

DEVELOPMENT OF 'COMODOR' (72% TEBUTAM*) IN THE U.K. FOR
PRE-EMERGENCE WEED CONTROL IN WINTER OILSEED RAPE

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Summary

Initial trials (1978) showed 2.9 kg/ha tebutam to be insufficient. At 4.3 kg/ha, results, particularly of volunteer cereal control, were too erratic and lacked the consistency required of a commercial product. This was overcome by the inclusion of TCA used in sequence or tank-mix which also enabled a reduction in rate to 3.6 kg/ha. Further work (1979/1980) resulted in a choice of application timing depending on cultural method. Current work compares tebutam + TCA (pre-emergence) with tebutam (pre-emergence) followed by post emergence herbicides such as fluazifop-butyl or alloxym-sodium.

Although we first conducted trials with tebutam (formerly butam) in 1976 on a range of spring sown crops, it was not until 1978 that we began a full development programme for its pre-emergence use on winter oilseed rape. Preliminary trials the previous year had indicated a likely application rate of 4.3 kg ai/ha, but having learned early in 1978 that tebutam was then already being marketed in France at 2.9 kg/ha, we laid down a series of replicated trials in which we compared the effects of tebutam at 2.9, 3.6 and 4.3 kg/ha and in view of the widespread popularity of TCA, we included a treatment comprising 2.9 kg/ha tebutam tank-mixed with 7.4 kg/ha TCA. In addition to the replicated trials, we arranged a total of some 23 farm sites on which the co-operating farmers, using their own equipment, compared tebutam at 2.9 and 4.3 kg/ha. The latter were widely distributed throughout England and were assessed by recording the numbers of individual weed species/m² by means of quadrat counts.

* proposed common chemical name

Our results (not here presented) showed 2.9 kg/ha to be insufficient under U.K. conditions, probably because of basic differences in the cultural techniques practised respectively in the U.K. and France.

In France, land destined for winter oilseed rape is usually ploughed and cultivated prior to drilling. In the U.K., this seldom happens. Either the crop is drilled direct into the stubbles after the preceding cereal crop has been harvested (direct drilling) or, more commonly, a minimal amount of cultivation is undertaken prior to drilling (minimal cultivations). The French régime of ploughing buries any weed seeds which results either in a partial kill or the weakening of any surviving weed seedlings thus enabling a lower rate of application than we found is necessary in the U.K.

Our results also indicated that the tank-mix of tebutam and TCA greatly improved the control of monocotyledonous weeds and thus warranted further and more detailed investigation.

Table I

Effect of tebutam with and without TCA
Mean of 4 trials (1979/80)

	1 month	3 months	3/7 months
	Plant no's/m ²		% weed cover
Untreated	140.6	137.6	5.5
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Tebutam + TCA	Percentage control		
l/ha kg/ha			
- 7.4	60	68	31
3.6 + -	38	59	71
3.6 + 7.4	21	82	71
3.6 + 10.4	67	95	82
4.3 + -	33	43	56

Adapted from Spencer-Jones (1980).

Accordingly, the following year, we investigated in greater detail the effect on volunteer cereals of tebutam with and without TCA which was applied at two rates. These results which have been reported by Spencer-Jones (1980) showed that not only was a consistently high level of control obtained from the higher rate of TCA

but that the rate of tebutam could be reduced to 3.6 kg/ha if the two chemicals were used in conjunction, either in tank-mix or in sequence. (Table I).

Blair and Nyffeler (1978) have shown that ash from burned stubbles reduces the efficacy of certain herbicides against Alopecurus myosuroides.

We investigated this aspect in our 1979/80 programme and found this was not the case with tebutam. We also observed that weed control that season was somewhat better when tebutam was applied before, rather than after cultivating. (Table II).

