

SURVEY OF WEED SEED CONTAMINANTS IN WESTERN OREGON CLOVER PRODUCTION

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Introduction

It is estimated that over 85% of clover seed produced in the United States is grown in Oregon, primarily in the Willamette Valley. Current commodity data indicates that 11,340 acres of crimson clover, 14,180 acres of red clover, and 10,150 acres of white clover were harvested for seed in Oregon in 2013 (OAIN, 2014). The remaining U.S. acreage is primarily located in other northern regions of Oregon, Washington, and Idaho.

Effective weed management in seed production fields is important for maximizing seed yield potential and quality. Seed yield losses occur from either direct weed competition in the field and/or during seed cleaning. As new weed management strategies are developed for clover seed production in Oregon, it is important to understand which weed species cause the most clean seed loss—and subsequent economic loss—during the seed conditioning process.

The objective of this survey project was to develop a practical summary of weed seed occurrence in Oregon clover seed lots, based on interviews conducted with personnel at clover seed cleaning facilities in western Oregon. This information will be useful to both field consultants and growers who make field management decisions and to Extension and other research scientists who conduct weed management research in clover seed crops.

Materials and Methods

In the winter of 2013–2014, surveys were conducted at 12 clover seed conditioning facilities in western Oregon. Of these facilities, five handle crimson clover, six handle red clover, and five handle white clover. The personnel at the facilities were asked to list specific weed species that are commonly found in harvested seed lots. They were then asked to indicate which of these species are relatively easy to clean out, generally difficult to clean out, or sometimes cannot be completely cleaned out.

Results and Discussion

Results from this study (Table 1) indicate that a diverse range of weed seed contaminants can occur in harvested seed lots. The most common weed seed contaminants across all clover species were broadleaf species, including dock species, Brassica species, and small-

seeded vetches. In addition, annual grass weed seed contaminants, in particular *L. multiflorum* and *P. annua*, were reported to be an increasing problem in all clover species.

Small-seeded vetches (e.g., *V. hirsute*, *V. tetrasperma*) were consistently noted as the primary contaminant in crimson clover seed lots. Buckhorn plantain (*P. lanceolata*) was reported to be one of the most common “difficult”-to-clean weed species in red clover seed lots, while curly dock (*R. crispus*) was reported to be very problematic in both red and white clover seed lots.

Maturity of the weed seed was reported to be an important factor in the ability to separate out seeds during cleaning. Depending on the clover species, smaller immature weed seeds or larger mature weed seeds may or may not be easy to clean out with standard equipment. For example, it was reported that mature catchweed bedstraw (*G. aparine*) is easier to clean out of a red clover seed lot than an immature seed of the same species, which can be very difficult to clean out. Additional information gleaned by the survey indicates the importance of utilizing various types of seed cleaning equipment in order to effectively separate specific weed species that tend to be problematic in clover seed lots. It was noted that clover seed is generally much more difficult to clean than grass seed. Various pieces of specialized equipment, including air screen cleaners, indent separators, gravity decks, and velvet rollers, must be utilized to adequately clean clover seed lots. Each cleaning facility may contain different types of cleaning equipment, and this will affect its ability or ease in cleaning certain species.

Acknowledgments

Appreciation is extended to Berger Seed Company, Behrman Farms, Cala Farms, Carlton Seed Company, Jewett Cameroon Seed Company, K & K Farms, L3 Farms, Marion Ag Service, Mid-Valley Farms, Scharf Farms, and Vandyke Seed Company for their participation in this survey project.

References

Oregon State University. 2014. Oregon agricultural information network. Oregon State University. <http://oain.oregonstate.edu/>

Table 1. A summary of weed species reported in harvested clover seed lots by seed conditioning facilities in western Oregon.

	Commonly found in harvested seed lots	Most difficult to clean	Sometimes cannot be cleaned	Easier to clean
Crimson	Small vetches (tiny, narrowleaf, sparrow, four seed), cutleaf geranium, catchweed bedstraw, wild Brassicas (radish, mustard), poison hemlock, toadflax, dogfennel, wild carrot, annual ryegrass	Small vetches Catchweed bedstraw Wild Brassicas Cutleaf geranium	Small vetches Cutleaf geranium	Dogfennel Nipplewort Wild carrot Annual ryegrass
Red	Curly dock, buckhorn plantain, wild Brassicas (radish, mustard), dodder, Canada thistle, dogfennel, mallow, wild carrot, catchweed bedstraw, sharppoint fluelin, annual ryegrass	Buckhorn plantain Curly dock Wild Brassicas Dodder	Buckhorn plantain Catchweed bedstraw (immature) Dodder	Wild carrot Dogfennel Prickly lettuce Nipplewort Canada thistle Catchweed bedstraw (mature) Sharppoint fluelin Annual ryegrass
White	Mayweed chamomile, curly dock, pigweed, knotweed, lambsquarter, sowthistle, Canada thistle, witchgrass, chickweed, hop clover, prickly lettuce, catchweed bedstraw, annual bluegrass	Curly dock Lambsquarter Pigweed Dogfennel Thistles	Curly dock	Prickly lettuce Nipplewort Some thistles Hop clover Annual bluegrass