Comparison of two formulations of Trifluralin

Peter Johnson (4th year La Trobe University student) and the BCG

The aim of this replicated trial was to compare the crop effect of two formulations of trifluralin – Triflur 480 (480 g/L active ingredient) and Crew (330 g/L active ingredient with slow release formulation). The work also included a demonstration of crop effect of trifluralin under dry- and wet sowing conditions.

Summary
The use of trifluralin as part of an integrated herbicide management program for the control of Group A resistant annual ryegrass populations has increased dramatically over the past decade. The requirement of incorporating Triflur 480 within 4 hours of application has imposed management issues during the busy sowing period, however, the advent of Crew (a slow release trifluralin formulation) offers greater management flexibility with an incorporation period of 24 – 48 hours.

In this replicated trial there is no difference between Triflur 480 and Crew on crop safety or yield regardless of incorporation time, incorporation method or product rate (average yield 1.9 t/ha).

Further information on trifluralin use and crop tolerance can be obtained in the 1998 – 2000/02 BCG Crop and Pasture Production Manuals

Background
With the increase in Group A resistant annual ryegrass populations trifluralin use has increased as part of an integrated herbicide management strategy. With the increase in use, farmers have looked for application methods that offer both better crop safety and savings in application and incorporation time. The advent of Crew, a slow release trifluralin formulation, offers farmers the ability to apply Crew up to 24-48 hours before sowing without incorporation. The slow release formulation also provides greater crop safety and longer residual as the high peaks of activity are avoided.

Methods
This trial was conducted using a fully replicated randomised block design.

The replicated trial was dry sown on 23 May 2001 with Yitpi wheat (80 kg/ha). The wet sown demonstration was sown 18 June 2001. All treatments were fertilised with 40 kg/ha Urea pre-drilled and 80 kg/ha Mallee Mix 1 with the seed.

The site was mechanically fallowed and no large clods were present. The sowing operation was conducted using narrow points with Auspoint press harrows trailing. Post emergent weed control was conducted with normal applications of registered products.

The trial treatments applied were:
- Triflur 480 at 0.8 L/ha applied and incorporated with harrows 7 days prior to sowing (the conventional way to use trifluralin)
- Triflur 480 at 1.2 L/ha applied in front of seeder and incorporated by sowing (IBS)
- Crew at 1.8 L/ha applied in front of seeder and IBS
- Crew at 1.2 L/ha applied 48 hr prior to sowing and IBS
- Crew at 1.8 L/ha applied 48 hr prior to sowing and IBS

Demonstration included:

- Triflur 480 at 1.2 L/ha applied in front of seeder and IBS – wet soil
- Crew at 1.8 L/ha applied in front of seeder and IBS – wet soil
- Crew at 1.2 L/ha applied 48 hr prior to sowing and IBS – wet soil
- Crew at 1.8 L/ha applied 48 hr prior to sowing and IBS – wet soil

Crop emergence was monitored and all plots were harvested to establish yield and grain quality for each treatment.

Results

There was no significant effect of any herbicide treatments on plants emerged, plants that failed to emerge or grain yield (Table 1).

Table 1: Crop emergence and yield performance for Yitpi wheat treated with two different trifluralin formulations and a range of application timings and incorporation methods under dry- and wet-sowing conditions.

Treatment				Emerged (plts/m^2)	Non - emerged (plts/m^2)	Yield (t/ha)
Product	**Rate (L/ha)**	**Timing**	**Incorporation**			
Triflur 480	0.8	7 days prior	Harrowed	226	11	1.9
Triflur 480	1.2	In front seeder	IBS	231	18	2.0
Crew	1.8	In front seeder	IBS	212	20	1.8
Crew	1.2	48 hrs prior	IBS	249	9	2.0
Crew	1.8	48 hrs prior	IBS	220	13	1.9
Significance difference				**NS**	**NS**	**NS**
Wet sown demonstration						
Triflur 480	1.2	In front seeder	IBS	198	12	2.3
Crew	1.8	In front seeder	IBS	192	13	2.3
Crew	1.2	48 hrs prior	IBS	189	11	2.0
Crew	1.8	48 hrs prior	IBS	177	14	2.2

Interpretation

In this replicated trial there is no difference between Triflur 480 and Crew on crop safety or yield regardless of incorporation time, incorporation method or product rate (average yield 1.9 t/ha).

The dry soil conditions that prevailed would have minimised any volatilisation losses that may have occurred if soil conditions were moist and warm.

In the wet sown demonstration the average yield of all treatments was 2.2 t/ha. There was no difference between Triflur 480 at 1.2 L/ha or Crew at 1.8 L/ha when applied in front of the seeder and incorporated by sowing. This method of application, had a slightly higher yield than Crew applied 48 hours before sowing and then incorporated by sowing – Crew 1.2 L/ha yielded 2.0 t/ha and Crew 1.8 L/ha yielded 2.2 t/ha.

Commercial Practice
The use of trifluralin as part of an integrated herbicide management program for the control of Group A resistant annual ryegrass populations will continue.

The advent of Crew, a slow release trifluralin formulation, will allow greater flexibility at sowing and may deliver higher crop safety. It should be noted however, that physical separation of the wheat seed and trifluralin band is the major factor leading to crop safety with any trifluralin formulation.

The manufacturer, Nufarm, claims:

- Crew delivers that same level of weed control when incorporated 24 hours after application as Triflur 480 when incorporated immediately,
- Crew has higher crop safety than Triflur 480 as there is no rapid peak in activity owing to its slow release formulation, meaning higher rates may be applied with minimal damage to the crop whilst improving weed control, and
- The controlled release formulation of Crew gives greater residual activity on later germinating weeds.

Further information on trifluralin use and crop tolerance can be obtained in the 1998 – 2000/02 BCG Crop and Pasture Production Manuals