

CONTROLLING YELLOW FOXTAIL WITH PRE-EMERGENCE HERBICIDES

Mick Canevari, Farm Advisor
San Joaquin County

Yellow foxtail (*Setaria lutescens*), a summer annual grass, has steadily been on the increase the past ten years. A statewide survey conducted in 1982 by Dr. Floyd Colbert, Lilly Research, and UC Cooperative Extension farm advisors indicated that 25 out of 30 counties surveyed showed yellow foxtail to be a pest in hay fields. Nine counties in the Sacramento and San Joaquin Valleys listed foxtail as the number one weed problem in alfalfa hay production.

Given the opportunity, this grass can infest a hay field in just one season. Yellow foxtail has adapted itself well around the cultural and harvesting practices of alfalfa. It has even persisted against our current chemical control efforts regularly used.

To the producers of alfalfa hay, yellow foxtail has meant

- Lower yielding fields
- Shorter standlife
- Lower TDN and protein hay
- Discounted hay prices
- Less marketable quality hay

To the horse and dairy industry it means:

- Reduced milk production
- Potential mouth ulcerations to animals
- Reduced palatability of hay feed

Reviewing the biology of this weed gives us a better understanding of the strategies required to combat its long season growth.

For many years pre-emergence herbicides have been used in alfalfa hay production, primarily in the dormant period, to control winter weeds and promote weed-free cuttings in the spring of the year. These weed management methods have demonstrated their value and served their purpose well for many years.

We now realize that these currently used herbicides, while providing good winter weed control, fall short in providing effective long season control of summer grass species such as yellow and green foxtail. In fact, test results have revealed that removing winter weed vegetation actually promotes earlier germination of foxtail by allowing sunlight in, and increasing soil surface temperatures which favor earlier foxtail germination.

While the use of currently registered pre-emergence herbicides lacks the season-long effectiveness to prevent foxtail germination, dinitroaniline herbicides applied at the same time of year demonstrated a longer and greater percent of delayed foxtail germination.

This class of DNA herbicides that includes Treflan®, Prowl®, Surflan® and Rydex®, are highly active in controlling many of the grassy weed species. The water solubility of this herbicide group is less than 1 ppm, except in the case of Surflan® that is rated at 85 ppm. Low water solubility relates to a lower leaching fraction from irrigations. Since foxtail seeds germinate at shallow depths and even at the soil surface, it is understandable that the DNA herbicides, which lock into the soil surface and are slow in leaching, give longer control to these shallow germinating grasses.

Tables I, II and III list research trial results in San Joaquin and Madera Counties in 1984 for yellow foxtail control.

Table I
 Yellow Foxtail Control Trial in Alfalfa
 Mick Canevari, Farm Advisor
 San Joaquin County

<u>Early Application</u> Applied 1/12/84		Lbs/A AI	<u>4 Plot Averages</u>			
			Rated 5/21	Rated 6/15	Rated 8/16	Rated 9/13
Treflan	5G	3.0	9.3	9.2	7.7	7.5
Treflan	5G	4.0	9.7	9.6	8.2	7.9
Surflan	4AS	4.0	9.6	9.5	7.9	8.5
Surflan	4AS	5.0	9.9	9.6	8.1	8.3
Prowl	4EC	3.0	9.8	9.7	9.0	9.0
Prowl	4EC	4.0	9.8	9.7	9.0	8.9
Velpar	90%WP	.0	7.6	7.5	4.6	
Karmex	80%WP	.0	7.4	6.3	3.9	
Control			6.	5.5	2.	1.1

Rained: 1/16/84 - .24"

.5 lb paraquat was tank-mixed with herbicides except Treflan Granular which was a separate application.

