

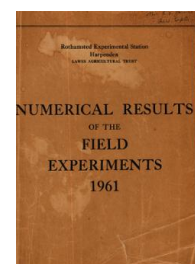
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Rothamsted Research

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61/B/10.1

WEEDKILLER CULTIVATION ROTATION

Great Harpenden I - 1961

A comparison of weed control by various cultivation methods and by a pre-emergence weedkiller.

Rotation: Winter beans, winter wheat, potatoes, barley.

Design: 2 randomised blocks of 12 plots each per crop, plots (except beans) being split into 2.

Area of each plot (acres): 0.048. Area harvested (acres):

<u>Whole plots</u>	- Beans - 0.00241
<u>Sub plots</u>	- Wheat and barley - 0.0114, potatoes - 0.0107

Treatments.

Whole plots: All combinations of:-

Cultivations to all crops: Ploughed (P); rotary cultivated (R);
tine cultivated (T).

Treatments to individual crops:

To beans: Normal cultivations (M); no cultivations after planting, simazine* applied - duplicate plots (X).

To wheat: Residuals of treatments to beans. All plots receive normal cultivations after planting.

To potatoes: Treatment M; treatment X; inter-row cultivations, then simazine* applied (Y).

To barley: Residuals of treatments to potatoes. All plots receive normal cultivations after planting.

In addition three plots per block are kept in reserve, receiving treatment PM and basal hormone spray to cereals for weed control.

Sub plots:

Potatoes: X plots split for final earthing up (E) v no final earthing up. M plots split for high (ME) v low ridges.

Barley and wheat: Plots split for hormone spray (H) v no hormone spray for weed control.

*At 1 lb active ingredient in 40 gallons per acre.

Basal dressings per acre:

✓ Beans: $3\frac{1}{2}$ cwt compound fertiliser (14% P_2O_5 , 28% K_2O) placement drilled.

X Wheat: $3\frac{1}{2}$ cwt compound fertiliser (16% N, 9% P_2O_5 , 9% K_2O) combine drilled.

✓ Potatoes: 12 cwt compound fertiliser (10% N, 10% P_2O_5 , 18% K_2O).

Barley: 3 cwt compound fertiliser (16% N, 9% P_2O_5 , 9% K_2O) combine drilled.

61/B/10.2

Operations in 1961: 1st year

Note: The rotation was modified -

Spring beans and spring wheat were sown instead of winter beans and winter wheat.

Treatments. All plots were ploughed.

P and T plots were tine cultivated and disced; except for the cereals, which were disced. (P)

R plots were rotary cultivated. (R)

Cultivations, etc.: All plots ploughed: Dec 28, 1960.

Spring beans: R plots rotary cultivated, remaining plots disced: Mar 22, 1961. P and reserve plots spring tine cultivated and disced, seed placement drilled at 200 lb per acre: Mar 23. All plots harrowed and rolled, X plots sprayed with simazine: Mar 24. M and reserve plots horse hoed: May 23. All plots machine hoed: May 26. Sprayed with demeton methyl at 12 fluid oz in 60 gallons per acre: June 26. Combine harvested: Sept 4. Variety: Tick.

Spring wheat: R plots rotary cultivated: Mar 22, 1961. Remaining plots disced three times: Mar 22 - 24. All plots harrowed, seed combine drilled at 3 bushels per acre, all plots harrowed: Mar 24. All plots rolled: Mar 25. Reserve plots and appropriate sub plots sprayed with CMPP at 6 pints in 40 gallons per acre: May 19. Combine harvested: Aug 30. Variety: Jufy I.

Potatoes: Disced (except R plots): Mar 22, 1961. Springtine cultivated (Except R plots): Mar 23, 27 and 28. All plots rolled: Mar 28. R plots rotary cultivated: Apr 13. Basal compound fertiliser applied: Apr 17. Springtine cultivated (except R plots): Apr 18. R plots rotary cultivated, remaining plots springtine cultivated, seed machine planted: Apr 19. Rolled, X plots sprayed with simazine: Apr 25. Chain harrowed (except X plots): May 16. Y plots grubbed and then ridged twice: May 30. Tractor weeded (excluding X and Y plots): June 2. Y plots sprayed with simazine: June 3. M and reserve plots grubbed: June 23 and again July 4. E sub plots of X plots grubbed: July 4. ME sub plots, E sub plots and reserve plots earthed up with high ridges: July 6. Remaining sub plots of PM and RM treatments earthed up: July 7. Sprayed with undiluted BOV at 15 gallons per acre: Sept 5. Lifted: Oct 3. Variety: Majestic.

