

## PERSIAN DARNEL - A NEW WEED PROBLEM

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Persian darnel (*Lolium persicum* Boiss and Hoen.), is not a new weed in western Canada, however it is relatively recent that it began to spread and become a major weed problem. Like most of our weeds, Persian darnel is an introduced species. In North America, Persian darnel was first introduced into North Dakota about 1910, and is reported to have been subsequently introduced into Saskatchewan in 1919 in shipments of durum wheat (4).

Although Persian darnel was reported, in 1925, to be common in wheat fields in the Saskatoon area, in 1950 the area around Scott was the only site where Persian darnel was reported to be "a serious pest" (4). In the 1966 weed survey, Persian darnel was still not considered to be a problem weed (2). However in the early 1970's the spread of Persian darnel was very rapid.

In 1976, Persian darnel ranked 30th on a relative abundance scale (Table 1). By 1979 it had increased to the 15th most common weed in Saskatchewan grain fields, and Persian darnel was reported in 17 of the 41 Agricultural Extension Districts in Saskatchewan (10, 11). Persian darnel had also spread into Alberta where in 1981 it occurred in 14 of 65 Municipalities (1).

Today the spread continues, north and eastward in Saskatchewan, and westward in Alberta. Persian darnel has been introduced into the Peace River district of Alberta, and into the interlake area of Manitoba (Fig. 1). Persian darnel is reported to also be a problem in Montana and North Dakota (8).

The main identifying characteristic of mature Persian darnel plants is that the spikelets are arranged dorsally or edgewise on the rachis, in two rows on opposite sides of the stems, giving the plant the appearance of having been pressed (5).

Persian darnel is an annual grass with narrower leaves and a lighter green colour than wheat or wild oats and it appears to have an oily sheen. Persian darnel is usually shorter than wild oats and seldom exceeds 18 inches in height (7). Persian darnel flourishes in relatively dry areas, establishing dense stands in early spring and, despite its short stature, competes vigorously with most annual crops (Table 2).

The seed of Persian darnel resembles a small wild oat seed. Persian darnel seed is readily spread by moving water, in contaminated seed of forage grasses, or on field equipment, particularly combines. Persian darnel seed germinates in very cool soil in early spring (3).

Cultural control by shallow cultivation and delayed seeding can be reasonably effective. However, as tillage is reduced the weed problem increases. This dependency on tillage for control of Persian darnel is a potential limitation to reduced tillage systems (3,6).

In broad leaved crops such as flax and canola, several herbicides have been registered (9). However, in cereal crops control has been much more limited, and despite the move toward diversification, western Canada is still a wheat monoculture (Table 3).

Research has recently resulted in registration of a new product, tralkoxydim, (Achieve) for selective control of Persian darnel, green foxtail, and wild oats in wheat and barley (Table 4).

This research has effectively removed Persian darnel as a potential limitation to continuous cropping in reduced tillage systems.

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Table 1. Increase in relative abundance of Persian dandelion in Saskatchewan surveys, 1976 to 1979.

| Year | Ranking <sup>1</sup> |
|------|----------------------|
| 1976 | 30                   |
| 1977 | 27                   |
| 1978 | 23                   |
| 1979 | 15                   |

<sup>1</sup> Ranking of most frequently occurring weeds

Table 2. Effect of Persian dandelion on wheat yield

| Persian dandelion   | Reduction in wheat main yield |                   |
|---------------------|-------------------------------|-------------------|
| Density             | Wild oats                     | Persian dandelion |
| (#/M <sup>2</sup> ) | (%)                           | (%)               |
| 10                  | 10                            | 11                |
| 30                  | 12                            | 15                |
| 100                 | 29                            | 19                |
| 300                 | --                            | 28                |

<sup>1</sup> Average of five years data.

Table 3. Crops in Western Canada, 1991 (%)

| Crop   | Manitoba | Saskatchewan | Alberta | Total |
|--------|----------|--------------|---------|-------|
| Wheat  | 57.1     | 49.5         | 37.3    | 47.0  |
| Barley | 14.3     | 7.7          | 26.1    | 13.8  |
| Canola | 13.3     | 7.8          | 14.4    | 10.4  |
| Flax   | 6.6      | 1.3          | 0.3     | 1.7   |
| Rye    | 0.9      | 0.7          | 0.8     | 0.    |
| Fallow | 7.8      | 32.9         | 21.1    | 26.3  |

Table 4. Effect of stage of application on control of Persian dandelion in wheat with Achieve DG.

| Achieve DG          | Leaf  | Dry weight          | Control |
|---------------------|-------|---------------------|---------|
| (g/ha) <sup>1</sup> | Stage | (g/m <sup>2</sup> ) | (%)     |
| 0                   |       | 449                 | 0       |
| 250                 | 3     | 9                   | 98      |
| 250                 | 5     | 131                 | 71      |

<sup>1</sup> 250 g/ha active/ha = 0.4 kg product/acre

Fig. 1

