PLANT PROTECTION IN WHEAT — A SURVEY OF GROWER PRACTICES

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SUMMARY

After each of the seasons 1980-81, 1981-82 and 1982-83 approximately 150 wheat growers were surveyed, by personal interview, for information on management practices to minimize the losses caused by pests. Approximately 75% of the seed used was purchased as first or second generation seed, and most was treated with the fungicide combination triadimenol + fuberidazole. Triadimefon was the main fungicide applied to crops while MCPA either alone or in mixtures with other herbicides was the main chemical used for weed control. In general most crops were first year wheat, and stubble was burnt.

INTRODUCTION

For the last 7 years the Agricultural Economic Research Unit, Lincoln College (AERU) has conducted annual surveys of wheat growers to obtain information on the costs and returns for the wheat-growing enterprise. This information has assisted the wheat industry in developing economic policy.

For the last 3 years these surveys have obtained additional information on wheat with respect to management practices and pesticides to minimize losses caused by pests. Some of the salient results from these surveys are now presented.

MATERIALS AND METHODS

An initial survey form was designed in 1981, and used to obtain data from the 1980-81 season. This survey form was then redesigned, additional questions added, and was made suitable for computer storage of data and analysis.

Staff or persons employed by AERU conducted interviews on each farm property to obtain information on each wheat crop grown on the farm. Farms were selected at random in each of the major wheat growing regions, the numbers of each being in proportion to the total area of wheat in the region.

RESULTS AND DISCUSSION

Table 1 provides details on a number of management practices that are important from a plant protection point of view. The proportion of seed bought from outside sources was similar in all seasons. Wheat was grown mainly as a first year crop, with approximately 21% as a second crop, and 4% as a third. The figures are based on the total area in wheat on the farms surveyed. The majority of growers burnt the stubble but a number grazed with an increase in proportion grazed in the 1982-83 season.

All farmers who bought seed used treated seed while 90% of those who used their own, treated their seed. Table 1 provides data on the fungicides used on the wheat seed that was treated. This shows the increased use over the three seasons of triadimenol + fuberidazole, principally to achieve control of early infection with stripe rust (*Puccinia striiformis*). Table 2 shows the use of fungicides on seed of six cultivars in the 1981-82 season.

Table 3 shows that, in the 1981-82 season, the bought seed was principally first generation seed, whereas in the following season there was a greater use of second generation seed. This trend is indicated also by the own seed which in 1981-82 was mainly ex first generation, and in 1982-83 was ex second generation.

TABLE 1: Information on seed used, seed treatment, rotation and post-harvest stubble management of wheat in each of three seasons.

	1980-81	SEASON 1981-82	1982-83
No. farms in survey	142	150	144
No. crops in survey	210	191	218
Seed used	%	%	%
Bought	79	79	73
Own	21	21	27
Fungicide on seed treated			
triadimenol + fuberidazole	60.4	75.4	96.1
carboxin + thiram	31.4	20.3	2.9
captan	8.2	2.7	1.0
Rotation			
First year wheat	-	73.3	76.5
Second year wheat	-	21.3	20.4
Third year wheat	-	5.4	3.1
Post-harvest stubble management			
Burnt	-	83.2	64.5
Grazed	-	12.3	28.0
Surface worked	-	3.2	5.0
Deep ploughed	-	1.3	2.5

- Not recorded

TABLE 2: Percentage of seed of six wheat cultivars treated with different fungicides during the 1981-82 season

Fungicides	Cultivar					
	Karamu	Kopara	Tiritea	Oroua	Rongotea	Takahe
untreated	0	3	0	6	0	3
triadimenol + fuberidazole	63	73	100	82	66	80
carboxin + thiram	25	24	0	12	34	17
captan	6	0	0	0	0	0
unknown	6					
No. of crops	16	34	10	17	45	27

Table 4 shows that of the fungicides sprayed on wheat during crop growth, triadimefon was applied to most cultivars for stripe rust control. The table indicates that few crops of Karamu were treated, as this cultivar is resistant to stripe rust. Benomyl was used mainly on Takahe, a spring wheat in Southland where eyespot (*Pseudocercospora herpotrichoides*) control is often necessary.

