	**VARIETY SOWDATE**
0.039	0.062	0.088

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	18	0.107	4.2

GRAIN MEAN DM% 76.5

PLOT AREA HARVESTED 0.00150

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90/R/SU/2

SUNFLOWERS

ROW SPACINGS AND SEED RATES

Object: To study the effects of three row spacings and three seed rates on growth, disease and yield of sunflowers - Great Harpenden I.

Sponsors: V.J. Church, C.J. Rawlinson.

Design: 4 randomised blocks of 9 plots.

Whole plot dimensions: Wide and narrow rows: 3.0 x 10.0
Medium rows: 3.04 x 10.0.

Treatments: All combinations of:-

1. **ROW SPAC** Spacing between rows:

NARROW	25 cm
MEDIUM	38 cm
WIDE	50 cm

2. **POPULATN** Seeds sown per hectare:

80	80,000
120	120,000
160	160,000

NOTE: Plants were netted against birds from sowing until harvest.

Basal applications: Manures: (13:13:21) at 380 kg. Weedkillers: Trifluralin at 1.1 kg in 200 l. Linuron at 0.50 kg in 200 l. Desiccant: Diquat at 0.60 kg ion applied with a wetting agent, 'Vassgrow' at 0.22 l, in 220 l. Irrigation: 22 mm on each of two occasions.

Seed: Vincent.

Cultivations, etc.:- Ploughed: 1 Sept, 1989. Rolled: 4 Sept. Deep-tine cultivated: 24 Nov. Spring-tine cultivated, NPK applied: 12 Mar, 1990. Trifluralin applied, spring-tine cultivated twice: 24 Apr. Seed sown: 26 Apr. Linuron applied: 1 May. Irrigation applied: 3 and 25 May. Desiccant applied: 5 Sept. Hand harvested: 12 Sept. Previous crops: W. wheat 1988 and 1989.

NOTE: Plant heights and head diameters were measured and plants counted at maturity. Botrytis was assessed in late summer.

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90/R/SU/2

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

POPULATN	80	120	160	Mean
ROW SPAC				
NARROW	3.17	3.55	3.03	3.25
MEDIUM	3.25	3.28	2.85	3.13
WIDE	3.43	3.26	3.18	3.29
Mean	3.28	3.37	3.02	3.22

*** Standard errors of differences of means ***

ROW SPAC	POPULATN	ROW SPAC POPULATN
0.127	0.127	0.220

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	24	0.311	9.7

GRAIN MEAN DM% 76.3

PLOT AREA HARVESTED NARROW 0.00125
PLOT AREA HARVESTED MEDIUM 0.00114
PLOT AREA HARVESTED WIDE 0.00150

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90/R/SU/3

SUNFLOWERS

METHODS OF APPLYING FUNGICIDES

Object: To compare the effects of mist-blown and hydraulic applications of fungicide on the control of Botrytis and on the yield of sunflowers - Great Harpenden I.

Sponsors: V.J. Church, C.J. Rawlinson.

Design: 6 randomised blocks of 4 plots.

Whole plot dimensions: 3.5 x 10.0.

Treatments:

SPRAYER	Sprayers:
NONE	None
HYD	Standard hydraulic sprayer
HYD DLN	Hydraulic sprayer with drop leg nozzles
MIST BLO	Mist blower

NOTE: The sprayers applied carbendazim at 0.15 kg and prochloraz at 0.40 kg with vinclozolin at 0.75 kg in 440 l in HYD and MIST BLO and in 600 l in HYD DLN on 17 and 25 July, 1990.

NOTE: Plots were netted against birds from sowing until harvest.

Basal applications: Manures: (13:13:21) at 380 kg. Weedkillers: Trifluralin at 1.1 kg in 200 l. Linuron at 0.50 kg in 200 l. Desiccant: Diquat at 0.60 kg ion applied with a wetting agent, 'Vassgrow' at 0.22 l, in 220 l. Irrigation: 22 mm on each of two occasions and 25 mm on a third.

Seed: S47, sown at 16 seeds per square metre.

Cultivations, etc.:- Ploughed: 1 Sept, 1989. Rolled: 4 Sept. Deep-tine cultivated: 24 Nov. Spring-tine cultivated, NPK applied: 12 Mar, 1990. Trifluralin applied, spring-tine cultivated twice: 24 Apr. Seed sown, rolled: 25 Apr. Linuron applied: 1 May. Irrigation applied: 3, 25 May and 27 July. Desiccant applied: 29 Aug. Hand harvested: 4 Sept. Previous crops: W. wheat 1988 and 1989.

NOTE: Botrytis was assessed on four occasions during August. Plants were counted at harvest.

