

1989 WEED CONTROL, PGR, AND MANAGEMENT UPDATE
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This report will describe relevant field research conducted during 1989 at the Hancock Turfgrass Research Center and other sites around the state of Michigan. Topics include variety trial evaluations, fairway conversion studies, annual grass weed control, and broadleaf weed control.

1989 VARIETY TRIAL RESULTS

A trend which seems to be accelerating at a rapid pace is the release of new turfgrass varieties. These varieties come largely from private plant breeding companies. For many years people in the industry have talked about "variety dilemma" which meant that there were so many varieties available that it was difficult to choose which ones to use in a seeding mix. This problem has increased steadily and has been helped by chronic seed supply shortages during the mid-1980's. If anything, it appears that the number of new varieties is growing at a faster rate than during the period when the term "variety dilemma" was coined. This is especially true for the perennial ryegrasses and the tall fescues. Data in tables 1-3 display the 1989 quality ratings for USDA national evaluations of Kentucky bluegrasses, perennial ryegrasses, and tall fescues. For the tall fescue varieties in table 1, notice that 6 out of the first 14 top varieties are experimentals. Look for most of these varieties to be available within the next 2-3 years. The new varieties generally set higher levels of quality, but the problem is often one of availability. Varieties that rank near the top of the USDA evaluations tend to be in high demand. Often the golf course superintendent or lawn care operator only has access to some of the older, more common varieties. Our advice to purchasers of grass seed is to use these results as guides in the selection of varieties. Generally, if you stick with varieties in the top 25% of the varieties in these trials you'll end up with high quality turf.

The perennial ryegrasses in table 2 also show some new varieties, although many of top performing varieties are already commercially available. Many of the perennial ryegrasses have the II designation such as Manhattan II or Dasher II. These designations generally mean that these selections are primarily from the original plant material and have been selected for improved disease resistance, better color, etc. However, there are no rules on what constitutes a II designation, so there is no assurance that these varieties are similar to the original variety.

The Kentucky bluegrasses continue to provide the highest quality grasses for the temperate region of our country. The data in table 3 shows the highest ranking varieties for 1989. Princeton 104 is a variety that is exceptionally uniform as well as having excellent dark green color. Midnight is notable because it is probably the darkest green of all the available Kentucky bluegrass varieties. Shortages of bluegrasses can be a problem not only because of the effects of demand but because the bluegrasses are not strong seed producers. In fact, some of the best looking experimental varieties have never become commercially available because they simply could not produce enough seed per acre to justify marketing them.

A variety trial was established in 1987 at Traverse City Country Club to look at bentgrasses, perennial ryegrasses, and fine fescues as fairway grasses in the Northern Michigan climate. Results for 1989 are shown in table 4. Surprisingly, the perennial ryegrasses are performing very well in Northern Michigan. All of the top 15 entries are perennial ryegrasses with the bentgrasses showing dramatically worse visual quality scores. Combinations of perennial ryegrass plus creeping bentgrass performed well and may be a way to reduce fairway disease problems by diversifying the number of species present. As mentioned above, this trial was initiated in August of 1987 and it is still too early to make recommendations since the concern with ryegrasses in this climate is winter kill and several more winters are needed before we would feel comfortable recommending ryegrasses for Northern Michigan.

ANNUAL GRASS WEED CONTROL

The prospect of several new grass herbicides for the turf market has created much interest in these products over the last several years. Our research has centered on two new products, dithiopyr (trade name Dimension, also known as MON-15100) and quinclorac (trade name Impact, also known as BAS 514) which should be on the market by 1990 or 1991. Dithiopyr is a primarily a preemergence herbicide although it also has significant postemergence activity. Quinclorac is principally a postemergence grass herbicide although it has significant preemergence grass activity as well as good postemergence broadleaf activity. Clearly, quinclorac has broad spectrum of herbicidal activity which will make it a unique product for the turf market. Data in table 5 displays the results of the preemergence trial for 1989. Dithiopyr (MON-15100) gave 100% control at all rates tested except for the 0.25 lb/A rate of the granular formulation and the 0.38 lb/A rate of the EC formulation. Even these rates gave excellent control, but not 100% as did the other rates. Another new preemergence herbicide is prodiamine, which is from Sandoz Crop Protection Corp., and also gives excellent preemergence control.

