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# Yields of the Field Experiments 1994

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## Sunflowers

### Rothamsted Research

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94/R/SU/1

SUNFLOWERS

VARIETIES & DISEASE

**Object:** To assess early maturing varieties of sunflowers and their susceptibility to *Botrytis cinerea* and other fungal diseases - Ex-allotments.

**Sponsors:** V.J. Church, H.A. McCartney.

**Design:** 4 randomised blocks of 6 plots.

**Whole plot dimensions:** 3.5 x 10.0.

**Treatments:**

**CULTIVAR**

345	SAM 345
348	SAM 348
AV	Avante
AL	Allegro
PAN	PAN 9405
AGC	AGC 92445

**Experimental diary:**

01-Nov-93 : B : Sting CT at 4.0 l in 200 l.  
06-Dec-93 : B : Ploughed.  
27-Apr-94 : B : Heavy spring-tine cultivated.  
28-Apr-94 : B : Rotary harrowed.  
29-Apr-94 : T : **CULTIVAR** 345, 348, AV, AL, PAN, AGC: Varieties, dressed, drilled at 14 seeds per m<sup>2</sup>.  
03-May-94 : B : 34.5% N at 145 kg.  
04-May-94 : B : Rolled.  
06-May-94 : B : Stomp 400 at 5.0 l in 200 l.  
20-May-94 : B : Decis at 300 ml in 200 l.  
13-Jun-94 : B : Laser at 2.25 l with Actipron at 1.8 l in 220 l.  
24-Aug-94 : T : **CULTIVAR** 345: Hand harvested, threshed by stationary combine.  
25-Aug-94 : T : **CULTIVAR** AV, AL, AGC: Reglone at 3.0 l with Vassgro Spreader at 0.44 l in 440 l.  
02-Sep-94 : T : **CULTIVAR** AV, AL, AGC: Hand harvested, threshed by stationary combine.  
22-Sep-94 : T : **CULTIVAR** PAN: Reglone at 3.0 l with Vassgro Spreader at 0.44 l in 440 l.  
                  : T : **CULTIVAR** 348: Hand harvested, threshed by stationary combine.  
29-Sep-94 : T : **CULTIVAR** PAN: Hand harvested, threshed by stationary combine.

Previous crops: W. wheat 1992, s. barley 1993.

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**NOTE:** Plant populations, growth stages, diseases and head size were monitored throughout the season, moisture content was measured prior to desiccation and grain density and oil content were measured after harvest.

**GRAIN (AT 90% DRY MATTER) TONNES/HECTARE**

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

**CULTIVAR**

345	2.41
348	3.15
AV	2.59
AL	2.63
PAN	3.35
AGC	2.68

Mean	2.80
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\*\*\* Standard errors of differences of means \*\*\*

**CULTIVAR**

0.189

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.267	9.5

GRAIN MEAN DM% 69.7

PLOT AREA HARVESTED 0.00150

94/R/SU/2

SUNFLOWERS

BOTRYTIS, HONEYBEES AND POLLEN BEETLES

**Object:** To determine whether visits by honeybees and pollen beetles to sunflower heads during flowering affects subsequent development of *Botrytis cinerea* - Long Hoos V 2.

**Sponsors:** J.R. Simpkins, N.L. Carreck, V.J. Church.

**Design:** 4 randomised blocks of 6 plots.

**Whole plot dimensions:** 2.74 x 2.74.

**Treatments:**

<b>BEE ADDN</b>	Presence of bees or pollen beetles and introduction of a bacterium ( <i>Bacillus subtilis</i> ) or fungicide (pyrimethanil) as a powder or spray:
-	None
B	Bees only
BB	Bees plus bacterium
P	Pollen beetles only
BF	Bees plus fungicide powder
F	No bees plus fungicide spray

**NOTE:** Bacterium and fungicide powder were mixed with talc and 'biobeads' for spreading by bees. Pyrimethanil was an experimental fungicide. Insect cages, each 2.74m x 2.74m, were placed on each plot.

**Experimental diary:**

08-Mar-94 : B : Ploughed.  
14-Mar-94 : B : Heavy spring-tine cultivated.  
17-Mar-94 : B : Heavy spring-tine cultivated.  
24-Mar-94 : B : Rolled.  
03-May-94 : B : 34.5% N at 145 kg.  
          : B : Rotary harrowed twice, Avante, dressed, drilled at 14 seeds per m<sup>2</sup>.  
04-May-94 : B : Rolled.  
06-May-94 : B : Stomp 400 at 5.0 l in 220 l.  
15-Jul-94 : T : **BEE ADDN** B, BB, BF: Honey bee colonies introduced.  
18-Jul-94 : T : **BEE ADDN** P: Pollen beetles introduced into cages.  
          : T : **BEE ADDN** BB, BF: Bacterium and fungicide powder respectively introduced each day until 03-Aug.  
20-Jul-94 : T : **BEE ADDN** F: Pyrimethanil spray at 4 kg in 220 l. plots.  
22-Jul-94 : B : Irrigated.  
25-Jul-94 : B : Irrigated.  
27-Jul-94 : B : Irrigated.  
02-Aug-94 : B : Irrigated.  
04-Aug-94 : T : **BEE ADDN** B, BB, BF: Honey bee colonies removed.  
06-Sep-94 : B : Reglone at 3.0 l with Vassgrow Spreader at 400 ml in 440 l.  
08-Sep-94 : B : Hand harvested, threshed by stationary combine.

94/R/SU/2

Previous crops: Mustard 1992, potatoes 1993.

- NOTES:** (1) Plots were netted against birds from after sowing to harvest. Irrigation for 1-2 hours on each occasion, was applied to increase disease spread. Plants were assessed for disease during the season and individual grain weights were measured.
- (2) The harvested seed was mixed in error on two plots, with the treatments P and BF. Estimated values were used in the analysis.

**GRAIN (AT 90% DRY MATTER) TONNES/HECTARE**

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

<b>BEE ADDN</b>	
-	1.94
B	1.78
BB	2.02
P	1.83
BF	1.82
F	1.77
Mean	1.86

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

<b>BEE ADDN</b>	
	0.190

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	13	0.269	14.5

GRAIN MEAN DM% \*

PLOT AREA HARVESTED 0.0001