

## BENTAZONE (172)

Bentazone was first reviewed by the 1991 JMPR. At the 25th (1993) Session of the CCPR (ALINORM 93/24A para 193) it was agreed that there was a need to review the information on GAP as it was inadequately reported in the 1992 Residue Evaluations. The following additional points were raised.

France and The Netherlands suggested an MRL of 1 mg/kg for alfalfa forage, and believed that the proposed MRL of 3 mg/kg on maize fodder was not supported by the data in the 1991 residue evaluations.

Germany indicated that German GAP required higher MRLs for dry beans, common beans, field peas and garden peas, and was requested to provide written comments. The USA requested an increase in the proposed MRL on dry peas from 0.05 to 1.0 mg/kg.

The Netherlands preferred an MRL of 0.05\* mg/kg for potato and, supported by the USA, an MRL of 0.05\* mg/kg for rice.

Germany queried the fact that the reported limit of determination was lower than the sum of the limits of determination of the three components of the residue.

In order to respond to these questions the Meeting considered the information provided in the 1991 evaluation as far as the condensed and summarized presentation made it possible.

In response to the CCPR discussion, (1) the manufacturer provided detailed information on GAP, results of supervised trials on peas to support the US request to increase the MRL for dry peas, and a residue analytical method for peas; (2) Germany sent written comments on the commodity description of field beans and provided a summary of two trials on rye; (3) Norway and Spain provided information on current use patterns. In addition, Australia informed the Meeting about their present national MRLs.

### METHODS OF RESIDUE ANALYSIS

The method described in the 1991 evaluation has been modified to include other seed and pod vegetables. Following the extraction with methanol and hydrolysis in methanolic HCL, the hydrolysate is evaporated to near dryness and dissolved in water. The pH is adjusted to 8.5-9.0 and the solution is extracted with chloroform, acidified to pH 1 and extracted with ethyl acetate. The ethyl acetate is evaporated and the residue methylated with diazomethane and cleaned up on a Florisil column.

The derivatives (*N*-methyl-bentazone, 6-methoxy-*N*-methyl-bentazone and 8-methoxy-*N*-methyl-bentazone) are determined by GLC on an SE-30, OV-17 or HI-EFF liquid phase with an FPD in the sulphur mode. The LOD was reported to be 0.05 mg/kg (Horton and Huber, 1977).

**USE PATTERN**

Detailed information on national use patterns is given in Table 1.

Table 1. Registered uses of bentazone.

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
Alfalfa	Algeria	SL 480	1.44		1	
	Bulgaria	SL 480	1.44			
	Croatia	SL 480	1.44			63
		SL 600	1.50			42
	Cyprus, Greece	SL 480	1.44			
	Czech Republic Slovak Republic	SL 480	1.92			a <sup>1</sup>
		SL 600	1.92			a
	Ecuador	SL 480	1.44	0.48	1	
	Greece	SL 480	1.20			
	Macedonia	SL 480	1.44			63
		SL 600	1.50			42
	Morocco	SL 480	0.96			
	Spain	SL 480	1.92			
	Sweden	SL 480	1.44	0.48	1-2	
	Switzerland	SL 480	1.44			21
Yugoslavia	SL 480	1.44			63	
	SL 600	1.50			42	
Asparagus	Argentina	SL 480	0.96	0.38	1	30
		SL 600	0.96		1	30
Barley	Belgium	SL 333	1.0			a
	Bolivia	SL 480	0.96		1	
	Chile	SL 480	1.20		1	2
	Colombia	SL 480	1.44	0.72	1	
	Ecuador	SL 480	1.20	0.40	1	
	Greece	SL 480	1.20			
	Italy	SL 480	1.92			60
		SL 250	1.00	0.33		60
		SC 12.6%	1.01	0.34	b <sup>1</sup>	
	Korean Republic	SL 480	1.92	1.92	b	
Luxembourg	SL 333	0.99	0.50	b	a	
Spain	SL 333	1.00			15	
Barley, Summer	Belgium	SL 333	0.75			a
		SL 250	0.60	0.30	1	a

