

# THE CURIOUS CASE OF HIGHLAND BENTGRASS

By Robert W. Schery

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The title may sound like Sherlock Holmes or Perry Mason, but the inspiration came from *The Garden Journal* itself. In reading Dennison Morey's interesting evaluation of the relative superficiality of rose breeding (Vol. 13, No. 3, May-June, 1963), a comparison with quality lawn grasses was inevitable.

The best lawn grasses from seed are the well-known Kentucky bluegrasses (*Poa pratensis*), the fine or red fescues (*Festuca rubra*), improved cultivars of which are grown in Oregon, and the bentgrasses (*Agrostis*, in various species). Kentucky bluegrass and fine fescues are the main ingredients of quality lawn seed mixtures for the northern two-thirds of the nation, while the bentgrasses are mostly used alone for speciality turfs which can receive the sort of care that bentgrass merits.

The genetic situation is peculiar to each species, and not a little confusing. Kentucky bluegrass, almost surely an adventive from Europe, seems a thoroughly mixed-up polyploid which has for the most part adopted apomictic (non-sexual) reproduction by seed. Nature has so stirred bluegrass heredity that man can scarcely improve upon the brew, even were he inclined to take the trouble to meddle with crossing a predominately apomictic species. A plethora of Kentucky bluegrass cultivars are on the scene, simply selected out of wild or natural Kentucky bluegrass populations and perpetuated by rouging a largely true-breeding (because of apomixis) population. Outstanding cultivars can be found, for a particular trait, an especial climate, and so forth, but few selections match the versatility and wide adaptability of the parent natural Kentucky bluegrass, a hereditary mélange with all the flexibility that this implies.

Fescues are not so obligingly apomictic, but here, too, selection and isolation have been the chief techniques for uncovering new cultivars. On occasion "inbreds" are combined in the planting field, both with fescue and with certain bentgrasses, to yield "polycross" seed. To the best of my knowledge, controlled sexual crossing has not wielded any very unusual or useful cultivars, although it is something of a triumph that Dr. Buckner, at the University of Kentucky, was able to achieve a cross so wide as between ryegrass (*Lolium*) and tall fescue (*Festuca arundinacea*). All in all, it seems as though with the better turf grasses, unlike with roses, there have been no outstanding results from formal breeding programs which demand the crossing of different botanical, or even horticultural, varieties. Selection from what nature has supplied does just about as well (there is plenty of ploidy and genetic intermixture already). Moreover, the economic use of a good turf grass demands not a distinctive shape or shade of flower, but only a persistent groundcover of green, albeit of attractive, fine texture. Subtleties are thus not so important in a turf grass cultivar as in a rose or other ornamental. Just so the basic essentials of persistence, adaptiveness to mowing, and low-spreading growth exist, how the lawn grass is treated (fertilized, mowed, weeded, watered) makes more difference than hereditary subtleties. For such fundamental desiderata, natural selection seems already to have accomplished more than planned breeding. The few broadly based attempts at sexual

crossing, such as the extensive series of matings between bluegrass species and ecotypes with Jens Clausen's Carnegie Hybrids, have almost invariably yielded inferior rather than superior variants for clothing suburbia's luxurious swards.

As an example of this state of affairs in the realm of quality turf grasses, let's take a look at the "curious case of Highland bentgrass," about which we can speculate a bit more readily because of the geographical confinement of the modern product and its production. The diverse terrain of western Oregon, where bentgrasses are so much at home, supplies many ecological niches within a relatively small geographical area, too.

## Highland History

Harry A. Schoth at Oregon State University has checked up on the early history of bentgrasses in Oregon, to the extent that the imperfect and fragmentary evidence allows. It is Schoth's belief that the many cultivars (or even entities regarded as botanical species) probably originated from introduction of unselected European lots of "mixed German bent." As this polygot bent was spread widely on the west slope of the Cascades, there was apparently natural selection of variants for differing habitats.

Today, there are several recognized species or cultivars, corresponding roughly to different climate and locale. The taxonomy of the bentgrasses is very confused. Most agriculturists follow Peck's treatment for Oregon and Hitchcock's (Hase) (*A Manual of The Grasses of The United States*, in which creeping bentgrasses are given specific status as *Agrostis palustris*, colonial forms (including Highland and Astoria) specific status at *A. tenuis*. In addition, a coarser haygrass species, generally termed redtop, is considered *A. alba* in Hitchcock's manual. Not all authors recognize these delimitations nor necessarily these specific names (viz. Abrams' *Illustrated Flora of The Pacific States*).

The situation is further complicated by many recent introductions from the far corners of the world, and by a wide number of non-commercial specific entities which most authors treat as endemic. The Taxonomic relationships are confused not only in the United States, but in Europe and elsewhere. At present Chris Eisele of Darmstadt, Germany, is inquiring of informed persons throughout the world in an effort to make some sense out of bentgrass classification in Europe. There is real incentive for this in Germany, because taxation on the sale of seeds differs significantly whether the grass be classified as an agricultural species (as redtop would probably be in this country) or as an ornamental species (as most creeping bents, and velvet bent, *A. canina*, would be). *A. tenuis*, as presently understood, could justifiably be considered either, depending upon choice of example.

(Continued on next page)

THE CONSTANT DROP OF WATER WEARS AWAY  
THE HARDEST STONE,

THE CONSTANT GNAW OF TOWSER MASTICATES  
THE TOUGHEST BONE,

THE CONSTANT WOOING LOVER CARRIES OFF  
THE BLUSHING MAID,

AND THE CONSTANT ADVERTISER IS THE ONE  
WHO GETS THE TRADE.