Table 1. 1989 Tall Fescue Variety Trial Evaluations.

Variety	Quality Ratings (1-9)							Grand Means
	5/15	6/13	7/11	8/12	9/15	10/11	11/15	
Pick 127	6.0	6.8	6.7	7.5	7.0	6.8	4.7	6.5
Pick DM	6.0	6.5	6.3	6.7	7.0	6.8	5.7	6.4
Eldorado	5.7	6.5	6.3	7.0	7.5	6.3	5.5	6.4
Tribute	6.2	5.8	6.2	6.7	7.2	6.5	5.7	6.3
Hubbard 87	6.3	6.5	6.2	7.0	6.7	6.5	4.8	6.3
PST-5MW	5.5	6.0	6.3	6.7	6.5	7.2	5.8	6.3
Cimmaron	6.3	6.2	6.0	6.5	6.7	6.3	5.7	6.2
Aztec	5.5	6.3	6.5	6.5	6.8	6.7	5.2	6.2
Pick GH6	5.8	6.0	6.0	6.5	7.2	6.8	5.2	6.2
Normac 99	6.2	6.7	5.5	6.5	7.0	6.5	5.0	6.2
Pick TF9	6.0	6.2	6.2	7.0	6.8	6.2	5.0	6.2
Jaguar II	5.8	6.0	6.0	6.2	6.7	6.5	5.7	6.1
Trailblazer	6.2	6.0	6.0	6.3	6.2	6.0	6.0	6.1
Pick 127	6.0	6.2	6.0	6.8	7.0	6.0	4.7	6.1
Bonanza	5.8	5.8	6.0	6.5	6.8	6.5	5.0	6.1
KWS-DUR	5.5	6.2	6.3	7.0	6.7	6.0	4.8	6.1
Legend	6.0	6.0	6.5	6.3	6.8	5.3	5.5	6.1
Wrangler	5.3	6.2	6.3	6.2	6.5	6.2	5.7	6.0
Winchester	6.0	6.2	5.7	6.5	6.5	6.2	5.3	6.0
Bel 86-1	5.5	6.0	6.0	6.5	6.5	6.7	5.0	6.0
PST-5AG	5.7	6.0	6.5	6.3	6.2	6.3	5.0	6.0
Emperor	5.8	6.2	6.2	6.2	6.0	6.2	5.3	6.0
Taurus	5.5	6.0	6.3	6.0	6.3	6.2	5.3	6.0
Bel 86-2	6.0	6.2	6.2	6.2	6.7	5.5	5.0	6.0
Rebel II	5.7	5.7	6.0	5.8	6.3	6.5	5.7	6.0
PST-50L	5.7	5.7	6.0	5.8	6.0	7.0	5.3	5.9
Rebel	5.7	5.7	5.8	5.7	6.5	6.5	5.7	5.9
PST-5AP	5.8	6.2	5.7	6.5	6.3	6.0	5.0	5.9
Sundance	5.8	5.7	6.2	6.3	6.3	6.2	5.0	5.9
Pick 845PN	5.5	6.0	5.8	5.8	6.7	6.3	5.0	5.9
Thoroughbred	5.7	5.3	5.8	5.7	6.8	6.5	5.3	5.9
Monarch	5.8	5.7	5.5	6.5	5.8	6.7	5.0	5.9
PST-5EN	5.2	5.7	6.2	6.0	6.2	6.3	5.5	5.9
JB-2	5.2	5.3	6.0	6.2	6.0	6.7	5.7	5.9
Trident	6.0	5.5	5.7	6.3	6.3	5.7	5.3	5.8
PE-7	5.7	6.2	6.0	5.8	5.8	6.3	5.0	5.8
Normac 77	5.5	5.8	6.0	6.0	6.7	6.0	4.7	5.8
PST-DBC	5.3	5.2	6.3	6.0	6.3	6.7	4.7	5.8
Falcon	5.3	5.2	5.7	6.2	6.3	6.2	5.7	5.8
Mesa	5.8	5.7	5.7	6.0	6.2	6.2	5.0	5.8
Amigo	5.5	5.3	6.2	6.2	6.5	5.7	5.0	5.8
Silverado	4.7	5.8	5.7	6.2	6.3	6.3	5.3	5.8
Olympic	5.3	5.7	6.2	5.7	6.5	6.0	5.0	5.8
Carefree	5.7	5.7	5.7	6.0	6.0	6.2	5.2	5.8
Arid	4.7	5.2	5.3	5.8	6.5	7.0	5.7	5.7
PST-5DM	5.2	6.0	6.0	5.8	6.0	6.7	4.5	5.7
Tip	5.0	5.3	5.7	6.3	6.3	6.3	5.0	5.7
Apache	5.5	5.7	5.7	6.0	5.8	6.0	5.0	5.7
Syn Ga	5.7	5.8	6.0	6.0	5.8	5.7	4.5	5.6
Finelawn 1	5.2	5.0	6.2	5.8	6.3	6.0	5.0	5.6