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
	France	WP 50%	1.25			
		SL 480	1.20			
		SL 260	1.04			
		SL 333	0.99			
	Germany	SL 250	0.75		1	b
	Ireland	SL 200	1.30	0.65	1	a
	UK	SL 200	1.30	0.65	1	a
Barley, Winter	Belgium	SL 333	0.75			a
	France	WP 50%	1.25			
		SL 480	1.20			
		WP 50%	1.25			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			
		SC 100	0.70			
	Germany	SL 333	0.99		1	b
		SL 250	0.75		1	b
	Italy	SL 260	1.04	0.34	1	
	Netherlands	SL 333	0.99	0.25	1	a
Bean	Belgium	SL 480	0.96			a
	Bolivia	SL 480	0.96	0.32		
	Bulgaria	SL 480	1.44		1	
	Canada	SL 480	0.84	0.27	1-2	9
	Chile	SL 480	1.20			2
	Croatia	SL 480	1.20			42
		SL 600	0.90			42
	Spain	SL 480	1.92			
	Sweden	SL 480	1.44	0.48	1-2	
Bean, Adzuki	Argentina	SL 480	0.96	0.38	1	30
Bean, Broad	Cyprus, Greece	SL 480	2.06			
	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Denmark	SL 480	1.44		1	42
	France	SL 480	1.20			
	Greece	SL 480	1.20			
	Hungary	SL 480	1.44	0.57		
	Ireland	SL 480	1.44	1.44	1	a
	Israel	SL 48				
	Japan	SL 40 %	0.28			a

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
	Luxembourg	SL 480	1.20	0.60	1	a
	Macedonia	SL 480	1.20			42
		SL 600	0.90			42
	Mozambique	SL 480				
	UK	SL 480	1.44	1.44	1	a
	USA	SL 42 %	0.98	0.52	1-2	30
	Yugoslavia	SL 480	1.20			42
		SL 600	0.90			42
Bean, Climbing French	Canada	SL 480	1.08	0.27	1-2	9
	Ecuador	SL 480	1.20	0.40	1	
Bean, Dwarf French	Canada	SL 480	1.08	0.27	1-2	9
	Costa Rica	SL 480	0.96			
	Cyprus, Greece	SL 480	2.06			
	Ireland	SL 480	1.44	1.44	1	a
	Japan	SL 40 %		0.28	1	a
	UK	SL 480	1.44	1.44	1	a
	Switzerland	SL 480	0.72			
Bean, Fava	Canada	SL 480	0.84-1.08		2	
Bean, Field	Germany	SL 480	0.48		1-2	b
	Greece	SL 480	1.20			
	Ireland	SL 480	1.44	1.44	1	a
	UK	SL 480	1.44	1.44	1	a
Bean, Horse	Austria	SL 480	1.44	0.48	1	42
	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
Bean, Lima	Canada	SL 480	1.08	0.27	1-2	9
Bean, Scarlet Runner	Ireland	SL 480	1.44	1.44	1	a
	UK	SL 480	1.44	1.44	1	a
Bulb vegetables	Angola	SL 480	1.44	0.72	1	
Cereals	Algeria	SL 480	1.92		1	
		SL 260			1	
	Austria	SL 260	1.04	0.52	1	
		SC 150	0.90			a
		SL 208	1.04			
		SL 150	0.6 - 0.75			
	Belgium	SL 480	1.20			a
	Croatia	SL 480	1.92			
		SL 600	1.80			63
		SL 260	1.04			

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
	Cyprus, Greece	SL 480	2.06			
	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Denmark	SL 480	1.44		1	42
		SL 260	1.04		1	42
		SL 250	1.00		1	42
		SL 150	0.75			42
	Germany	SL 333	0.99		1	b
		SL 250	0.75		1	b
	Greece	SL 260	1.04			
	Ireland	SL 250	1.38			a
	Luxembourg	SL 480	1.20	0.60	1	a
	Macedonia	SL 480	1.92			
		SL 600	1.80			63
		SL 260	1.04			
	Sweden	SL 480	1.44	0.48	1-2	
		SL 208				
	Switzerland	SL 480	1.92			
		SL 21.6 %	0.86			
	Tunisia	SL 500	2.00	0.66	1	
	Yugoslavia	SL 480	1.92			
		SL 600	1.80			63
		SL 260	1.04			
	Zimbabwe	SL 480	2.40			
Cereals, Autumn planted	Switzerland	SL 250	0.75			
Cereals, Spring planted	Germany	SL 480	0.96		1	b
	Netherlands	SL 333	0.74	0.18	1	a
	Switzerland	SL 250	0.75			
	USA	SL 42 %	0.98	0.52	1-2	105
Clover	Algeria	SL 480	1.44			
	Cyprus, Greece	SL 480	1.44			
	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Egypt.	SL 480	1.68	0.19	b	
	Sweden	SL 480	1.44	0.48	1-2	
Clover, Red	Switzerland	SL 480	1.44			21
	Czech Republic Slovak Republic	SL 480	1.92			a
		SL 480	1.92			a