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90/R/SU/3

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

SPRAYER	NONE	HYD	HYD DLN	MIST BLO	Mean
	2.37	2.26	2.28	2.51	2.35

*** Standard errors of differences of means ***

SPRAYER
0.075

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.129	5.5

GRAIN MEAN DM% 79.0

PLOT AREA HARVESTED 0.00150

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90/R/SU/4

SUNFLOWERS

DIMETHIPIN AND MATURITY

Object: To study the effects of dimethipin and diquat on dates of maturity, amounts of disease and yield of sunflowers - Great Harpenden I.

Sponsors: V.J. Church, C.J. Rawlinson.

Design: 3 randomised blocks each containing 2 replicates of 3 treatments.

Whole plot dimensions: 3.5 x 10.0.

Treatments:

CHEMICAL	Chemical sprays:
NONE	None
DIMETHIP	Dimethipin at 0.50 kg in 220 l applied on 22 Aug, 1990
DIQUAT	Diquat at 0.60 kg ion applied with a wetting agent, 'Vassgrow' at 0.22 l, in 220 l, applied on 5 Sept

NOTE: Plots were netted against birds from sowing until harvest.

Basal applications: Manures: (13:13:21) at 380 kg. Weedkillers: Trifluralin at 1.1 kg in 200 l. Linuron at 0.50 kg in 200 l. Irrigation: 22 mm on each of three occasions.

Seed: Vincent, sown at 16 seeds per square metre.

Cultivations, etc.:- Ploughed: 1 Sept, 1989. Rolled: 4 Sept. Deep-tine cultivated: 24 Nov. Spring-tine cultivated, NPK applied: 12 Mar, 1990. Trifluralin applied, spring-tine cultivated, rotary cultivated, seed sown, rolled: 24 Apr. Linuron applied: 1 May. Irrigation applied: 3, 10 and 25 May. Hand harvested: 10, 13 and 18 Sept for **CHEMICAL** DIMETHIP, DIQUAT and NONE respectively. Previous crops: W. wheat 1988 and 1989.

NOTE: Samples were assessed for seed moisture content during flowering. Botrytis was assessed three times during late summer. Plants were counted at harvest.

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90/R/SU/4

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

CHEMICAL	NONE	DIMETHIP	DIQUAT	Mean
	2.71	2.51	2.67	2.63

*** Standard errors of differences of means ***

CHEMICAL
0.075

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	13	0.131	5.0

GRAIN MEAN DM% 80.8

PLOT AREA HARVESTED 0.00150

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90/R/LN/1

LINSEED

PESTS & DISEASES

Object: To study the effects of insecticidal and fungicidal treatments on the pests, pathogens and yields of linseed - Hoosfield.

Sponsors: A.W. Ferguson, B.D.L. Fitt.

Design: 6 randomised blocks of 4 plots.

Whole plot dimensions: 3.0 x 15.0.

Treatments: All combinations of:-

1. **INSCTCDE** Insecticides:

NONE	None
HC DE TR	Gamma HCH at 0.28 kg in 300 l on 11 Apr, 1990 and 25 Apr Deltamethrin at 7.5 g in 300 l on 11 Apr, 25 Apr, 9 May, 22 May, 11 July and 26 July Triazophos at 0.42 kg in 300 l on 5 June

2. **FUNGCIDE** Fungicides:

NONE	None
IP+PR+CM	Iprodione at 0.50 kg in 300 l on 14 June, 1990 Prochloraz at 0.50 kg in 300 l on 26 June Carbendazim at 0.25 kg and maneb at 1.6 kg in 300 l on 3 July Prochloraz (as seed dressing) at 0.40 g/kg seed

Basal applications: Manure: 'Nitram' at 250 kg. Weedkillers: Clopyralid at 0.10 kg with bentazone at 0.72 kg in 200 l. Desiccant: Diquat at 0.60 kg ion with a wetting agent ('Enhance' at 0.20 l) in 320 l.

Seed: Antares, sown at 90 kg.

Cultivations, etc.:- Ploughed: 4 Dec, 1989. N applied, spring-tine cultivated, rotary harrowed twice, seed sown: 22 Mar, 1990. Weedkillers applied: 14 May. Desiccant with wetting agent applied: 9 Aug. Combine harvested: 23 Aug. Previous crops: S. wheat 1988, linseed 1989.

NOTE: Insects and diseases were assessed regularly during he season.

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90/R/LN/1

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

FUNGCIDE	NONE	IP+PR+CM	Mean
INSCTCDE			
NONE	1.86	1.98	1.92
HC DE TR	1.85	2.07	1.96
Mean	1.86	2.03	1.94

*** Standard errors of differences of means ***

INSCTCDE	FUNGCIDE	INSCTCDE FUNGCIDE
0.037	0.037	0.052

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK	5	0.107	5.5
BLOCK.WP	15	0.091	4.7

GRAIN MEAN DM% 93.0

PLOT AREA HARVESTED 0.00276

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