1 = no weed control
 10 = 100% weed free

Table II
 Yellow Foxtail Control Trial in Alfalfa
 Mick Canevari, Farm Advisor
 San Joaquin County

<u>Late Application</u> Applied 2/22/84		Lbs/A AI	<u>4 Plot Averages</u>			
			Rated 5/21	Rated 6/15	Rated 8/16	Rated 9/13
Treflan	5G	1.0	6.5	6.3	5.7	5.3
Treflan	5G	2.0	8.5	8.2	7.2	8.2
Surflan	4AS	2.0	8.4	8.4	6.8	7.2
Surflan	4AS	3.0	8.4	8.4	7.5	7.6
Prowl	4EC	1.0	8.5	8.5	6.1	5.8
Prowl	4EC	2.0	9.1	8.7	6.9	7.7
Harness	8EC	8.0	8.0	6.8	1.5	1.1
Harness	8EC	10.0	8.5	6.9	1.5	1.0
Control			5.8	5.7	.8	1.0

Rained: 2/24/84 - .01"

Next rains: 3/13 - .52"; 3/14 - .14"; 3/15 - .23"

.5 paraquat was tank-mixed with herbicides except Treflan Granular which was a separate application.

1 = no weed control
 10 = 100% weed free

Table III
Pre-emergence Yellow Foxtail Control
Ron Vargas, Farm Advisor
Madera County

<u>Treatment</u>	<u>Lbs/A</u> <u>AI</u>	<u>Avg</u> <u>Control</u> <u>3/15</u>	<u>Avg</u> <u>Control</u> <u>4/26</u>	<u>Avg</u> <u>Control</u> <u>6/20</u>	<u>Avg</u> <u>Control</u> <u>8/22</u>
Treflan 5G	2.0	9.00	9.12	8.75	8.60
Treflan Pro 5	2.0	8.50	7.60	6.50	2.25
Prowl	2.0	8.75	8.75	7.00	4.25
Surflan	2.0	6.25	6.30	5.25	.75
Furloe	3.0	4.50	3.25	-	-
Kerb	3.0	7.50	4.25	1.00	.25
Rydex	1.0	7.50	8.00	7.50	7.00
Rydex	2.0	7.50	8.00	8.50	8.37
Treflan 5G	3.0	9.00	9.12	9.50	8.75
Prowl	3.0	9.25	9.25	7.75	6.50
Surflan	3.0	7.00	7.00	5.50	2.00
Furloe	2.0	5.50	3.50	.50	.50
Kerb	2.0	6.50	6.50	1.00	1.25
Check	(Velpar .50 (Karmex 2.00 (Paraquat .50	-	-	-	-

Application: 2/2/84

Rainfall within 7 days - .45"

All plots received 2 lbs Karmex, .50 lb Velpar and .50 lb paraquat by grower - 12/83

Treflan Granular

Unlike Treflan 4EC or Pro 5, its physical properties are small, dry granules which will be marketed in the 10 percent active ingredient concentration. This formulation has been registered for use in established alfalfa hay in 1984 at the a.i. rate of 1.0 lb/acre.

This material cannot be tank-mixed with other currently used herbicides since it is applied in a dry form. Because of the granular's physical characteristic, weed vegetation and alfalfa regrowth will not interfere with its ability to reach the soil surface. It must be incorporated by rainfall or sprinkler irrigation.

Prowl

A dinitroaniline herbicide is marketed in the 4EC formulation. Currently it is not registered for use in alfalfa hay, but has been submitted for registration to EPA and CDFA. This herbicide has demonstrated its long-term effectiveness in controlling yellow foxtail when applied at the 2 lbs a.i. rate prior to germination. It, too, must be incorporated by water, either rainfall or sprinklers.

Rydex

A dinitroaniline herbicide manufactured in the 80 percent WP formulation. Currently it is not registered for commercial use in alfalfa hay. This herbicide evaluated in the Madera County 1984 trial (Table III) demonstrated good, long-term foxtail control at the 1.0 lb a.i. rate, and excellent control at the 2 lb a.i. rate. It, too, must be incorporated by water prior to foxtail germination.

Surflan

Also, a dinitroaniline herbicide marketed in the 4AS formulation. It currently is not registered for use on alfalfa hay, and it is not known whether registration will be pursued. It, too, has shown satisfactory results when applied at the 3-4 lb a.i. rate prior to foxtail germination. It must also be water-incorporated for effective results.

