

# WEED CONTROL IN WESTERN OREGON WHEAT

L.C. Burrill, M.E. Mellbye and B.D. Brewster

Over-reliance on a particular herbicide program will result in weed-shifts to tolerant species. Examples of weed shifts in western Oregon wheat production are infestations of speedwell, brome, and bedstraw, which may be the only species of any significance in fields that have had a long history of diuron and 2,4-D use. These species have always been tolerant of diuron and 2,4-D and the reduction of susceptible weed species has favored their proliferation.

Another serious problem is the development of herbicide resistance in susceptible species. Resistance in weeds has become more common in recent years and is a major problem in crop production. The resistance of ryegrass to diuron and of ryegrass and wild oats to Hoelon has greatly reduced the value of these herbicides in western Oregon wheat production. Continued reliance on Hoelon for grass control in winter wheat without sound crop rotation and herbicide rotation practices is not good management. When possible, all herbicides should be managed to prevent or delay weed shifts and the development of resistance.

The following is provided to encourage and assist the development of effective and sustainable weed management programs in winter wheat in western Oregon. These programs are not as simple as just using Hoelon, but they are effective on the major grass species in the area.

---

L.C. Burrill, Extension Weed Control Specialist, Department of Crop and Soil Science, Oregon State University; M.E. Mellbye, District Agent, Linn County Extension, Albany, OR; B.D. Brewster, Senior Instructor, Crop Science, Department of Crop and Soil Science, Oregon State University, Corvallis, OR.

EXT/CRS 91  
8/92

Key herbicides in the program are FarGo, metribuzin, diuron, Harmony Extra, Finesse, Assert, and Avenge.

## FarGo

FarGo should be an essential component in any program aimed at ryegrass or the bromes, and is the most difficult to get growers to use. The need for FarGo incorporation into the soil seems to discourage some growers, but incorporation is necessary for good performance. Growers may not recognize how much control they receive or how much FarGo helps other herbicides in their program. FarGo should not be used alone. It should be considered essential for the successful use of diuron or metribuzin.

FarGo can be expected to control some but not all of the ryegrass, bromes, and wild oats. Partial control may mean that it controls those that germinate early but not late-emerging plants. It may also mean that grasses are stunted enough to be easily controlled by other herbicides such as diuron and metribuzin.

FarGo must be thoroughly incorporated into the soil. Applications may be made before or after planting, but post-plant applications are safest to wheat. In either case, it is important to keep the wheat seed away from treated soil by either drilling below treated soil or by planting deep enough so that the FarGo can be incorporated above the seed. Incorporation and uniform planting are more difficult when a high amount of straw is on the soil surface, but it can be done. It may be wise to raise the seeding rate by 10 or 20%. In contrast to most herbicides used on wheat, it is not necessary to apply FarGo on damp soil. If thoroughly incorporated, FarGo will not be inactivated in dry soil. In research plots FarGo has increased wheat yield by as much as 31 bushels per acre and provided good control on dry cloddy seedbeds. In general, however, a good seedbed

(relatively free of clods) is important for optimum FarGo performance.

### **FarGo + Diuron**

Diuron applied to moist soil when ryegrass is small or has not yet emerged will sometimes give good control. Diuron-resistant ryegrass exists in some fields with a long history of diuron use. Diuron will not control the bromes or wild oats, but will control annual bluegrass, rattail fescue, and many of our common broadleaf weeds. FarGo applied at planting time will partially control ryegrass and will slow the growth of those that survive. The survivors or newly emerged plants are more susceptible to the diuron because they are weak and small. Also, the use of FarGo allows a delay in the application of diuron which increases the chances of rainfall to make the diuron more effective. The two herbicides may give up to 90% control of ryegrass.

Caution is advised when considering metribuzin following diuron. If the wheat is stressed by the diuron or environmental conditions, the added stress caused by metribuzin could lead to a yield reduction. This reduction in yield may be more than offset by the reduction in weed competition if the weed population is dense. This is particularly true where grasses are the primary weeds.