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
		SL 600	1.92			a
	Ecuador	SL 480	1.44	0.48	1	
	Spain	SL 480	1.92			
Clover, White	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Ecuador	SL 480	1.44	0.48	1	
Corn, Sweet	Canada	SL 480	1.08	0.27	1-2	9
	France	SL 480	1.20			
		SC 200	0.80			
Cucumber	Sweden	SL 480	1.44	0.48	1-2	
Field crops	Saudi Arabia	SL 250	1.25	0.32	1	
Flax	Argentina	SL 480	0.96	0.38	1	7
	Bulgaria	SL 480	1.44		1	
	Canada	SL 480	1.08	0.27	1-2	9
	Chile	SL 480	1.44			2
	Croatia	SL 480	1.92			63
	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Denmark	SL 480	1.20-1.44		1	42
	France	SL 480	1.20			
	Greece	SL 480	1.20			
	Hungary	SL 480	1.92	0.76		
	Iraq	SL 480	2.52	0.63	1	
	Ireland	SL 480	1.44	1.44	1	a
	Luxembourg	SL 480	1.20	0.60	1	a
	Macedonia	SL 480	1.92			63
	Sweden	SL 480	1.44	0.48	1-2	
	Tunisia	SL 480	0.96	0.32		
	UK	SL 480	1.44	1.44	1	a
	Yugoslavia	SL 480	1.92			63
	Canada	SL 480	1.08	0.27	1-2	9
	Chile	SL 480	1.44			2
	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Iraq	SL 840	2.52	0.63	1	
	Ireland	SL 480	1.44	1.44	1	a
	Sweden	SL 480	1.44	0.48	1-2	
Flax, Common	Rumania	SL 480	1.92			

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
Fodder crops, pastures	Denmark	SL 480	1.44		1	42
		SL 260	1.04		1	21
		SL 250	1.00		1	21
Fodder, legume	Argentina	SL 480	0.96	0.38	1	7
	Israel	SL 48%	0.72			
	Tunisia	SL 480	0.96	0.32		
Fruit trees	Argentina	SL 480	1.44	0.58		
Garlic	Bulgaria	SL 480	0.96			
Grass Seed	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Denmark	SL 260	1.04		1	
		SL 250	1.00		1	
Legumes	Sweden	SL 250	1.00	0.33	1-2	
	Tunisia	SL 480	0.96	0.32		
	UK	SL 480	1.44	1.44	1	a
Lily, Yellow	Ireland	SL 480	1.44	1.44	1	
	UK	SL 500	1.50	1.50	1	
Maize	Angola	SL 480	1.44	0.72	1	
		SL 200	0.80	2.67	1	365
	Argentina	SL 480	0.96	0.38	1	7
		SL 600	0.96		1	7
		SC 200	0.80	0.40	1	7
		SL 48%	1.2	0.60		
	Austria	SC 200	1.0			120
	Belgium	SL 480	1.44	0.72	1	a
		SC 200	0.70		1-2	a
		SL 250	0.75	0.38	1	a
Bolivia	SL 480	0.96	0.32	1		
Bulgaria	SC 200	0.80				
Canada	SC 200	0.84-1.68	0.20	1	9	
Chile	SL 480	1.44				
	SC 200					
Costa Rica	SL 480	1.20				
Croatia	SL 480	0.96-1.92			63	
Denmark	SC 200	0.80			90	
	Ecuador	SL 480	1.92	0.96	1	
France	SL 480	1.20-1.44				
		SC 200	0.80			15