Table II

Effect of soil incorporation on the control of volunteer cereals

Timing	Plant no's/m ² Untreated	% control	
		Tebutam 4.3	Tebutam + TCA 4.3 + 7.4
Sprayed before cultivating	53	79	94
Sprayed after cultivating	57	65	86

Adapted from Spencer-Jones (1980).

These findings led to a further series of trials in 1980/81 and 1981/82 for an investigation of the effect of different timings of application in which tebutam was applied either before or after cultivating and also after drilling.

Table III

Effect of timing of application

	Untreated Plant no's/m ²	Tebutam + TCA Pre- cultivation	% control Post cultivation	Post drilling
1980/81 (Mean of 3 trials)				
Volunteer cereals and grasses	101.7	95	95	97
Broadleaved weeds	132.7	84	75	91
Total	234.4	89	85	94
1981/82 (Mean of 4 trials)				
Volunteer cereals and grasses	102.6	95	97	97
Broadleaved weeds	29.1	74	81	88
Total	131.7	90	93	95

In comparison with the very dry conditions of 1979 the autumns of the two following years were contrastingly wet and it will be seen from Table III that under these conditions, higher levels of weed control were obtained when tebutam was applied post drilling.

Results from the work thus far reported enabled us to draw up commercial recommendations which have now been approved under the Agricultural Chemicals Approval Scheme. These are:-

1. That tebutam be applied at 3.6 kg/ha either in tank-mix or in sequence with TCA at 10.4 kg/ha, to provide a consistently high level of control of volunteer cereals, of Avena fatua and of annual grasses. This combination also controls a wide spectrum of broad-leaved weeds.
2. In terms of timing, application should be made post drilling but before crop or weed emergence to ploughed, uncultivated or minimally cultivated sites under normal conditions of soil moisture. Under dry conditions however, weed control will be improved if

tebutam and TCA are lightly incorporated or, if applied in conjunction with minimal cultivations, then just before cultivating.

Because TCA is both cheap and highly effective in its control of volunteer cereals and grasses, it is still very widely used in the U.K. Gladders (1982) has reported that the pre-emergence application of TCA, alone or in combination with other herbicides, consistently increased the incidence of leaf and stem infections of Leptosphaeria maculans and of Phoma leaf spot and canker due to its de-waxing effect. Pre-emergence tebutam on the other hand, when applied alone, had no significance on disease incidence. Recognising the importance of Gladders' findings, progressive growers are now looking towards effective alternatives to TCA such as fluazifop-butyl or alloxym-sodium, both of which are applied post emergence.

In consideration of Gladders' findings and with a view to widening our label recommendations, we commenced a series of trials in 1982 in which we are currently comparing the effects of tebutam applied pre-emergence at 3.6 kg/ha with and without TCA with tebutam pre-emergence followed by either fluazifop-butyl or alloxym-sodium applied over a range of rates.

Table IV

Comparison of tebutam with pre-emergence
TCA and other post emergence herbicides
Mean of 6 trials (1982/83)

	Untreated Plant no's/m ²	Percentage control			
		T1	T2	T3	T4
Volunteer cereals	5.3	96	96	100	100
Annual grasses	33.6	95	99	98	97
Broadleaved weeds	20.3	78	81	58	63

T1. Pre-emergence tebutam 3.6 kg/ha.

T2. As T1 above + pre-emergence TCA 10.4 kg/ha.

T3. As T1 above + post emergence fluazifop-butyl 250 g/ha.

T4. As T1 above + post emergence alloxym-sodium 750 g/ha.

Our results (Table IV) when trials were assessed approximately six months after the pre-emergence treatments and 4-5 months after the post emergence treatments show the control of volunteer cereals and of annual grasses provided by both fluazifop-butyl and alloxym-sodium to be equal or better than that from TCA thus indicating that they could be used to replace TCA if the grower so wished.

In view of the fact also that these treatments produced no evidence of any crop phytotoxicity, these encouraging results, if reflected in further work should enable a widening of our current tebutam recommendations so to provide even greater flexibility for this very effective herbicide.

REFERENCES

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