Requirement for Application

Two important considerations must be made prior to application:

Herbicide must be applied prior to foxtail germination. In the central valley, including Sacramento and San Joaquin, yellow foxtail germination has been recorded as early as February 22.

2. Herbicide must be incorporated by water, either rainfall or sprinklers. Ideally, rainfall should occur within seven days of application with approximately 1/4" or more. Several research trials conducted in 1984 went without rainfall for 16 days and still produced acceptable results at the higher herbicide rate. Without proper water incorporation, these herbicides will volatilize and greatly reduce their long-term effectiveness.

Summary

This class of dinitroaniline herbicides can give the alfalfa grower commercially acceptable control season long when applied at the proper time and rates. As in the case with all herbicides, good field conditions, uniformity of application, and timely incorporation by rainfall or sprinklers will result in clean, high quality hay cuttings all season long. Even though all the expressed herbicides have been tested with a high degree of crop safety, and commercially available for other crop use in California, Treflan® is the only herbicide registered for use in hay for 1985.

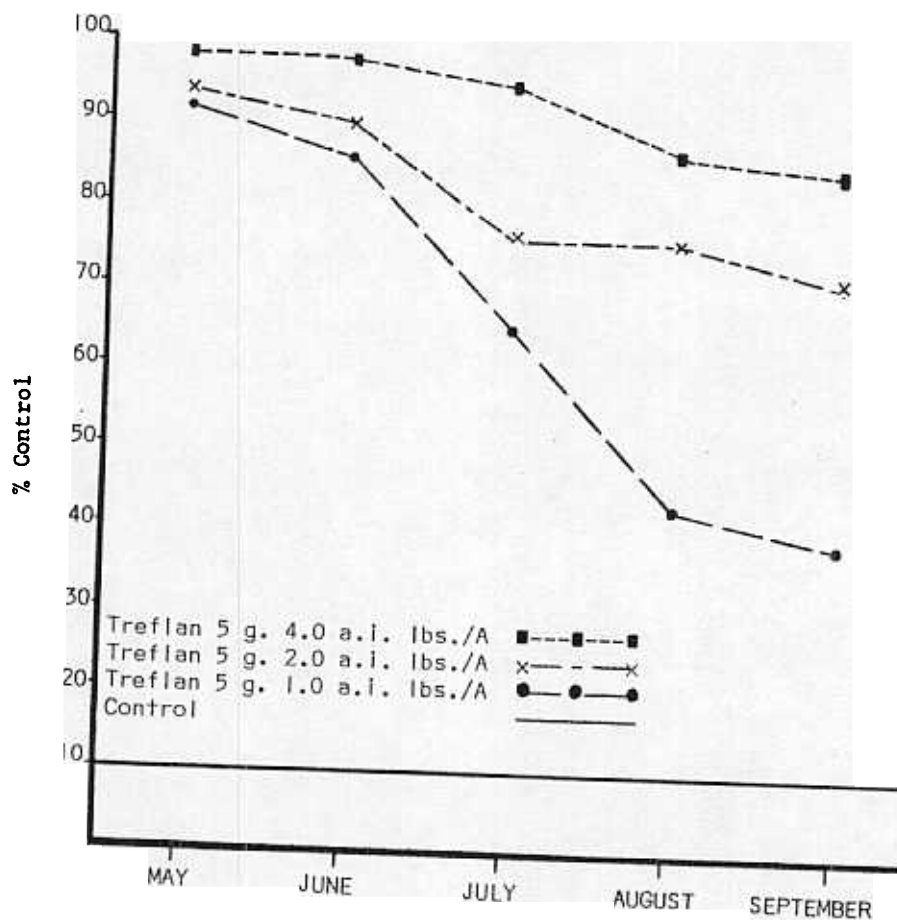


Table IV - Yellow foxtail control as a function of applied rates of Treflan (1983-1984) over time (months). Check plots averaged 25 plants per square foot. M. Canevari.