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
		SC 300	0.75			
	Greece	SL 480	1.20			
	Hungary	SL 480	1.68	0.84	1	
	Italy	SL 480	1.68			60
		SL 400	1.40			20
		SC 200	0.90	0.30		
	Japan	SL 40 %	0.60			a
	Luxembourg	SL 480	0.96-1.44	0.48	1	a
	Macedonia	SL 480	1.92			63
		SL 480	0.96			63
		SC 200	1.00			63
	Malaysia	SL 396	1.58			
	Mozambique	SL 480				
	Rumania	SL 200				
	South Africa	SC 200	1.00	0.33	1-2	
	Spain	SL 200	0.90			15
	Sweden	SL 250	1.00	0.33	1-2	
		SL 480	1.44	0.48	1-2	
	Switzerland	SC 25.5 %	1.02			b
		SL 480	0.96			
		SC 200	0.80			
	USA	SL 42 %	0.98	0.53	1-2	b
	Yugoslavia	SL 480	0.96-1.92			63
	Zimbabwe	SL 480	1.44			
Millet, Sorghum	Bolivia	SL 480	0.96	0.32		
	Ecuador	SL 480	1.92	0.96	1	
	France	SC 200	0.80			
	Greece	SL 480	1.20			
	Mozambique	SL 480				
	South Africa	SC 200	1.00	0.33	1-2	
Oats	Argentina	SL 26	0.91	0.61	1	7
	Belgium	SL 333	0.75			a
	Bolivia	SL 480	0.96		1	
	Chile	SL 480	1.20		b	2
	France	SL 480	1.20			
	Germany	SL 250	0.75		1	b
	Greece	SL 480	1.20			
	Italy	SL 480	1.92			60
		SL 260	1.04	0.34	1	
		SL 250	1.00	0.33		60



Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
	Luxembourg	SL 333	1.00	0.50	b	a
	Spain	SL 333	1.00			15
Oats, Summer	Belgium	SL 250	0.60	0.30	1	a
	France	WP 50 %	1.25			
		WP 50 %	1.25			
		SL 480	1.20			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			
	Ireland	SL 200	1.30	0.65	1	a
	UK	SL 200	1.30	0.65	1	a
Oats, Winter	Belgium	SL 333	0.75			a
		SL 250	0.68	0.34	1	a
	France	WP 50 %	1.25			
		SL 480	1.20			
		WP 50 %	1.25			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			
Onion	Argentina	SL 480	1.44	0.58	1	30
		SL 600	0.96-1.44		1	30
	Bulgaria	SL 480	0.96			
	Costa Rica	SL 480	0.96			
	Cyprus, Greece	SL 480	2.06			
	Ecuador	SL 480	1.44	0.48	1	
	El Salvador	SL 480	0.96			
	Israel	SL 480	0.72	0.18		
	Japan	SL 40 %	0.48			
Pea	Austria	SL 480	1.44	0.48	1	42
	Belgium	SL 480	0.96			a
	Bulgaria	SL 480	0.72-1.20			
		SL 400	1.20			
	Canada	SL 480	0.84-1.08	0.27	1-2	9
	Chile	SL 480	1.20			2
	Colombia	SL 480	1.20	0.60	1	
	Croatia	SL 480	0.96-1.92			42
		SL 600	1.50			42
	Cyprus, Greece	SL 480	2.06			
	Czech Republic Slovak Republic	SL 480	1.44			a

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
		SL 600	1.44			a
	Denmark	SL 480	1.44		1	42
		SL 250	0.50		1	42
	Ecuador	SL 480	1.20	0.40	1	
	France	SL 480	1.20			
		SL 200	0.80	0.35	1	a
	Greece	SL 480	1.20			
	Hungary	SL 480	1.44	0.57		
	Ireland	SL 480	1.44	1.44	1	a
		SL 200	0.80	0.35	1	a
	Israel	SL 480	0.96	0.48		
	Italy	SL 480	1.68	0.48		30
	Luxembourg	SL 480	1.44		1	a
	Macedonia	SL 480	0.96-1.92			42
		SL 600	1.50			42
	UK	SL 480	1.44	1.44	1	a
	Spain	SL 480	1.92			
	Sweden	SL 480	1.44	0.48	1-2	
	Switzerland	SL 480	1.92	0.38		
	Yugoslavia	SL 480	0.96-1.92			42
		SL 600	1.50			42
	Zimbabwe	SL 480	1.44			
Pea, Field	Germany	SL 480	0.96		1	40
Pea, Garden	Argentina	SL 480	0.96	0.38	1	30
		SL 600	0.96		1	30
	Bolivia	SL 480	0.96	0.32		
	Bulgaria	SL 480	1.44		1	
	Costa Rica	SL 480	0.96			
	Germany	SL 480			1	40
	USA	SL 42 %	0.98	0.52	1-2	30
Peanut	Angola	SL 480	1.44	0.72	1	
	Argentina	SL 480	0.96	0.38	1	30
		SL 600	0.96		1	30
	Bolivia	SL 480	0.96			
	Bulgaria	SL 480	1.92			
	Canada	SL 480	1.08	0.27	1-2	9
	China	SL 480				
	Costa Rica	SL 480	0.96			
	Cyprus, Greece	SL 480	1.44			
	Ecuador	SL 480	0.96	0.32	1	