Table 5 provides data on the main herbicides applied to wheat crops. In the 1980-81 season 27.1% of crops were not treated, and this figure had declined to 5.8% in the 1982-83 season. MCPA alone was the main herbicide applied, but triple mixes (including MCPA) were favoured, for in the 1982-83 season 27.1% were herbicides of this type.

TABLE 3: Percentage of different grades of wheat seed used during the 1981-82 and 1982-83 seasons, either bought or from own stocks.

Grade of Seed	Cultivars					
	Karamu	Kopara	Tiritea	Oroua	Rongotea	Takahe
1981-82 Season						
Bought						
Basic	6.6	0	2.8	0	2.4	0
First gen.	54.0	26.8	46.6	41.8	27.7	22.1
Second gen.	39.4	53.3	5.6	17.7	40.3	28.0
Uncertified	0	0	0	11.8	0	3.8
Own Seed Ex						
Basic	0	0	0	0	0	0
First gen.	0	11.5	45.0	15.5	14.0	36.0
Second gen.	0	4.5	0	11.4	4.7	9.3
Uncertified	0	3.9	0	1.8	10.9	0.8
1982-83 Season						
Bought						
Basic	2.2	0	7.8	0	1.0	0
First gen.	16.1	11.2	26.6	7.6	29.2	12.8
Second gen.	75.4	41.2	16.1	49.1	23.6	56.2
Uncertified	0	3.4	0	1.3	0	11.7
Own seed ex						
Basic	0	0	0	0	0	0
First gen.	0	10.7	9.5	14.1	4.2	0
Second gen.	0	5.3	40.0	22.4	22.4	7.1
Uncertified	6.3	28.2	0	5.5	19.6	12.2

TABLE 4: Number of crops of different wheat cultivars sprayed with different fungicides over the 1981-82 and 1982-83 seasons.

	Cultivar					
	Karamu	Kopara	Tiritea	Oroua	Rongotea	Takahe
1981-82						
Number of crops	16	34	10	17	45	27
Fungicide						
triadimefon	3	33	10	10	40	25
benomyl	1	6	3	0	1	17
propiconazole	0	0	0	0	0	0
1982-83						
Number of crops	27	35	10	48	40	25
Fungicide						
triadimefon	3	35	10	16	34	25
benomyl	0	9	3	5	0	15
propiconazole	0	1	1	0	0	1

TABLE 5: Percentage of wheat crops either untreated or treated with different herbicides during three seasons.

Herbicide applied	Season		
	1980-81	1981-82	1982-83
None	27.1	10.5	5.8
MCPA	22.4	20.0	22.9
MCPA + dicamba + mecoprop	10.5	10.5	12.0
MCPA + bromoxynil	0.5	3.5	6.5
MCPA + bromoxynil + 3,6 dichloropicolinic acid	6.7	10.5	4.5
MCPA + dicamba + dichlorprop	8.6	5.2	10.6
Chlorsulfuron	0	0	8.6
Others	24.2	39.8	29.1
	(100)	(100)	(100)
Total crops treated (once or more than once)	210	229	292

Other data obtained in the surveys showed that:

- (a) only approximately 10% of the farmers knew the size of seed used.
- (b) only a small number counted wheat emergence.
- (c) most of the crops were drilled into cultivated land.
- (d) take-all was regarded as not important. This may be a reflection of the ability of farmers to diagnose this disease.
- (e) herbicides were applied by ground equipment either by contractors or farmers.
- (f) fungicides were applied by either ground equipment or from the air, and again either by contractors or farmers. Full details are available on methods of application.
- (g) in general, insecticides were not used on wheat and when required were used for aphid or grass grub control.
- (h) in general problems did not occur during post-harvest storage.

The survey has been continued to obtain data from the 1983-84 season. It is intended to present data from all seasons in a detailed AERU publication.

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