CONTROL OF VOLUNTEER PARK KENTUCKY BLUEGRASS IN A NEW PLANTING OF BARON KENTUCKY BLUEGRASS

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Contamination of new varieties of Kentucky bluegrass by seed in the soil continues to be a problem in Central Oregon. This area has been in Kentucky bluegrass production for about 40 years and on some fields, a number of different Kentucky bluegrass varieties has been grown on the same field. Since Kentucky bluegrass seed remains viable in the soil for many years, newly planted varieties can become easily contaminated with volunteer plants from seed in the soil. Also, when fields are taken out of bluegrass seed production and rotated into mint or certain other crops, the old stands are not completely killed and thus, with some fields, remnants of previous stands continue to exist and produce seed, even though alternate crops have been produced. In addition, there is bluegrass growing along irrigation canals, roadsides, fencerows, etc.. This bluegrass produces seed which moves in irrigation water to the fields when alternate crops are grown and thus adds to the problem of volunteer Kentucky bluegrass plants when fields are planted to new varieties.

Over the years, a number of experiments have been conducted in this area to find means of controlling volunteer Kentucky bluegrass in new bluegrass plantings. The charcoal planting method has been quite successful but has not been accepted by the growers in Central Oregon because some of the fields have very light soils and injury has occurred. Also, since there is little use of this method in the area, no one is equipped to make carbon plantings. This experiment was conducted to evaluate other cultural practices that might be used to control volunteer Kentucky bluegrass which would be as effective or more effective than carbon seeding and less expensive, and more acceptable to the growers.

MATERIALS AND METHODS

An experiment was conducted from August, 1980, to June, 1982, at the Central Oregon Experiment Station Madras Research site on a Madras loam soil. Ten treatments as shown in Table 1 were arranged in a randomized complete block design with three replications. Each plot measured 20 feet wide by 45 feet long.

The field on which this experiment was conducted had a barley nursery in the summer of 1980. After harvest the field was burned to remove all straw and subsequently, Park Kentucky bluegrass seed was broadcast at 40 pounds per acre over the entire field. Park is a tall-growing variety that is easily

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Table 1. Control of volunteer Park Kentucky bluegrass in a new planting of Baron Kentucky bluegrass on the Central Oregon Experiment Station Madras Research Site, Madras, Oregon, 1980-82

Cultural and herbicide treatment[a]	Herbicide Rate (lb/A)	No. of Volunteer Plants/m^2[b]	Volunteer Control Score[c]
A. Baron Kentucky bluegrass planted 9-16-80			
1. Field disked, rolled and planted - no herbicide	---	Solid Stand	0
2. Field harrowed, rolled, and planted - no herbicide	---	Solid Stand	0
3. Field harrowed, rolled, carbon-planted, diuron applied	2.5	45	3
4. Field disked, rolled, carbon-planted, diuron applied	2.5	29	7
B. Baron Kentucky bluegrass planted 4-7-81			
5. Field disked, rolled, and planted - no herbicide	---	4	8
6. Propham (11-20-80), glyphosate (3-27-81), undisturbed seedbed, and planted	4.0 +2.0	16	7
7. Propham (11-20-80), glyphosate (3-27-81), rolled and planted	4.0 +2.0	1	10
8. Propham (11-20-80), glyphosate (3-27-81), undisturbed seedbed, carbon-planted, diuron applied	4.0 +2.0 +2.5	5	8
9. Propham (11-20-80), glyphosate (3-27-81), disked, rolled, carbon-planted, diuron applied	4.0 +2.0 +2.5	0	10
10. Field disked, rolled, carbon-planted, diuron applied	2.5	3	9

[a] Herbicides were applied in 40 gal. water/A.

[b] The number of volunteer Park Kentucky bluegrass plants between the seeded rows of Baron Kentucky bluegrass were counted on August 16, 1981.

[c] The volunteer Park Kentucky bluegrass control score: 0 = no control, 10 = 100% control.

recognized when present in lower-growing varieties of bluegrass. After the field was overseeded, it was sprinkle-irrigated with about 2 inches of water during the week of September 8, 1980. On September 16, 1980, several cultural treatments were made and then Baron Kentucky bluegrass was drilled in 12-inch rows without additional treatment or was carbon-planted and treated with diuron at 2.5 lb/A. Baron is a low-growing variety of Kentucky bluegrass and when contaminated by Park Kentucky bluegrass, the Park heads much earlier and is much taller than Baron so that it is easily recognized. After the planting of Treatments 1-4, the field was again irrigated as needed to sprout the seed and to get it established in the fall.