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
	Greece	SL 480	1.20			
	Israel	SL 480	2.40	0.60		
	Malaysia	SL 396	1.58			
	Mozambique	SL 480				
	Spain	SL 480	1.92			
	USA	SL 42 %	0.98	0.52	1-2	b
		SL 28.5 %	0.51	0.27	1-2	75
	Zimbabwe	SL 480	1.68			
Peppermint	USA	SL 42.00%	1.96	1.05	1-2	9
Potato	Argentina	SL 480	0.96	0.38	1	30
		SL 600	0.72-0.96		1	30
	Austria	SL 480	1.44	0.48	1	42
	Belgium	SL 480	0.96			a
	Costa Rica	SL 480	1.44			
	Croatia	SL 480	1.44			42
		SL 600	1.20			42
	Czech Republic Slovak Republic	SL 480	1.44			a
	Germany	SL 480	0.96		1	42
	Ireland	SL 480	1.44	1.44	1	a
	Luxembourg	SL 480	0.96		1	a
	Macedonia	SL 480	1.44			42
		SL 600	1.20			42
	Norway	SL 480			1	
	Rumania	SL 480	1.44			
	Spain	SL 480	1.92			
	Sweden	SL 480	1.44	0.48	1-2	
	Switzerland	SL 480	0.96			
	UK	SL 480	1.44	1.44	1	a
	Yugoslavia	SL 480	1.44			42
		SL 600	1.20			42
Rice	Angola	SL 480	1.44	0.72	1	
		EC 160	1.6	4.57	1	
	Argentina	SL 600	0.84-1.2		1	30
		SL 339	1.02	0.51	1	30
		SL 48%	1.2	0.60		
	Bolivia	SL 480	1.2	3.00	1	
	Bulgaria	SL 480	1.92		1	
	Chile	SL 400				
	Colombia	SL 480	1.20	0.60	1	

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
	Costa Rica	SL 480	1.20			
		SL 400	0.80			
	Croatia	SL 480	1.92			63
	Ecuador	SL 480	0.96	1.20	1	
		SL 400	1.00	1.25	1-2	60
	Egypt	SL 480	1.68	0.21	1	
	France	SL 480	1.92			
		SL 260	1.04			
		SL 333	0.99			
	Ghana	160	1.28			
	Greece	SL 480	1.20			
		SL 400	1.40			28
	Guatemala	SL 480	2.40			
		SL 400	0.80			
	Indonesia	SL 480	1.92	0.19		9
	Iraq	160	1.28	0.32	1	
	Italy	SL 480	1.92	0.48		60
		SL 400	2.00			60
		6.50%	1.62	0.54		60
		EC 405	2.02			60
	Ivory Coast	EC 160				
	Jamaica	EC 160				
	Japan	GR 11 %	4.40			a
		GR 7 %	2.80		1	a
		5.5 %	2.20			a
		11 %	4.40			
		33 %	1.65			a
	Korean Republic	GR 10 %	3.00			
		WP 40 %	1.20	0.12		
	Macedonia	SL 480	1.92			63
	Malaysia	SL 396	1.58			
	Mozambique	SL 480				
		EC 160				
	Rumania	SL 480	1.92			
		SL 250	0.75			
	Spain	SL 400	2.00			
		SL 480	2.40			
	Taiwan	GR 7 %	2.10		1	a
	Turkey	EC 160	1.60	0.40	1	
	USA	SL 42 %	0.98	0.52	1-2	9

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
		SL 37 %	0.86	0.46	a	9
	Yugoslavia	SL 480	1.92			63
	Zimbabwe	SL 480	2.40			
Rice, Paddy	Taiwan	SL 44.1 %	1.32	0.22	1	a
Rye	Bolivia	SL 480	0.96		1	
	France	SL 333				
	Greece	SL 480	1.20			
	Italy	SL 480	1.92			60
		SL 260	1.04	0.34	1	
		SL 250	1.00	0.33		60
		SL 400	1.60			60
	Netherlands	SL 333	0.75	0.18	1	a
	Spain	SL 480	1.92			
Rye, Summer	France	WP 50%	1.25			
		SL 250	1.00			
Rye, Winter	France	WP 50%	1.25			
		SL 480	1.20			
		SL 480	1.20			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			
Sorghum, Common	Argentina	SL 480	0.96	0.38	1	7
	Bulgaria	SC 200	0.60			
	Chile	SL 480				
	Costa Rica	SL 480	1.20			
	Hungary	SL 480	0.96			
		SC 200	0.80			
	Mozambique	SL 480				
	USA	SL 42%	0.98	0.52	1	b
	Zimbabwe	SL 480	1.44			
Soya bean	Argentina	SL 480	0.96	0.38	1	7
		SL 600	0.6-0.96		1	7
		SL 54%	0.68	0.34	1	7
	Austria	SL 480	1.92	0.64	1	42
	Bolivia	SL 480	0.96		1	
	Bulgaria	SL 480	0.72-1.44		1	
		SL 480	0.72			
		360	0.90			
		SL 320	0.64			
	Canada	SL 480	1.08	0.27	1-2	9