### **FarGo + metribuzin**

Metribuzin (Sencor/Lexone) when used alone can control a lot of ryegrass and brome, but complete control should not be expected. FarGo at planting followed by metribuzin when the wheat is in the 2-leaf stage should give good control in many cases. A low rate of metribuzin plus a surfactant applied in November to early December seems to be the key to this combination. In some cases, an additional application of metribuzin may be needed. Applications when the grasses have more than two leaves are often ineffective.

The low rate of metribuzin in the fall is usually safer on the wheat and more effective on grass than is diuron. Both diuron and the early application of metribuzin will control small annual bluegrass. Metribuzin will also control speedwell. The addition of Buctril to metribuzin in the fall can improve speedwell and groundsel control. Metribuzin should not be used on Yamhill wheat. Only those wheat cultivars that are known to be tolerant of metribuzin should be treated.

### **FarGo + metribuzin applied late**

A late (Feb.) application of metribuzin usually should be used only if weeds escape a November treatment.

A single application at 0.25 lb ai/A will control speedwell. This treatment should be made after the wheat has secondary roots that are at least 2 inches long according to the Lexone label and after the wheat has five tillers according to the Sencor label. Again, even the high rate of metribuzin may not control grass weeds beyond the two leaf stage.

### **Harmony Extra or Finesse**

The addition of Finesse to metribuzin applied in the fall can improve grass control, and may be warranted when the grass infestation is severe. It should be used only after considering the potential for soil residues that might harm following crops. Harmony Extra has been erratic in improving grass control over that given by the FarGo and diuron or FarGo and metribuzin, but its use will not result in a soil residue problem.

In fields with bedstraw problems, either Harmony Extra or Finesse should be used along with Buctril in the late fall. The choice of Harmony Extra or Finesse will depend on the crop rotation limitations on the Finesse label. It will usually be advisable to use Finesse in the fall because of its longer soil life and better performance on ryegrass and bromes, and use Harmony Extra in the spring if needed. The application of Finesse on wheat with less than three leaves can result in crop stunting if fields are wet. Where weed populations are dense, any adverse effect on the wheat by the Finesse will be overcome by reduction of weed competition.

If Buctril is used in the fall, a mixture of Harmony Extra and Banvel should be planned for early spring when the surviving bedstraw plants are still small. A surfactant usually improves the activity of Finesse and Harmony Extra.

### **Amber**

Amber is similar to Glean and Finesse. It is registered by Ciba Geigy for use in eastern Oregon but not in western Oregon.

### **Assert or Avenge**

Wild oats often will germinate throughout the winter. None of the herbicides mentioned above should be expected to give complete control of wild oats. On fields with a history of wild oats, Assert or Avenge should be used in late winter or early spring. Avenge requires warmer, drier conditions for optimum wild oat control than does Assert.

## Hoelon

On fields with little or no history of use, Hoelon remains an effective and reasonable treatment for ryegrass and wild oats. Hoelon is most effective on the bromes if it is incorporated into the soil or applied preemergence, but only partial control should be expected. Use some of the programs described above on alternate years so that the resistance to Hoelon can be delayed or prevented.

### Good herbicide management

Most herbicides are amazingly reliable under a wide range of conditions. However, careful management of herbicides can make the difference between good and moderate performance. Good management usually means good soil moisture, the correct rate applied when weeds are small, and a uniform application. A smooth, clod-free seedbed is essential because it allows uniform coverage and because it allows more uniform germination and emergence of weeds. Good herbicide management also means rotating herbicides and using cultural practices to prevent weed shifts and resistance.

### Current Research

Data from three trials conducted by the Weed Project in the Department of Crop and Soil Science are summarized in the tables below. These data are intended to give a perspective on what can be expected from various treatments.

Hoelon-resistant Italian ryegrass, ripgut brome, and California brome were seeded in strips across the plots at the Hyslop site (Table 3). Although California brome control was fair with the Hoelon application, the other grasses were controlled poorly. FarGo was equally unimpressive by itself, but did increase wheat yield by 32 bu/A. Treatments that included FarGo and an early application of metribuzin produced the highest grain yields.