Table 1. cont. 1989 Tall Fescue Variety Trial Evaluations.

Variety	Quality Ratings (1-9)							Grand Means
	5/15	6/13	7/11	8/12	9/15	10/11	11/15	
Jaguar	5.5	5.5	5.5	5.8	5.9	6.2	5.0	5.6
Titan	5.8	6.0	5.8	5.7	6.2	5.5	4.3	5.6
Richmond	5.3	5.0	5.7	5.7	6.3	6.3	5.0	5.6
Willamette	6.0	5.0	6.0	5.7	6.0	5.5	5.0	5.6
Adventure	5.0	5.0	5.5	5.7	6.2	6.2	5.5	5.6
FineLawn 5GL	5.2	5.7	6.0	5.8	5.8	5.7	4.7	5.5
PST-50L	4.8	5.7	5.3	5.7	5.9	6.0	5.1	5.5
Fatima	5.0	5.5	6.0	5.2	6.3	5.3	5.0	5.5
Chieftan	5.8	5.5	5.7	5.8	6.0	4.3	5.0	5.5
Pacer	5.3	5.0	5.3	5.8	5.5	5.7	5.0	5.4
KY-31	4.7	5.0	5.2	5.5	5.7	6.5	4.8	5.3

Table 2. 1989 Perennial Ryegrass Variety Trial Evaluations.