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
	China	SL 480				
		SL 360				
	Colombia	SL 480	1.20	3.00	1	
	Costa Rica	SL 480	0.96			
	Croatia	SL 480	0.96-1.92			63
		SL 600	1.80			63
		SL 360	0.72			
	Czech Republic Slovak Republic	SL 480	1.44			a
		SL 600	1.44			a
	Ecuador	SL 480	0.96	0.48	1	
		SL 26.4%	0.39	0.19	1	90
	Egypt.	SL 480	1.68	0.28	1	
	France	SL 480	1.44			
		SL 360	0.90			
	Greece	SL 480	1.20			
	Hungary	SL 480	1.92	0.77		
		SL 360	0.72	0.36		
	Indonesia	SL 480	1.92			9
	Iran	SL 480	1.44	0.36	1	b
	Iraq	SC 840	2.52	0.63	1	
	Italy	SL 480	1.44	0.48		60
	Macedonia	SL 480	0.96-1.92			63
		SL 600	1.80			63
	Malaysia	SL 396	1.58			
	Mozambique	SL 480				
	Rumania	SL 480	1.68			
		SL 360	0.72			
	Spain	SL 480	1.92			
	Switzerland	SL 480	1.92			
	USA	SL 42%	0.98	0.53	1-2	90
		SL 42%	0.98	0.52	1-2	30
		SL 360	0.84	0.45	1	50
		SL 28.5%	0.51	0.27	1-2	50
	Victoria	SL 480	1.44	0.65	1	56
	Yugoslavia	SL 480	1.92			63
		SL 600	1.80			63
		SL 480	0.96			63
		SL 360	0.72			
	Zimbabwe	SL 480	1.44			

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
Sugar cane	Zimbabwe	SL 480	2.40			
Tropical fruits	Argentina	SL 600				
Turf	Belgium	SL 250	0.62	0.31	1	
	USA	SL 42%	1.96	0.52	1-3	9
Vegetables	Malaysia	SL 396	1.58			
Wheat, Soft	Belgium	SL 333	1.00			a
	Bolivia	SL 480	0.96		1	
	Bulgaria	SL 260	1.04			
	Chile	SL 480	1.20		b	2
	China	SL 480				
	Ecuador	SL 480	1.20	0.40	1	
	France	SL 333				
	Greece	SL 480	1.20			
	Israel	SL 480	0.96	0.48		
	Italy	SL 480	1.92	0.48		60
		SL 260	1.04	0.35	1	
		SL 250	1.00	0.33		60
		SL 400	1.60			60
		SC 12.6%	1.01	0.37	b	
		EC 405	1.62			60
	Japan	SL 40%				a
	Luxembourg	SL 333	0.99	0.50	b	a
	Rumania	SL 480	1.92			
	Spain	SL 333	1.00			15
		SL 480	1.92			
Wheat, Summer	Belgium	SL 333	0.75			a
		SL 250	0.60	0.30	1	a
	France	WP 50%	1.25			
		SL 480	1.20			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			
	Germany	SL 250	0.75		1	b
	Ireland	SL 200	1.30	0.65	1	a
Wheat, Summer Hard	UK	SL 200	1.30	0.65	1	a
	France	WP 50%	1.25			
		SL 480	1.20			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			

Crop	Country	Formulation, g ai/l	Application			PHI, days
			kg ai/ha	kg ai/hl	Number	
Wheat, Winter	Belgium	SL 333	0.75			a
		SL 250	0.68	0.34	1	a
	France	WP 50%	1.25			
		SL 480	1.20			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			
		SC 100	0.70			
	Netherlands	SL 333	0.99	0.25	1	a
Wheat, Winter Hard	France	WP 50%	1.25			
		SL 480	1.20			
		SL 260	1.04			
		SL 333	0.99			
		SL 250	1.00			

<sup>1</sup> Determined by approved use

<sup>2</sup> Not specified by authorities

## RESIDUES RESULTING FROM SUPERVISED TRIALS

Field trials on two varieties of pea were reported from two locations in the USA. Bentazone was applied twice at 1.12 kg ai/ha (double the maximum recommended rate). Samples were taken at intervals of 30 to 40 days after application. The residues in dry peas and hay are shown in Table 2 (Single, 1989).

