



## Turf Contaminants

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Seed Technology

As a commercial seed testing laboratory, Seed Technology has been intimately involved in lawnseed testing, its specialty, for over two decades. We have accumulated records until they "run out of our ears" on what foreign seeds are contained in the bluegrasses, fine fescues, bentgrasses, and turf-type perennial ryegrasses. These seeds end up in a sod field, on golf courses, and in homeowner front yards wherever cool season grasses are planted in North America.

Some species are serious lawn pests, — but they may or may not be "weeds" by legal definition (oftentimes "crop" is far more "weedy" than are weeds). Others are of little consequence, because they are squeezed out of a turf by any well-adapted turfgrass. Still others make themselves quite a nuisance, but can be controlled inexpensively, and with rather little effort.

We don't hold things like dande-

lion and plantain to be too serious, even if they are among the most ubiquitous lawn weeds, because they are so easily eliminated selectively with inexpensive herbicides such as Trimec. A few are almost never carried in lawnseed (at least in the seed which is produced domestically), — rough bluegrass, *Poa trivialis*, for example. *Poa trivialis* can be a real hazard in a rainy year if it ever gets started in the sod (as Dr. Bob Newman reports for Wisconsin in 1973).

We are almost drowning in a sea of data (records accumulated from thousands upon thousands of official tests), but a logical way of pulling something together for the benefit of the sod grower, golf course superintendent, and the homeowner is not easy.

The first thing we must attempt is a rough assemblage of those species which are: A. Not too much of a problem, because they are control-

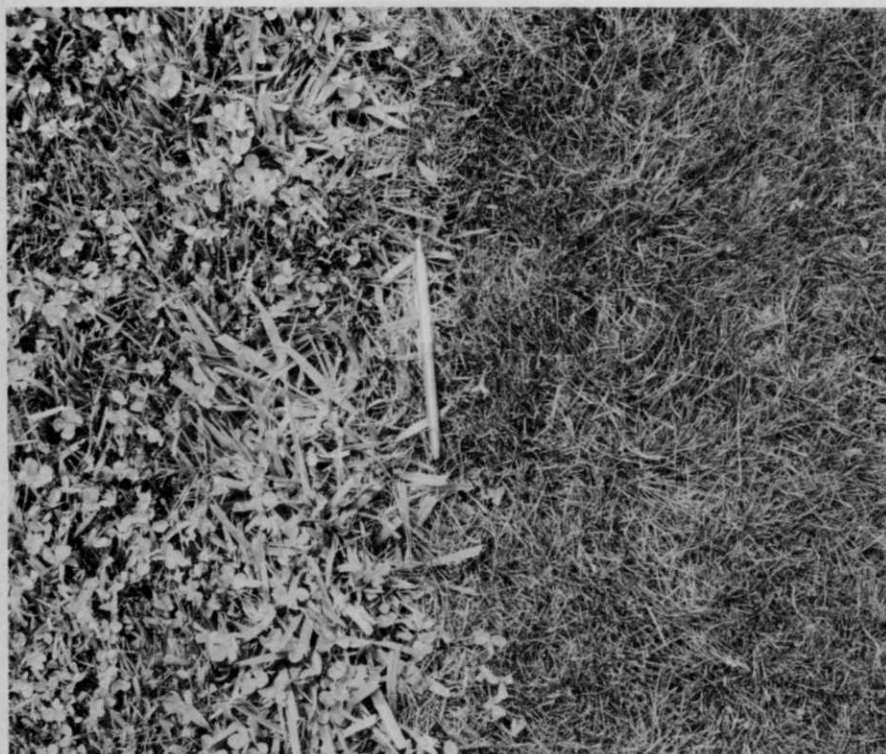
lable; B. More Undersirable, because they are difficult to control; and C. Very Undesirable, because they are either extremely difficult or impossible to eradicate. University weed specialists agree fairly well on what species fit these particular categories, although opinion varies according to climate and region.

Because some of the off-types seeds are found in a large percentage of the seed lots entering commerce, perhaps they should be considered more serious than others which show up only occasionally, and are represented by only a few seeds when they do occur. This is a rather unpleasant complication, for which we have no ready solution (say some mathematical formula for "seriousness," which might weigh both frequency of occurrence and abundance when found.).

Yet, one could equally well argue that even one seed of a Class C species is too much, even though seed lots containing it show up only rarely. There is really no alternative for a professional turf grower but to have each lot of seed that he is planting given a complete analysis for all contaminants. This service is, of course, the function of Seed Technology, and our commercial *raison detre*.

