UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR - 2 2002

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Memorandum

DATE:

SUBJECT: Review of a Request for Emergency Exemption of Sulfentrazone in North Dakota for Use on Flax to Control Kochia. (02ND0012), DP Barcode (D281479)

FROM: Nicole Mosz, Biologist
Herbicide and Insecticide Branch

Frank Hernandez, Economist
Economic Analysis Branch
Biological and Economic Analysis Division (7503C)

PEER REVIEW PANEL: March 27, 2002

THROUGH: Arnet Jones, Chief
Herbicide and Insecticide Branch

David Widawsky, Chief
Economic Analysis Branch
Biological and Economic Analysis Division (7503C)

TO: Andrew Ertman/Robert Forrest
Minor Use, Inerts and Emergency Response Branch
Registration Division (7505C)

SUMMARY:

The State of North Dakota has requested sulfentrazone for use on flax to control kochia. Kochia (*Kochia scoparia*), especially ALS-resistant kochia, has become an increasing problem in North Dakota. This is the first request for this use. However, sulfentrazone has been granted in North Dakota, South Dakota, Montana, Minnesota, and Kansas for kochia control in various crops. BEAD has reviewed the subject request and has determined that if the weather conditions are favorable, this situation has the potential to be non-routine and urgent, and likely to lead to significant economic loss without the use of this chemical.

(1)

	CONCURRENCES							
SYMBOL	7503C	7503C	7503C	7503C				
SURNAME	MOSZ	Hernandez	Jones	W. Widawsky				
DATE	3/28/02	3/28/02	04/01/02	4/02/02				

OFFICIAL FILE CO

BIOLOGICAL ANALYSIS:

Flax (*Linum usitatissimum*) in North Dakota is grown for seed, which is used in linseed oil. The fiber from the stems is used in fine papers, such as cigarette paper. Flax is often planted in late April to mid-May. Weed control is important in flax production because flax is not very competitive with weeds. Flax was grown on 547,000 acres in 2001. The State expects that up to 250,000 acres will need to be treated for kochia this year (1).

Kochia (*Kochia scoparia*) is an annual broadleaf weed with seed that does not survive long in the soil. This weed thrives under dry conditions with the help of its deep roots, which may reach up to 16 feet under drought conditions. Kochia may grow up to 7 feet tall, but typically grows 3 to 4 feet high with a bushy growth habit. Kochia often emerges around the same time as flax, but may germinate throughout the growing season. ALS-resistant kochia has been documented in the region, leaving growers with fewer options for weed control. Seed dispersal occurs in a tumbleweed manner, which allows kochia to become invasive. Although kochia grows best in dry conditions, kochia has been increasing in severity despite recent wet conditions and growers have been reporting it as an increasing problem. Last year was a dry year, and kochia was a major problem for flax growers (2, 4).

Kochia impacts the crop by reducing yields and interfering with harvest. At harvest, large kochia gets tangled in the combine and may even damage the combine. For this reason, growers may avoid harvesting areas of the field that are heavily infested with kochia. Many letters were submitted with the application describing the difficulty of controlling kochia in flax. One grower wrote that one of his fields, which was the best yielding flax field several years ago, had a problem with kochia and that the yield was about 9 bushel per acre. Another field, without the kochia problem, yielded 17.6 bushels per acre. The State expects yield reductions from 25% to 45% using the best available alternatives for control. BEAD believes this estimate is reasonable under dry conditions. Kochia is a very competitive weed, and is especially difficult in flax, which competes poorly with weeds (2, 3).

Several herbicides are registered for use in flax. However, these herbicides either do not control kochia at all or do not provide residual control of kochia that emerges later in the growing season. Sethoxydim and clethodim are registered for grass weeds. Glyphosate is registered for use under 24 (C) for control of Canada thistle and perennial sowthistle as a pre-harvest treatment. Glyphosate may control kochia that has emerged but will not provide residual control. Clopyralid plus MCPA is available under a Section 18 for control of Canada thistle and perennial sowthistle but will not provide adequate kochia control. Bromoxynil, with or without MCPA, is registered on flax and will control kochia. However, bromoxynil must be applied before the flax exceeds 8 inches in height. Bromoxynil will control small kochia (label recommends application to 2-inch kochia) but has no residual control. Kochia that emerges after bromoxynil has been applied, or is larger at the time of application, will not be controlled. Trifluralin is registered on flax but does not provide consistent control of kochia.