For treatments 5-10, a number of different chemical seedbed and cultural practices were applied during the fall and winter of 1980-81. The remaining bluegrass was planted on April 10, 1981. On those plots that were carbon-seeded on April 10, diuron was applied at 2.5 lb/A immediately after planting. The April 7 seeding was irrigated as required to germinate and establish the bluegrass crop. Likewise, the sprinkle-irrigation was used to move the diuron into the soil and to activate it. The other herbicide treatments depended on natural precipitation. Kentucky bluegrass seed production in the Madras area is entirely dependent on irrigation.

Acceptable Kentucky bluegrass seed production practices for fertilization, rattail fescue and broadleaf weed control, irrigation, and post-harvest residue removal were followed.

Volunteer bluegrass plants between the seeded rows of Baron were counted in a one square meter area for each plot on August 16, 1981. An average number of volunteers for each treatment was calculated from these data.

Control of volunteer bluegrass (Park) was evaluated again on June 4, 1982, by a 0-10 visual scoring system (0 = no control, 10 = 100% control). At this time, Park and Baron had fully expanded panicles and showed a height difference. Plots were not harvested for seed yield because of poor stand for Baron in some plots.

RESULTS AND DISCUSSION

There was a solid stand of Park Kentucky bluegrass on fall planted plots that received tillage alone without herbicide (Table 1). No control of volunteers was achieved. It was impossible to determine the location of the seeded rows. In Treatments 3 and 4, where Baron Kentucky bluegrass was carbon-seeded in the fall and treated with diuron, the rows were distinguishable but there was still a large number of volunteer Park plants between the rows, even though diuron had been applied to control them. When the bluegrass was seeded in the spring, after the various herbicides or cultural practices, there was a marked reduction in the number of volunteer Park plants growing between the rows of Baron Kentucky bluegrass. The volunteer population was eliminated on Treatment 9, where the field was disked, rolled, carbon-planted, and treated with diuron. This was an excellent treatment. A number of other treatments also drastically reduced the volunteer plants between the rows. All of the

spring treatments were much more effective in controlling volunteer Park Kentucky bluegrass than were the fall treatments when evaluated by count of volunteer plants between rows on August 16, 1981.

Further observations on June 4, 1982, when both Park and Baron were fully headed and the Park was 8 to 12 inches taller than the Baron, also, showed that spring plantings have fewer volunteers than did the fall plantings (Table 1). Treatments 7 and 9 gave complete control of volunteer Park Kentucky bluegrass.

These results indicate that much of the problem faced by farmers in Central Oregon is caused by the cultural practice which they follow in growing Kentucky bluegrass. The common practice is to burn grain stubble after harvest in the fall, pre-irrigate, and then plant Kentucky bluegrass as soon as possible. On occasion, they do get some sprout of volunteer grain, etc., which is sprayed with Roundup or paraquat, but because of the need to get the bluegrass planted early so it will produce a seed crop the following summer the grower seldom waits long enough to get the sprout that helps in controlling volunteer Kentucky bluegrass. Thus, as shown in Treatments 1 and 2, when this practice is followed, most of the seed present in the soil survives and germinates along with the crop and contaminates new varieties as they are planted. Carbon planting in the fall reduced the volunteer stand considerably as compared to the common practice but under the conditions in this trial, where the field was overseeded with a heavy rate of Park bluegrass, the treatments were not good enough to overcome the problem. When the seedings were delayed until spring, all of the treatments were much more effective in controlling volunteer Kentucky bluegrass than were treatments planted in the fall, and several of these treatments gave complete, or nearly complete control of the volunteer Kentucky bluegrass. Thus, it would appear that if the problem becomes serious enough so that volunteer Kentucky bluegrass prevents certification of seed fields in Central Oregon, the problem can be overcome by spring planting and coupling this with various herbicide and tillage treatments to control volunteer Kentucky bluegrass that comes from seed in the soil.