We maintain lists of contaminants likely to occur in various kinds of seeds produced in various regions. And we know the regions where the seed is offered and just which seeds are the cause for greatest concern. In a general way lets take a look at how the situation shapes up regionally, drawing upon the expertise of

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Look at the difference choice of seed can make. At above right, top quality seed free of undesirable inclusions has been sown. At left, a variety of troublesome weeds have appeared.

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weed specialists at leading universities. (See Box)

### CLASS A SPECIES — CONTROLLABLE

About thirty-five species seemed worthy of listing in this category, as being common or fairly common in commercial turf seed. We realize that a goodly number occur infrequently in certain kinds of seed, and may not even be a problem in some areas. Typical of this group of contaminants which compete poorly with turfgrass, or which are easily controlled with readily available herbicides are: Carpetweed *Mollugo*

*verticillata*, chickweed *Stellaria media*, dandelion *Taraxacum officinale*, knotweed *Polygonum aviculare*, plantain *Plantago spp.*, purslane *Portulaca spp.*, Shepherd's purse *Capsella bursa-pastoris*, and several annual grasses.

### CLASS B SPECIES — MORE UNDESIRABLE

Here are some of the weeds which are more persistent or have other objectionable features. Obviously there is no hard-and-fast separation from Class A species, and what may be a problem in one region may be a nuisance at most in another. Tenacious species such as white clover *Trifolium repens*, goosegrass *Eleu-*

*sine indica*, puncturevine *Tribulus terrestris*, sandbur *Cenchrus spp.*, Canada thistle *Cirsium arvense*, and wild onions *Allium spp.*, are typical problem pests that are sometimes spread through lawnseed.

### CLASS C SPECIES — VERY UNDESIRABLE

This group includes many of the perennial haygrass "crop" plants, and a few of the respected lawngrass species (such as volunteer *Agrostis spp.* if introduced where unwanted). Some, such as bermudagrass, may be serious in the border states, but not in more northerly states where it will winterkill. Most are Monocots not susceptible to selective elimination with familiar phenoxy formulations. Several are widely recognized agricultural weeds including nut-sedge *Cyperus spp.*, quackgrass *Agropyron repens*, and familiar pasture perennials such as bromegrass, tall fescue, orchardgrass, redtop, and timothy. Perhaps a few dicots, such as speedwell *Veronica spp.*, should be included here rather than in Class B.

Here, in very brief review then, are what the pros tell us are the major lawn weeds and problems for their regions:

**Northeast:** In New Jersey, Dr. Engle observed that many familiar lawn weeds are a "problem," even though controllable, commonly from residual seed in the soil. Chickweed, cinquefoil, clover, crabgrass, dandelion, dock, goosegrass, ground ivy, heal all, horsenettle, knotweed, black medic, wild onion, oxalis, plantain, sheep's sorrel, sowthistle, spurge, violet, and yarrow are such nuisances, even if only Class A or B.

Bermudagrass can be a serious problem in middle Atlantic latitudes. So are cool season grasses such as annual bluegrass, bentgrass, tall fescue, nimblewill, orchardgrass, quackgrass, and velvetgrass. The sedges and speedwell might merit a Class C rating.

Dr. Skogley, in Rhode Island, feels there has been over-reaction about annual bluegrass and Canada bluegrass, which he considers infrequently serious in lawnseed. Dr. Jagschitz concurs that goosegrass is quite a problem, very difficult to control (particularly in "sensitive" turf such as bentgrass). But he has faith in modern measures for handling most of the above-cited weeds.

Dr. Troll, for Massachusetts, would add crabgrass, ground ivy, and oxalis to goosegrass, as the most serious lawn pests, — all typically adventive in the soil. He agrees that the coarse perennial grasses, as well as sedges

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### Everyone In The Act . . . .

The Lawn Institute suggested sending our rough lists of contaminants to the University of Massachusetts, University of Massachusetts, University of Rhode Island, Cornell University, Pennsylvania State University, and Rutgers University for the Northeast; Ohio State University, Michigan State University, University of Wisconsin, University of Minnesota and Iowa State University for the upper Midwest; Purdue University, and University of Illinois for the lower Midwest; Vir-

ginia Polytechnic Institute and the University of Missouri for the border states; Kansas State University, Oklahoma State University of Colorado for the Plains environment; and the University of California for the Far West. Bingham, Daniel, Engle, Fults, Hodges, Jagschitz, Keen, Martin, Newman, Payne, Troll and Youngner, many of whom have consulted with other colleagues. We are especially grateful for their helpful comments, some of which are referred to in this review.



When sowing a lawn, weeds like these (above) are certainly non-grata. Many come from residual seed in the soil. They can be pruned when good, weed free seed of modern cultivators is planted.