Moldboard plowing before planting in weedy fields is recommended for reducing the level of infestation in kochia, which has short seed survival. Plowing is not feasible in no-till or reduced tillage fields. A large percentage of flax fields in North Dakota are no tillage and moldboard plowing is done very infrequently due to the dry and windy conditions. Growers that do use tillage are likely to use reduced tillage. Plowing is also not likely to be beneficial for more than one season, because kochia seeds would be brought back to the soil surface after subsequent plowing. In flax production, delayed seeding and/or tillage before seeding flax will not provide adequate control because kochia may emerge later in the growing season. Cultivation during the season is also not feasible because flax is often planted in narrow rows (2, 3).

BEAD has determined that this situation has the potential to be urgent and non-routine if weather conditions continue to be favorable to kochia growth.

ECONOMIC ANALYSIS:

Under the requested exemption for 2002, total usage of sulfentrazone on flax is projected to be less than 62,500 lbs. a.i.. Up to 250,000 acres of flax planted in North Dakota are estimated to be treated with the herbicide. The rate of application would be from 0.094 to 0.25 lb. a.i. per treated acre, maximum of 1 application.

With the exemption in place for 2002, the income (yield times price minus cost) of flax growers in North Dakota is projected to remain within its range of fluctuation over the last five years of available data. On the 250,000 acres treated, assuming a yield of 19.5 bushels per acre and a price of $4.82 per bushel, a flax crop valued at about $23.5 million is projected, generating about $3.5 million in income. (See table below.)

In the absence of the requested herbicide to control the kochia, expected yield losses with available alternatives like bromoxynil are likely to be greater than the loss of about 32 percent of the five-year average. The resulting crop value of less than $16.3 million on the 250,000 acres treated would create a significant economic impact for flax growers in North Dakota this year.

Table 1. North Dakota Flax Production Data

Year	Yield (bu/A)	Price ($/bu)	Value ($/A)	Cost ($/A)	Income ($/A)
1996	18.0	6.38	115	74	41
1997	16.5	5.81	96	77	19
1998	21.0	5.05	106	82	24
1999	21.0	3.79	80	81	- 1
2000	21.0	3.31	70	85	- 15
5 Year Average	19.5	4.82	94	80	14
Lowest Yield to Produce Lowest Historical Revenue	13.5	4.82	65	80	- 15

Source: Data submitted by the State of North Dakota.

CONCLUSIONS:

Kochia is an increasing problem in North Dakota, and flax growers have no alternatives that provide residual control of kochia. The expansion in flax acreage in North Dakota over the last few years may have been a factor in the increased kochia pressure on flax, and the loss of efficacy of registered herbicides for kochia control. BEAD has determined that if conditions continue to be favorable to kochia growth, the criteria for an emergency condition will be met this year. The State was unable to provide BEAD with requested data on the impact of kochia in flax production. For future requests, BEAD would like the State to submit data demonstrating the yield impacts of kochia on flax using the best available alternatives, specifically bromoxynil.

REFERENCES:

(1) Berglund, D. R., M. D. Peel, and R. K. Zollinger. Flax Production in North Dakota, NDSU Extension Service, March 1999. Web address: http://www.ext.nodak.edu/extpubs/plantsci/crops/a1038w.htm

(2) Jenks, Brian M. Weed Scientist, North Central Research Extension Center, North Dakota State University. Personal communication with Nicole Mosz on March 18 and 27, 2002.

(3) Zollinger, R. K. 2001 North Dakota Weed Control Guide, NDSU Extension Service, January 2001. Web address: http://www.ext.nodak.edu/extpubs/plantsci/weeds/w253/w253w.htm

(4) Eberlein, C.V. and Z.Q. Fore. Kochia Biology, 11th Annual Manitoba-North Dakota Zero Tillage Farmers Association Workshop. Available at web address: http://www.mandakzerotill.org/book11/kochia.html