

(6-8-99)

JUN - 8 1999

MEMORANDUM

Subject: Review of Request by Montana (99-MT-21) for the use of sulfentrazone (AI: 129081) on Sunflowers to control kochia. [Barcodes: D256253 & D256257]

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We have reviewed the first request by Montana for an emergency exemption to use sulfentrazone (Spartan Herbicide) on 5,000 acres of sunflower to control kochia. Earlier this year, Virginia Dietrich reviewed similar requests from Colorado (99-CO-01), Kansas (99-KS-04), Nebraska (99-NE-04), and Wyoming (99-WY-04). Jim Saulmon also reviewed similar requests for North Dakota (99-ND-17) and Minnesota (99-MN-21).

An excerpt from the Kansas (99-KS-04) review can be applied to this review as follows: The situation as described meets agronomic criteria for an urgent and possibly non-routine condition in no-till and low till sunflowers because an adequate alternative is not available. The situation does not meet the economic criteria for significant economic loss because it appears to be directed toward revenue enhancement and/or expansion of viable sunflower acreage.

Biological Aspects:

This request is based on the following: 1. Sulfentrazone provides excellent control of kochia and other broadleaf weeds, and 2. Sulfentrazone is more effective than pendimethalin (Prowl), the registered alternative, for low-till and no-till sunflowers under low moisture

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conditions.

In regard to weed control in sunflowers, registered herbicides (e.g., ethalfluralin, trifluralin, and pendimethalin) do not provide adequate control of kochia. According to Creger (Personal Communication, 1999), in regards to non-chemical weed control methods, row cultivation and rotary hoe are not used on the sunflower crop. Sunflowers in MT are grown in rows which are 12 inches apart.

Prowl appears to be the only product registered for no-till sunflowers. However, according to Dr. Richard Zollinger, in 1998, research at NDSU indicated that Prowl provided very inconsistent kochia control (43%). Prowl needs rainfall to activate it. The existing ALS resistance of kochia and limited control of kochia by registered products in conservation tillage appear to be a limiting factor in Montana's sunflower production. Also, apparently there have been documented Montana farmer reports that entire sunflower fields have been abandoned because of kochia. It appears that the Montana sunflower growers are in need of a preplant/preemergent herbicide, such as sulfentrazone, that will work under the constraints of conservation tillage.

Leon J. Wrage at SDSU provided eleven pages of copies of data as evidence of ALS resistant kochia biotypes, regarding a related Sect. 18 request (99-SD-04). Included were studies in soybeans and in wheat. The performance of IMI and SU mode herbicides (when used alone) was noted. For example, a 1996 study of ALS Resistant kochia control in soybeans in Marshall County included preplant incorporated Treflan, Sonalan, and Prowl which provided 80%, 75%, and 66% control of ALS resistant kochia, respectively. Thus, there was less than adequate control of kochia.

Economic Aspects

The situation of kochia infested sunflower in Montana does not appear to result in economic loss for a Section 18 exemption. This finding was based on several linked criteria:

1. **The kochia situation in Montana is routine.** Kochia appears to be endemic to sunflower production in all the major sunflower growing states (North Dakota, South Dakota, Minnesota, Kansas, Nebraska, Colorado, Wyoming), all of which have applied for Section 18 exemptions for sulfentrazone in sunflower. Kochia has been a major weed in sunflower since at least the late 1980s. In Montana's case, kochia appears to once again be characteristic of the sunflower production system and not a newly infesting weed. Although the Montana request makes reference to ALS resistant biotypes of kochia, they include no evidence to suggest the proportion or degree of kochia infestation that is made up by herbicide resistant biotype.

Economic losses result when current yields (*without sulfentrazone*) are expected to be less than historic yields (*without sulfentrazone*). The application notes (page 8) that "weed

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competition in sunflower production reduces yield from 30% to 50%." The application claims that yield without sulfentrazone will average 770 pounds/acre. However, lacking sulfentrazone, sunflower producers have realized average yields of 993 pounds/acre over the last four years, with a minimum yield of 850 pounds/acre in 1996, and yields of over 1100 pounds/acre in 1998. The lack of evidence for non-routine crop losses from kochia, separate from endemic losses, suggests the situation must be considered routine with respect to significant economic loss under Section 18.

2. Acreage expansion or change in cropping system do not support economic losses. Economic losses, for Section 18 exemptions, would need to be based on production impacts on current sunflower production acres. Supporting the introduction of a new crop to Montana or conversion to no-till production is not a basis for claiming a Section 18 significant economic loss. Although the application argues convincingly that kochia can substantially reduce sunflower yields, sulfentrazone use in sunflowers appears to be intended (at least partly) to facilitate expansion of sunflower acreage or adoption of no-till production. Sunflower acreage in 1997 was estimated by the Montana Department of Agriculture at 1365 acres, yet the request is for use on up to 5,000 acres, apparently to support expanding acreage. As such, these factors do not qualify as economic losses under routine, albeit yield limiting, conditions. As the application states:

"Sunflower production is new to the State of Montana. Broadleaf weeds are the major weed pest according to discussion with individual producers via phone conversations and grower meetings." [page 7]

"Producers in Montana are new to this crop and are learning that a no-till or minimum till (conservation) system is a requirement for successful sunflower production." [page 8]

"There is substantial *potential for increased sunflower production* which offer [sic] agricultural producers an additional alternative crop to *increase farm income through diversification*. Effective weed control herbicides are important for the economic viability of sunflowers in Montana." [page 9, italics added]

3. Explanation of Economic Loss is Incomplete. The application presents tables estimating the economic loss associated with the emergency condition (page 9). These data are insufficient for determining economic loss, even if it were decided that the situation is urgent and non-routine. As noted above, economic loss is based on the expectation that yields and revenues under the emergency condition will decrease from the average expected yields, revenues, and profits. It is not explained why yields without sulfentrazone should be expected to be lower than typical historical yield, which were also realized without sulfentrazone.

Moreover, the application describes production costs in the aggregate and includes the cost of Spartan as a production cost, which is inconsistent with making the determination

of significant economic loss. Costs need to be disaggregated into specific fixed and variable costs in order to ascertain how costs will change in the emergency condition compared to the usual condition, irrespective of sulfentrazone use. Similarly, yield losses should be disaggregated into those associated with endemic kochia infestations and those associated with an emergency condition.

Conclusion. BEAD recommends that SRRD consider both agronomic and economic aspects in deciding whether to grant Kansas the emergency exemption for the use of sulfentrazone on sunflowers to control kochia in reduced tillage areas.

Appendix 1

Telephone Communication on 6/7/99 with Dr. A. J. Bussan, Extension Weed Specialist, Montana State University, P.O. Box 173120, Bozeman, Montana. Tel: 406-994-7025, Fax: 406-994-3933, e-mail: abussan@mt.edu. James G. Saulmon at USEPA received this information pertaining to Sect_18, 99-MT-21. Questions and responses follow:

1. What is the total sunflower acreage for Montana?

Response: 20,000 acres of sunflowers.

2. What percentage of the 5,000 acres of sunflowers selected for Sect_18 coverage is currently tilled?

Response: 0 % is tilled.

3. What percentage of the 5,000 acres of sunflowers is in no-till or minimum tillage?

Response: 100 % is in no-till or minimum till. The purpose is to conserve both soil and moisture.