Variety	1989 Quality Ratings (1-9)								Grand Means
	4/26	5/16	6/12	7/11	8/15	9/14	10/11	11/14	
Saturn	5.7	6.3	6.0	5.2	7.0	6.5	6.0	4.8	5.9
PST-2H7	4.7	5.8	6.2	5.0	6.3	6.3	6.0	5.5	5.7
Allaire	5.3	6.0	5.7	4.3	5.8	6.0	5.8	5.3	5.5
Manhattan II	4.7	5.8	6.0	4.0	6.7	6.3	5.3	5.2	5.5
Palmer	4.7	6.0	5.7	5.2	5.5	5.8	6.0	5.2	5.5
Pennant	4.8	5.7	5.8	5.0	6.0	6.3	5.2	4.8	5.5
Tara	4.3	5.8	5.7	5.2	6.5	6.3	5.3	4.5	5.5
Belle	5.2	6.3	5.3	4.3	6.0	6.0	5.8	4.7	5.5
Runaway	4.8	6.2	6.5	4.3	5.5	5.5	5.5	5.2	5.4
Regal	5.3	5.3	5.3	5.0	5.7	6.5	5.0	5.3	5.4
Charger	4.3	6.0	5.7	4.3	6.2	6.2	5.7	5.0	5.4
SR 4100	4.3	6.0	5.7	4.7	6.0	6.2	6.2	4.3	5.4
Dasher II	4.3	5.7	5.3	4.0	6.5	6.5	5.7	5.0	5.4
SR 4000	4.0	5.5	5.8	4.0	6.2	6.2	5.8	5.5	5.4
Riveria	4.0	5.3	5.7	4.3	6.2	6.3	5.3	5.5	5.3
Lindsay	4.3	6.2	5.7	4.0	5.7	6.0	5.5	5.2	5.3
Bar Lp 410	4.7	5.8	6.2	4.8	6.0	5.8	5.0	4.0	5.3
Omega II	4.7	5.7	6.0	4.3	6.0	6.0	5.5	4.0	5.3
PST-2DD	4.5	6.0	4.7	4.0	6.2	6.2	6.0	4.7	5.3
PST-M2E	4.3	6.2	5.8	4.3	6.0	6.0	5.7	3.7	5.3
Competitor	4.7	6.0	5.7	4.0	5.8	6.0	5.7	4.2	5.3
Blazer II	4.3	6.2	6.3	5.0	4.8	6.0	5.5	3.7	5.2
Citation II	4.3	6.5	4.7	4.0	5.8	6.2	5.7	4.7	5.2
Prelude	4.7	5.8	5.3	4.3	5.5	5.8	5.7	4.3	5.2
Barry	4.3	5.7	5.3	4.3	5.8	5.7	5.2	5.0	5.2
Cowboy	4.8	6.2	5.0	4.0	5.8	6.0	5.3	4.2	5.2
Rodeo	4.3	5.2	6.0	4.2	5.7	5.8	4.8	5.3	5.2
Repell	3.7	5.0	6.0	4.3	5.8	6.0	5.5	5.0	5.2
Aquaris	4.0	5.3	5.7	4.3	6.0	5.8	5.8	4.3	5.2
NK 80389	3.3	5.0	6.7	5.0	5.5	5.2	6.0	4.7	5.2
Derby	4.7	5.7	5.3	4.7	5.7	5.7	5.0	4.5	5.1
Birdie II	4.0	5.7	5.3	5.0	5.8	5.8	5.2	4.3	5.1
Brenda	5.0	5.5	5.3	5.0	5.3	5.7	5.0	4.2	5.1
PSU-333	4.0	6.3	5.0	4.7	5.7	6.0	5.3	4.0	5.1
Rival	4.0	4.7	5.7	5.2	5.7	5.7	5.3	4.8	5.1
Sunrye	4.7	6.2	4.0	3.7	6.0	5.5	5.3	5.2	5.1
Yorktown II	4.0	5.3	5.8	4.3	5.3	5.3	5.0	5.2	5.0
Manhattan	4.0	5.3	5.8	4.2	5.5	5.0	5.2	5.2	5.0
Commander	4.0	5.7	4.7	4.7	6.0	5.8	5.3	4.0	5.0
Goalie	4.3	6.0	4.3	3.3	5.8	6.2	5.3	4.7	5.0
Ranger	3.7	4.7	5.7	4.3	5.3	5.8	5.3	5.0	5.0
Fiesta II	3.7	5.7	5.3	4.0	6.0	5.7	5.7	3.7	5.0
Del 946	4.7	6.2	4.7	3.8	5.8	6.0	4.7	3.7	4.9
Pick 715	4.0	5.8	5.3	3.7	5.2	5.5	5.3	4.7	4.9
PSU-222	4.5	5.3	5.7	3.7	5.0	5.7	5.3	4.3	4.9
Pennfine	4.3	5.3	4.7	5.0	5.3	5.5	5.3	4.0	4.9
SR 4031	4.7	5.7	4.7	3.7	5.8	5.7	5.3	4.0	4.9
Regency	4.7	5.0	4.7	3.3	5.7	6.0	5.3	4.5	4.9
Vintage	4.3	5.3	5.0	4.3	5.7	5.5	4.7	4.3	4.9
Acrobat	4.0	5.3	5.0	4.2	5.3	6.0	5.0	4.2	4.9

Table 2. cont. 1989 Perennial Ryegrass Variety Trial Evaluations.