Winter rye fields were treated at 1.96 kg ai/ha (double the recommended rate) in Germany in 1973. Grain samples contained 0.13 and <0.05 mg/kg bentazone 11 and 21 days after treatment respectively. The metabolites were not determined (Germany, 1994).



Table 2. Residues of bentazone in dry peas and hay resulting from supervised trials at 1.12 kg ai/ha in the USA in 1986.

Location, Variety	PHI, days	Sample	Residues (mg/kg)		
			Bentazone	6-OH-bentazone	8-OH-bentazone
Columbia, Colton	40	dry peas	<0.05	<0.05	<0.05
		hay	<0.05	0.85	<0.05
Columbia, Colton	31	dry peas	<0.05	<0.05	<0.05
		hay	0.66	4.66	0.08
Columbia, Colton	31	dry peas	<0.05	<0.05	<0.05
		hay	1.5	2.6	0.06
Columbia, Moscow, ID	30	dry peas	<0.05	0.18	<0.05
		hay	0.31	1.0	<0.05
Columbia, Moscow, ID	33	dry peas	<0.05	0.06	<0.05
		hay	0.48	0.78	<0.05
Latah, Potlech, ID	34	dry peas	<0.05	0.43	0.31
		hay	2.0	1.4	<0.05

### NATIONAL MAXIMUM RESIDUE LIMITS

In addition to the MRLs reported in the 1991 evaluation, Australia has established an MRL of 0.01 mg/kg for pulses.

### APPRAISAL

Bentazone was first reviewed by the 1991 JMPR. At the 25th (1993) Session of the CCPR (ALINORM 93/24A para 193) it was agreed that there was a need to review the information on GAP as it was inadequately reported in the 1992 Residue Evaluations.

The following additional concerns were expressed.

- (a) France and The Netherlands preferred an MRL of 1 mg/kg for alfalfa forage (green), and suggested that the proposed MRL of 3 mg/kg on maize fodder was not supported by the data in the 1991 residue evaluations.
- (b) Germany indicated that German GAP required a higher MRL for beans (dry), common bean (pods and/or immature seeds), field pea (dry) and garden pea (young pods). Germany was requested to provide written comments.

The USA requested that the proposed MRL on dry peas be increased from 0.05 to 1.0 mg/kg.

- (c) The Netherlands preferred an MRL of 0.05\* mg/kg for potato and, supported by the USA, an MRL of 0.05\* mg/kg for rice.

- (d) Germany queried the fact that the reported limit of determination is lower than the sum of the limits of determination of the three components of the residue.

In order to respond to the questions raised by member countries the Meeting considered the information provided in the 1991 Evaluation as far as the condensed and summarized presentation made it possible.

The residue values reported for dry beans indicate that parent bentazone and its hydroxy metabolites were below the limit of determination in all dry bean samples. In all samples of pods and seeds or succulent seeds, deriving from 74 trials covering the registered application rates, residues were undetectable except in one sample taken 46 days after treatment with bentazone at 1.4 kg ai/ha which contained 0.14 mg/kg bentazone while the 6- and 8-hydroxy metabolites were below the LOD (<0.02 mg/kg).

The Meeting noted the comments of Germany indicating that field beans in trials reported in the 1991 Evaluations were varieties of *Vicia faba* and should be classified as Broad bean (dry) instead of Common bean (Codex Classification of Foods and Animal Feeds).

Since in both dry broad beans and dry common beans the residues were below the limit of determination, the correction of the commodity description does not affect the recommended limits.

The Meeting concluded that the available data do not support an increase of the current recommended limit of 0.2 mg/kg for common bean (pods and/or immature seeds).

New supervised field trials on peas were reported from the USA reflecting the current use pattern. Bentazone was applied twice at a rate of 1.1 kg ai/ha. Samples were taken at intervals of 30 to 40 days after the second treatment. All three of the residue components in three dry pea samples were below the limit of determination (0.05 mg/kg). The fourth sample contained 0.06 mg/kg of 6-hydroxy-bentazone. The remaining two samples had a total residue of 0.28 and 0.79 mg/kg bentazone equivalents allowing 0.05 mg/kg (the LOD) for the undetected parent bentazone. Residues in pea hay ranged from 0.95 mg/kg to 5.4 mg/kg.