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and speedwell, are especially injurious in the lawn and worthy of a C rating. Troll marks 26 of the controllable weeds (Classes A and B) of our talley as being introduced through lawnseed, at least occasionally.

**Midwest and Border States:** The situation in the upper midwest is not greatly different than in the northeast. Dr. Newman, Wisconsin, says that, unexpectedly, *Alopecurus aequalis* (a foxtail), a water-loving species, was quite a problem during 1973. *Poa trivialis*, also thriving on moisture, has been an even worse pest in sod. In Wisconsin most sod is grown on muck soil, where pre-emergence preventers don't work well.

Dr. Daniel, Indiana, lists the same coarse grasses and sedges as occur in the Northeast as being among the most pernicious, certainly Class C candidates. In the southern Midwest bermudagrass and even dallisgrass join the group (though neither survives in the northern Midwest). Nor does Daniel think kindly about *Poa annua*. Barnyardgrass, crabgrass, goosegrass, and *Setaria* foxtail are universal pests, controllable but troublesome.

In the border states lawn weeds become more diverse, and often harder to control (crabgrass, for example). Dr. Bingham says that in Virginia goosegrass, ground ivy and sandbur *Cenchrus* can be controlled, but not easily. He'd go along with

Class C weeds troublesome farther north.

**Plains States:** In the prairie environment the weed cast changes, though irrigation brings in weeds typical of more humid climates. Dr. Keen, Kansas, finds clover, henbit, knotweed, and violet fairly troublesome, wild onion, very bothersome. On the other hand, bentgrasses are not much of a problem, nor most of the coarse perennial pasture grasses. It seems to add up to fewer Class C problems in Kansas.

In Colorado, Dr. Fults finds bentgrass, dandelion, tall fescue, orchardgrass, quickgrass, and spurge to be weeds of major importance. Though persistent, some of them are, of course, controllable, and then Class B rather than C. Some weeds causing difficulty in the east are of little or no importance, — dallisgrass, oxalis, wild onion, violet, even sedges and *Panicum* witchgrass. He notes that a lot of grama *Bouteloua* crops up in lawns in southern Colorado, a prairie species seldom encountered in the east. Surprisingly, puncturevine *Tribulus* is only slightly important, are as nimblewill and bermudagrass. Bromes, chickweed, clover, crabgrass, ryegrass, sandbur, yarrow and some of the other weeds rating Class C farther east are only "moderately important."

**Far West:** Dr. Youngner, California, seconds the nomination of difficult eastern pests (goosegrass and dallisgrass, for example), and adds a few notorious local examples as well: dichondra and pennywort *Hydrocotyle*.

Of course in California some of the "weed" grasses are also used as lawngrasses, — common bermuda and tall fescue. The eastern haygrass species such as orchardgrass and brome grass are not serious in lawns in California. Velvetgrass is quite difficult, but not too commonly met with.

Prostrate spurge is vicious, as may be bur clover *Medicago hispida*. Occasionally *Poa trivialis* is noted as a contaminant in some seed lots. Fortunately, nimblewill is seldom met with. Kikuyugrass *Pennisetum clandestinum*, a tropical introduction, is nearly uncontrollable where it gets started, though hardly a lawnseed problem. □

## European Eupip. Dealers See Mfg. Plant, Sod, Turf

Fifty-two European turf maintenance equipment dealers toured a sod farm, two high school athletic fields and the Ryan Equipment Company manufacturing plant in St. Paul, Minn.

The two-day field trip was hosted by Ryan officials in cooperation with Orag Inter Ltd. of Baden, Switzerland. Orag Inter Ltd., one of 19 Ryan distributors operating in Europe, arranges similar tours to the United States every two years for its dealers and their wives.

The visitors from France and Switzerland represented turf maintenance markets including landscaping, retail sales and golf course maintenance. The dealers were in greater St. Paul in mid-October. They were accompanied by James B. Briggs, group vice-president of non-marine products with Outboard Marine Corporation; Vaughn E. Border, director of marketing with OMC-Lincoln; Vern Worrel, general manager of Cushman and Ryan turf maintenance equipment; and Russell Rose, a district sales manager.

On the first day, dealers toured the Label Lawn sod farm in nearby Lake Elmo, Minn. Label Lawn covers more than 600 acres and is one of the largest sod farms in Minnesota. The dealers also visited athletic fields in neighboring White Bear Lake and Anoka, Minn. Both fields are undergoing a five-year experimental turf maintenance program co-sponsored by Ryan.

The educational trip ended with a visit to the Ryan manufacturing facility. The plant manufactures turf maintenance equipment and employs more than 100 persons.