Variety	1989 Quality Ratings (1-9)								Grand Means
	4/26	5/16	6/12	7/11	8/15	9/14	10/11	11/14	
Gator	3.5	5.3	6.2	4.2	4.8	5.7	5.3	4.0	4.9
Ovation	4.0	4.5	5.7	5.2	4.7	5.2	5.2	4.3	4.8
Dillon	3.7	4.7	5.8	4.7	5.0	5.3	4.7	4.7	4.8
Mom-Lp-763	3.7	5.0	5.7	4.0	5.3	5.3	5.2	4.3	4.8
Patriot	3.7	5.0	5.0	4.0	5.7	5.7	5.0	4.2	4.8
Ronja	3.7	4.7	6.5	4.0	4.7	4.7	5.0	4.8	4.8
Bar Lp 454	4.0	5.0	5.8	4.2	4.7	5.0	4.0	5.0	4.7
Caliente	3.7	5.5	5.0	4.0	5.2	5.3	5.2	3.8	4.7
J208	3.0	4.3	6.0	4.0	5.0	5.0	5.3	4.5	4.6
Diplomat	3.7	4.7	5.0	3.5	4.8	5.0	5.3	5.2	4.6
J207	3.7	5.3	5.0	4.0	5.2	4.7	4.7	4.3	4.6
Sheriff	4.2	5.3	4.7	3.7	4.7	5.2	4.8	4.3	4.6
Delray	3.7	5.5	4.7	3.7	5.5	5.3	4.3	3.3	4.5
Pavo	4.0	4.7	5.0	4.0	5.0	4.7	4.5	4.0	4.5
Linn	2.7	4.0	3.7	3.0	4.0	4.3	3.2	4.5	3.7

Table 3. 1989 Kentucky Bluegrass Variety Trial Evaluations

Variety	Quality Ratings (1-9)								Grand Means
	4/24	5/15	6/13	7/10	8/14	9/14	10/9	11/14	
Princeton 104	3.7	6.0	7.7	7.3	7.8	7.8	8.3	6.7	6.9
Asset	4.3	6.7	6.5	6.2	7.3	7.0	6.5	6.3	6.4
Eclipse	4.0	6.3	6.8	6.7	7.0	6.7	6.7	6.5	6.3
Challenger	4.2	6.3	6.5	5.3	7.0	6.8	6.8	6.7	6.2
Midnight	3.0	6.0	6.8	5.3	7.0	6.2	7.5	7.3	6.1
Lofts 1757	4.3	6.0	6.3	6.3	6.7	6.7	6.0	6.0	6.0
PST-CB1	4.3	6.0	5.7	5.7	6.2	6.7	7.0	6.2	6.0
Aspen	3.7	5.0	6.2	6.2	7.0	7.0	6.3	6.3	6.0
Bristol	4.5	6.7	6.0	5.7	5.3	6.7	5.8	6.5	5.9
K3-178	4.7	5.8	6.0	5.7	6.2	6.7	6.7	5.5	5.9
Parade	4.5	5.0	5.7	5.5	6.0	6.8	7.2	6.3	5.9
Adelphi	4.7	6.0	6.0	5.7	6.5	6.3	6.2	5.5	5.9
Destiny	4.5	5.2	6.0	6.2	6.5	6.3	5.8	6.2	5.8
Freedom	4.3	6.0	6.0	6.0	5.8	6.5	6.3	5.7	5.8
Glade	4.0	6.0	6.3	5.3	5.5	6.8	5.8	6.7	5.8
Abbey	4.0	6.3	6.2	6.5	5.5	6.5	6.0	5.3	5.8
BA69-82	4.3	5.2	6.2	6.8	7.0	6.2	5.5	5.0	5.8
Cheri	4.0	5.3	6.5	6.8	6.8	5.8	5.2	5.5	5.8
Wabash	4.8	5.0	5.3	6.5	6.5	6.0	6.3	5.5	5.8
BA73-540	3.8	5.7	6.2	6.7	7.2	6.0	5.5	5.0	5.8
Dawn	4.0	5.3	5.7	5.7	6.3	6.3	5.8	6.5	5.7
RAM 1	4.3	4.7	6.5	5.7	6.5	5.8	6.2	5.8	5.7
Huntsville	5.0	5.0	5.0	6.0	6.7	6.0	5.8	5.8	5.7
Trenton	3.8	5.3	6.2	5.8	6.0	6.2	6.7	5.2	5.6
Touchdown	4.0	6.2	5.7	4.7	6.3	6.0	6.0	6.2	5.6
K1-152	3.7	5.7	6.0	5.3	6.0	6.2	6.2	5.8	5.6
Mystic	4.7	4.7	6.8	6.7	5.7	5.2	5.2	6.0	5.6
Blacksburg	3.0	4.3	7.0	5.3	7.3	7.2	5.5	5.0	5.6
Classic	3.7	5.2	5.7	6.0	6.7	6.8	5.3	5.3	5.6
Victa	3.7	5.5	6.3	6.2	6.2	6.0	5.3	5.2	5.5
Ba-70-242	4.2	5.8	6.3	6.2	5.7	5.5	5.3	5.3	5.5
NE 80-88	5.0	5.3	5.7	5.3	5.7	5.3	6.3	5.5	5.5
Suffolk	4.0	5.8	5.7	5.7	5.2	6.2	5.8	5.7	5.5
Gnome	4.3	5.8	5.8	5.8	6.5	5.2	5.3	5.2	5.5
Monopoly	5.0	4.3	6.0	5.7	5.5	5.8	6.2	5.3	5.5
WW AG 468	3.0	6.5	6.2	6.2	6.3	6.0	5.7	4.0	5.5
Georgetown	4.3	6.3	5.3	5.3	5.5	6.0	5.7	5.2	5.5
Haga	4.0	5.0	5.3	5.8	5.8	6.3	6.0	5.3	5.5
Tendos	3.8	4.5	5.0	5.7	6.3	6.0	5.8	6.5	5.5
Somerset	3.7	4.0	5.3	6.0	6.3	5.8	6.7	5.8	5.5
America	3.5	5.2	5.3	6.2	5.3	6.3	6.2	5.3	5.4
South Dakota Cert.	5.0	4.7	5.0	5.3	6.0	6.2	5.7	5.3	5.4
Ba-73-626	3.7	6.0	6.0	6.2	5.7	5.3	5.3	5.0	5.4
Liberty	4.0	5.7	5.7	5.5	5.2	6.3	5.2	5.5	5.4
Merion	3.3	4.7	5.7	6.2	6.7	5.5	6.0	5.0	5.4
Able-1	3.3	4.0	6.3	6.0	6.2	6.2	5.7	5.3	5.4
Majestic	4.0	5.3	5.0	6.0	5.7	6.0	5.7	5.2	5.4
Sydsport	4.2	5.5	6.0	5.7	6.5	5.7	5.0	4.2	5.3