The Meeting estimated a maximum residue level of 1 mg/kg for dry peas to replace the previous recommendation (0.05\* mg/kg).

The Meeting concluded that the 0.2 mg/kg limit for immature peas might not reflect uses according to GAP, but there was no information on residues in immature peas resulting from applications according to current US GAP.

Residues in potatoes were below the limit of determination in the majority of samples. However, detectable residues were measured in some samples at 52 and 84 days following treatments with 1.4 kg ai/ha and 1.9 kg ai/ha. (The recommended maximum rate is 1.44 kg ai/ha, and the PHI ranges from 30 to 42 days in several countries.) The results indicate that detectable residues may occur following the use of bentazone according to GAP.

The meeting reaffirmed the previous recommendation of 0.1 mg/kg for bentazone in potatoes.

Residues in barley, oats, rye, sorghum and wheat were below the limit of determination in all samples except one summer wheat sample in which 0.06 mg/kg 6-hydroxy-bentazone was measured. In

this sample bentazone and 8-hydroxy-bentazone were <0.02 mg/kg. The 0.13 mg/kg parent bentazone residue in one rye sample was not considered in estimating the maximum residue level because the sample was taken after a double rate application with a very short (11 days) PHI.

In maize the residues were generally undetectable. In two trials bentazone and 6-hydroxy-bentazone were detected in the ranges of <0.02 to 0.04 mg/kg and 0.02 to 0.11 mg/kg respectively. The higher residues were observed in trials corresponding to GAP.

In rice the residues were below the limit of determination except in one sample in which 0.07 mg/kg parent bentazone was measured. Hydroxy metabolites were undetectable.

The results of trials in cereals indicate that detectable residues in grains may occur when the pesticide is used according to GAP.

The Meeting took into account the likely presence of detectable residues at similar levels in various cereal grains and estimated a new maximum residue level of 0.1 mg/kg for barley, oats, rye, sorghum and wheat and 0.2 mg/kg for maize to replace 0.05\* mg/kg. The meeting reaffirmed the previous recommendation of 0.1 mg/kg for rice.

In maize fodder residues of bentazone ranged from <0.02 to 0.03 mg/kg, 6-hydroxy-bentazone from <0.02 to 0.08 mg/kg, and 8-hydroxy-bentazone from <0.02 to 0.05 mg/kg. The sum of the three residue components never exceeded 0.15 mg/kg.

The Meeting estimated a maximum residue level of 0.2 mg/kg for maize fodder to replace the previous estimate of 3 mg/kg.

The recommendation for alfalfa was based on three sets of results from 4 trials. The total residues ranged from 0.07 to 1.14 mg/kg with some residues below the LOD.

The Meeting reaffirmed the previous recommendation of 2 mg/kg for green alfalfa forage.

The Meeting considered the expression of residues at or about the limit of determination and in the case of cereals recommended replacement of the limits of 0.05\* by 0.1 mg/kg to reflect the fact that detectable residues may occasionally occur in samples following recommended use patterns. In the case of dry beans, however, none of the components of the residue was detectable in any of the samples. Consequently, the 0.05\* mg/kg limit, allowing some latitude for regulatory laboratories, indicates that none of the components of the residues should be present in detectable amounts.

## RECOMMENDATIONS

After reconsideration of the data on residues resulting from supervised trials, the Meeting concluded that the residue levels listed below are suitable for establishing MRLs.

Definition of the residue:

Plant materials: sum of bentazone, 6-hydroxybentazone and 8-hydroxybentazone expressed as bentazone.

Animal materials: sum of bentazone and 2-amino-*N*-isopropylbenzamide, expressed as bentazone.

Commodity		Recommended MRL (mg/kg)		PHI on which based, days
CCN	Name	New	Previous	
GC 0640	Barley	0.1	0.05 /*/	
VD 0561	Field pea /dry/	1	0.05 /*/	
GC 0645	Maize	0.2	0.05 /*/	
AS 0645	Maize fodder	0.2	3	
GC 0647	Oats	0.1	0.05 /*/	
GC 0650	Rye	0.1	0.05 /*/	
GC 0651	Sorghum	0.1	0.05 /*/	
GC 0654	Wheat	0.1	0.05 /*/	

## FURTHER WORK OR INFORMATION

### Desirable

Data on residues in immature peas resulting from current recommended uses.

## REFERENCES

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