## Highland's Hills

A segregate from the bentgrass complex in Oregon found certain cleared hills in the foothills of the Cascade Range just southeast of Salem, Oregon (Willamette Valley), very much to its liking. Indeed, in this relatively restricted area, Highland bentgrass, as it became named,<sup>1</sup> has proved irrepressible. Here old fields turn to Highland bent, just as cultivated soils in the upper Midwest turn to Kentucky bluegrass. The grass seems ideally adapted to make a fine protective cover on land generally too sloping for cultivated crops, and has extended its domain appreciably in the last three decades.

Although differences are not invariable and perfect, the cultivar now recognized as Highland bentgrass seems distinguishable from the creeping bentgrasses in seed, panicle, and ligule characteristics, and in general mass appearance in the field. Distinction between Highland and Astoria, both of them *A. tenuis*, is not so easily recognized, and scarcely possible on the basis of voucher specimens alone. But agronomists who are familiar with the growing characteristics feel that recognition is possible, at least during certain stages. It stands to reason that there is some segregation of genes to conform with habitat, for Astoria bentgrass is grown on low-lying soils, generally high in peat and "swampy" until drained, in the more coastal areas where rainfall is exceptionally heavy (up to ninety inches per year).

By contrast, Highland bentgrass flourishes in the hilly region where soils are heavier and better drained, where summers are hot and bright, and where rainfall is more limited (in the neighborhood of forty inches, mostly during winter). The Highland cultivar is almost indistinguishable from what is marketed as "Colonial" bentgrass, the latter having become the approved common name for all *A. tenuis*. Seed from the circumspect Highland area is termed "Highland Colonial," while that from other sections simply "Colonial."

### Highland Versatility

The parallel between Highland bentgrass and Kentucky bluegrass is interesting. Natural Kentucky bluegrass, with a complex and extensive gene assortment, has supplied candidate grasses which have made first-rate ecotype cover in many differing habitats thousands of miles apart in this country. Evidently Highland is a segregate out of a similar broad complex of bentgrasses, made by nature but recognized and perpetuated by man. Highland is thus bequeathed a fine measure of identicalness nicely blended with a generous measure of subtle genetic variability which should stand it in good stead as a lawn grass. This chance alliance of adapted segregate with unusual foster habitat satisfied an ecological situation somewhat peculiar for bentgrass. One would not expect a bentgrass to do so well as does Highland on unirrigated hills where summers turn hot and dry—such as are summer conditions in the hot midwestern United States, which is generally considered poor habitat for bentgrasses.

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The question is inescapable: if a bentgrass segregate has become adapted to such an ecological situation in Oregon, why would it not fit similar climates in the East? Certainly it seems as though it should<sup>2</sup>. But it is questionable whether the pure Highland cultivar has been thoroughly enough and widely enough tested through the eastern United States to know. In good "bentgrass country" of the eastern United States, such as near the Great Lakes and in New England, much volunteer bentgrass is already growing, possibly some native, but more likely escapes from seed mixtures sown in the area through the decades. Included are many variants which form dense colonies or "mats," which are both distracting and difficult to care for when they invade lawns planted to other grasses. For this reason, the name "bentgrass" has not been looked upon favorably everywhere.

Experience with Highland bentgrass on the grounds of The Lawn Institute, however, indicates that it is not an aggressive invader of bluegrass—indeed the reverse seems to be true. We are intrigued by the possibility that this may be a bentgrass for hot, dry summer conditions, which can survive in midwestern lawns which must be clipped closely, without all the meticulous care generally required for creeping bentgrasses. Maybe here is a cultivar among lawn grasses which satisfies a condition against which Gleason Matoon in his *Horticultural Newsletter* takes umbrage for ornamentals generally: "How different from the newer hybrids these old favorites (speaking of ancient planting noted on farms). (Newer types) are precocious and colorful, but they lack qualities we long for in flowering shrubs and garden perennials. More especially we ponder on the continual urging to spray, prune, protect, fertilize, weed, and cultivate. Do the new kinds require such babying? If so, forgive us for longing for plants which will persist with neglect and continue to fulfill their roles in this complex world, without the necessity for giving them a daily injection or feeling their pulse weekly."

<sup>1</sup> Hyslop and Schoth recognized it as a distinctive "variety" in 1926. The first seed was harvested in 1927 from a volunteer stand. Certification status was accorded in 1934.

<sup>2</sup> Harry A. Schoth, Professor Emeritus at Oregon State University, an outstanding expert on Highland bent, states: "Highland bent is very versatile, so far as soils are concerned. It is considered as perhaps the most satisfactory of the bents for low fertility soils and soils that may get quite dry during some periods of the year. . . . on the other hand, it will succeed on lands that may be quite wet during portions of the year. . . . Its use for turf is the result of wide adaptability, ability to withstand heavy abuse, generally satisfactory color, texture and appearance, comparative freedom from disease and insect attack, and good sod-forming ability that will stand heavy tramping without lasting injury."

### RECENT LETTER TO THE EDITOR FROM DR. ROBERT SCHERY.

It seemed apparent that little or no *Poa annua* contaminates Highland bentgrass in its main growing area, the Silverton Hills on the east slope of the Willamette Valley near Salem, Oregon. Dr. Schery supposes that several factors are involved. For one thing in this particular area, where highland is so well adapted, it probably crowds the poa pretty well. Additionally, *Poa* probably does not do so well on well drained hills, and is not ecologically favored there. Also farmers take pains not to introduce *Poa*.

In 100 samples taken, there was not a single case