Table 3. cont. 1989 Kentucky Bluegrass Variety Trial Evaluations

Variety	Quality Ratings (1-9)								Grand Means
	4/24	5/15	6/13	7/10	8/14	9/14	10/9	11/14	
Coventry	3.7	5.2	5.7	6.3	6.0	6.0	4.8	5.0	5.3
Merit	3.7	5.2	5.8	5.5	5.5	5.7	5.5	5.3	5.3
Joy	5.2	5.7	4.7	5.0	5.8	5.3	5.3	5.2	5.3
Nassau	4.0	4.7	6.0	5.3	6.2	5.5	5.5	4.7	5.2
Rugby	3.5	5.0	5.3	6.0	5.7	5.7	5.5	5.0	5.2
Aquila	3.7	4.7	5.0	5.5	5.7	4.7	5.5	6.7	5.2
WW Ag 496	4.0	5.3	6.0	5.2	5.2	5.7	5.0	5.0	5.2
HV 97	3.3	4.7	5.3	5.7	5.3	6.0	5.3	5.5	5.1
Kenblue	5.0	4.0	4.7	5.3	6.0	5.5	5.2	5.3	5.1
Chateau	3.8	4.2	5.8	5.8	6.2	5.7	4.7	4.8	5.1
Bar VC 577	4.0	4.3	4.7	5.3	5.7	5.7	5.7	5.5	5.1
WW Ag 491	3.7	4.7	5.7	5.7	5.5	5.2	5.2	5.2	5.1
Harmony	3.2	4.7	5.7	5.2	6.0	5.3	5.0	5.5	5.1
Welcome	4.0	4.0	5.8	5.7	5.0	5.0	5.2	5.3	5.0
Conni	3.3	3.3	5.7	5.3	6.0	5.7	5.3	5.2	5.0
Compact	3.8	4.5	5.2	5.8	5.3	5.3	4.7	4.7	4.9
Baron	3.5	4.7	5.7	6.0	5.3	5.2	4.3	4.3	4.9
A-34	3.3	4.7	6.0	5.0	4.8	5.0	5.3	4.7	4.9
Amazon	3.0	3.7	5.8	5.0	5.0	5.3	5.2	5.2	4.8
Ikone	3.7	3.7	5.0	4.3	5.2	6.0	5.2	5.2	4.8
Estate	3.3	4.2	6.2	5.0	5.2	5.2	4.3	4.7	4.8
Barzan	3.3	4.0	4.3	5.0	5.3	5.2	5.0	5.7	4.7
WW Ag 495	3.5	4.0	5.7	5.3	5.2	4.7	4.7	4.7	4.7
Cynthia	3.3	3.7	4.3	4.7	5.5	5.8	5.0	5.3	4.7
Julia	3.0	4.0	5.7	5.0	5.7	4.8	4.5	4.7	4.7
Bar VB 534	2.7	3.7	4.7	5.0	5.3	5.2	4.0	5.0	4.4
Annika	2.7	3.0	4.0	4.7	5.0	5.2	4.3	4.0	4.1