Blackgrass and Hoelon-resistant ryegrass at the Rossner site near Bellvue (Table 2) were not controlled well by a repeated metribuzin treatment unless FarGo or Finesse were included. The addition of FarGo increased grain yield by 31 bu/A despite an extremely cloddy seedbed. Harmony Extra did not greatly improve grass control but did help in broadleaf weed control. The best treatment increased yield by 70 bu/A.

Control of Hoelon-resistant wild oats at the Hiebenthal farm (Table 1) was best achieved by applying Assert or by applying Avenge or Assert following FarGo. The use of FarGo with another wild oat herbicide should help delay the development of resistance to these wild oat herbicides.

---

Oregon State University Extension Service offers educational programs, activities, and materials without regard to race, color, national origin, sex, or disability as required by Title VI of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973. Oregon State University is an Equal Opportunity Employer.

---

Table 1. Control of Hoelon-resistant wild oats in winter wheat, Hiebenthal farm, Dallas, Polk County.

Treatment	Rate (lbs a.i./A)	Wild Oat Control (%)
FarGo	1.25	70
FarGo/ Assert	1.25/ 0.47	98
FarGo/ Avenge	1.25/ 1.0	97
Hoelon	1.0	21
Assert	0.47	96
Avenge	1.0	80

  

Herbicide	Date Applied	Wild oat Growth Stage
FarGo	Oct. 25, 1991	pre
Hoelon, Assert	Jan. 7, 1992	2-4 leaf
Avenge	Mar. 3, 1992	3 leaf to 3 tillers

Table 2. Blackgrass and Hoelon-resistant ryegrass control in winter wheat, Bellvue, Yamhill County, 1991-92.

	Rate	Blackgrass	Italian ryegrass	Wheat yield
	(lbs a.i./A)	-----(% control)-----		(Bushels/acre)
FarGo/ metribuzin + Harmony Extra/ metribuzin	1.25/ 0.14 + 0.023/ 0.36	93	89	94
Metribuzin + Harmony Extra + Hoelon	0.14 + 0.023 + 1.0	100	8	32
Metribuzin/ metribuzin	0.14/ 0.36	60	58	49
Metribuzin + Harmony Extra/ metribuzin	0.14 + 0.023/ 0.36	63	58	63
Metribuzin + Finesse/ metribuzin	0.14 + 0.023/ 0.36	100	91	97
check	0	0	0	27

<u>Herbicide</u>	<u>Date Applied</u>	<u>Wheat Stage</u>
FarGo	Oct. 22, 1991	pre
Harmony Extra, Finesse, Hoelon metribuzin @ 0.14 metribuzin 0.36	Nov. 22, 1991 Mar. 3, 1992	2 leaf 2-6 tillers, 0-1 nodes

Table 3. Grass control in winter wheat at the Hyslop Research Farm, 1991-92.

Herbicide	Rate	Resistant ryegrass	Ripgut brome	California brome	Annual bluegrass	Wheat
	(lbs ai/A)	----- (% control)-----				(bushels/acre)
FarGo	1.25	70	23	5	0	99
FarGo/ diuron	1.25/ 1.6	100	38	5	100	100
FarGo/ metribuzin metribuzin	1.25/ 0.14/ 0.36	100	81	20	100	121
FarGo/ metribuzin + Harmony Extra/ metribuzin	1.25/ 0.14+ 0.023/ 0.36	100	79	23	100	124
FarGo/ metribuzin + Finesse/ metribuzin	1.25/ 0.14+ 0.023/ 0.36	100	91	83	100	124
FarGo/ metribuzin	1.25/ 0.38	95	40	13	98	108
Hoelon	1.0	28	13	75	0	82
Metribuzin/ metribuzin	0.14/ 0.36	95	45	30	100	114
check	0	0	0	0	0	67

<u>Herbicide</u>	<u>Date applied</u>	<u>Wheat stage</u>
FarGo	Oct. 15, 1991	pre
Harmony Extra, Finesse, metribuzin @ 0.14, Hoelon diuron	Nov. 21, 1991	2 leaf
metribuzin 0.36, 0.38	Feb. 24, 1992	3-6 tillers, 1 node