Barley: R plots rotary cultivated: Mar 22, 1961. Remaining plots disced three times: Mar 22 - 24. All plots harrowed, seed combine drilled at 2 $\frac{1}{4}$ bushels per acre, all plots harrowed: Mar 24. All plots rolled: Mar 25. Reserve plots and appropriate sub plots sprayed with CMPP at 6 pints in 40 gallons per acre: May 19. Combine harvested: Aug 17. Variety: Proctor.

61/B/10.3

Standard error per plot.

Spring beans. Grain (at 85% dry matter): 2.79 cwt per acre or 14.9% (16 d.f.)

Spring wheat. Grain (at 85% dry matter)

Whole plot: 1.20 cwt per acre or 3.3% (18 d.f.)

Sub plot: 1.55 cwt per acre or 4.3% (21 d.f.)

Potatoes, total tubers:

Whole plot: 1.264 tons per acre or 10.3% (14 d.f.)

Sub plot: 0.485 tons per acre or 3.9% (19 d.f.)

Barley. Grain (at 85% dry matter)

Whole plot: 3.34 cwt per acre or 10.1% (18 d.f.)

Sub plot: 1.78 cwt per acre or 5.4% (21 d.f.)

Summary of Results

Spring beans

Grain (at 85% dry matter): cwt per acre

Treatment	Cultivation			Mean
	P	R	T	
M (± 1.97)	17.9	19.0	18.8	18.6 (± 1.14)
X (± 1.39)	18.9	19.7	17.7	18.8 (± 0.80)
Mean (± 1.14)	18.6	19.5	18.1	18.7

Reserve plots: 18.6 (± 1.14)

Mean dry matter % as harvested: 82.6

Spring wheat

Spray	Cultivation			Mean
	P	R	T	
		(± 0.66) ⁽¹⁾		
None	38.0	36.1	36.2	36.8
Hormone	35.8	34.2	34.4	34.8
Mean (± 0.49)	36.9	35.2	35.3	35.8
Diff. (± 0.90)	-2.2	-1.9	-1.8	-2.0 (± 0.52)

Reserve plots (FH): 36.0 (± 0.49)

Mean dry matter % as harvested: 86.0

(1) For use in horizontal and interaction comparisons

C1/B/10.4

Treatment	Potatoes			Mean	Not earthed up	Earthed up
	P	R	T			
	<u>Total tubers: tons per acre</u>				(1)	(2)
		(±0.893)		(±0.516)	(±0.198)	(±0.534)
M	10.40	12.85	13.44	12.23	12.54	11.91
X	11.91	11.26	12.16	11.78	11.83	11.72
Y	12.01	13.64	12.29	12.65		
Mean (±0.516)	11.44	12.58	12.63	12.22		

Reserve plots (PM): 12.57 (±0.516)

General mean 12.31

Treatment	Percentage ware (1½" riddle)				Not earthed up	Earthed up
	P	R	T	Mean		
M	95.3	95.8	94.9	95.3	94.8	95.8
X	95.4	96.8	95.3	95.8	95.9	95.7
Y	95.6	95.9	95.5	95.7		
Mean	95.4	96.1	95.2	95.6		

Reserve plots (PH): 95.5

General mean 95.6

Spray	Barley			Mean
	P	R	T	
		(±1.46) ⁽¹⁾		
None	30.6	34.4	33.4	32.8
Hormone	29.7	33.6	33.6	32.3
Mean (±1.36)	30.1	34.0	33.5	32.5
Diff. (±1.03)	-0.9	-0.8	+0.2	-0.5 (±0.59)

Reserve plots (PH): 34.6 (±1.36)

Mean dry matter % as harvested: 84.7

- (1) For use in horizontal and interaction comparisons
- (2) For use in vertical and diagonal comparisons