Table 4. Traverse City fairway trial 1989 data.

<u>Variety</u>	<u>Species</u>	<u>5/11</u>	<u>6/15</u>	<u>7/19</u>	<u>10/26</u>	<u>Grand Means</u>
Fiesta	PR	7.3	8.0	6.7	6.0	7.0
Manhattan II	PR	7.2	8.0	6.8	5.5	6.9
Blazer	PR	7.0	8.5	6.7	5.0	6.8
Gator	PR	6.7	8.0	6.2	6.2	6.8
Palmer + Penncross	PR + CB	6.8	8.0	6.3	5.3	6.6
Saturn	PR	6.7	7.5	6.2	5.8	6.5
Palmer	PR	6.5	7.7	6.2	5.7	6.5
Fiesta II	PR	6.3	8.2	6.2	5.2	6.5
Lindsay	PR	6.3	7.7	5.7	5.8	6.4
Derby	PR	6.7	7.8	6.0	4.5	6.3
Pennant	PR	6.5	6.3	5.7	6.0	6.1
Dillon	PR	5.8	7.2	6.3	5.0	6.1
Allstar	PR	6.5	6.7	5.5	4.8	5.9
Palmer + Penncross + Exeter	PR + CB + ColB	5.5	6.8	5.5	5.3	5.8
Dasher II	PR	6.0	6.0	5.2	5.8	5.8
Birdie	PR	6.0	6.0	5.7	5.2	5.7
Yorktown II	PR	5.8	6.8	5.5	4.3	5.6
Penncross	CB	4.3	7.3	5.8	4.5	5.5
Omega II	PR	5.3	6.7	5.2	4.7	5.5
Ovation	PR	5.3	6.0	5.3	5.2	5.5
Pennlinks	CB	4.3	7.2	5.8	4.3	5.4
Prelude	PR	5.5	5.3	4.7	4.7	5.0
Cobra	CB	4.0	6.7	4.5	4.8	5.0
Regal	PR	5.2	5.7	4.3	4.2	4.8
Putter	CB	3.7	6.7	3.8	4.5	4.7
Jazz	PR	5.3	5.3	4.2	3.7	4.6
Penneagle	CB	3.7	6.3	3.8	3.8	4.4
National	CB	4.0	4.3	4.0	4.5	4.2
Citation II	PR	4.2	5.0	3.7	3.8	4.2
Spartan	HF	3.0	4.5	3.5	4.0	3.8
Scaldis	HF	3.3	3.3	3.0	4.0	3.4
Shadow	ChF	2.3	4.0	3.0	3.7	3.3
Cindy	CrF	2.7	3.7	3.0	3.3	3.2
Highland	ColB	2.3	3.7	2.2	3.2	2.8
Exeter	ColB	2.2	3.7	2.7	2.7	2.8
Tournament	HF	2.0	3.2	2.7	3.2	2.8
Aurora	HF	2.3	2.7	2.5	3.2	2.7
Serra	HF	1.7	2.3	2.3	4.2	2.6
Flyer	CrF	1.7	2.7	2.0	2.8	2.3
Fortress	CrF	1.7	1.3	1.7	3.0	1.9