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Committee on Planning and Development

Testimony Submitted by Gregory A. Foran, Parks Superintendent, Town of Glastonbury

SUPPORT
Proposed HB 5155
An Act Modifying the Ban on Pesticide Applications on School Grounds

I urge you to pass House Bill 5155 as it will protect children and budgets at the same time. Much has been said in the past to infer that there needs to be a choice between attractive fields and safe fields. In truth, they are one and the same.

Attractive fields are safe fields. Fields with dense cover have a lower incidence of sports injuries. A research study conducted by Dr. William Dest, (a Professor Emeritus from our own University of Connecticut) and Scott Ebdon of UMASS is attached. In this published study, Dr. Dest and Dr. Ebdon show that fields that have denser turf have a clear correlation with a decreased incidence of injuries. Dense turf is safe turf.

In another study, conducted in Manchester, CT by the Parks and Recreation Department with funding by DEEP and oversight by DEP and NOFA, IPM managed fields were shown to produce a denser and more weed free turf than those managed with organic inputs. This data, attached to my testimony, was collected and assessed, scientifically and independently in blind studies by Dr. Dest. I helped collect that data without any knowledge of which fields were IPM maintained and which were organically maintained. As I have stated, the IPM fields clearly outperformed the organic fields.

The results of these studies show:

1. Better turf (dense cover) = fewer injuries.
2. IPM results in better turf than organic care.
3. IPM produces safer fields than organic care.

The costs of organic turf care and the cost of no care are astounding. I have also attached, for your perusal, a few real life examples of costs comparing organics to IPM measures. I would be glad to cite these examples or discuss them as time allows.

The original legislation banning the use of IPM methods should never have been passed as it was an unfunded mandate. I believe the committee who reviewed the legislation may have erred by allowing themselves to consider that doing nothing ay all might be an option. Doing nothing at all would be irresponsible and would allow for the rapid deterioration of playing fields. Unfortunately, some people have been faced with that option due to the high cost of the few organic options available. In many cases there aren't any organic options available and in some others, even the organic option is against the current law. The right term under the law for allowable control measures is not organic, but "exempt".

Please see the attached sheet for a better understanding of the differences in "organic" controls versus "exempt" and as compared to IPM options.

Thank you for the opportunity to address you today. My business card is attached and I welcome any questions here or in the future relative to this issue. Thank you for your consideration of my views. Once again, I ask that you support this legislation and remove the unfunded mandate which prevents municipalities from serving our residents.

Gregory A. Foran

HB-5155 – SUPPORT

An Act Modifying the Ban on Pesticide Applications on School Grounds

February 22, 2012

This packet contains the following documents as backup information to my testimony in SUPPORT of HB 5155:

1. Re-print of Study cited in Testimony by Dr. William Dest, UCONN Emeritus and Dr. Scott Ebdon, UMASS.
2. Data from Dr. Dest assessing Organic versus IPM Turf Care at Veterans Memorial Fields in Manchester, CT.
3. Synthetic Field Costs
4. Weed Control and Crabgrass Control Costs
5. Grub Damage in Glastonbury After the Ban
6. Grub Control Costs
7. Field Renovation Methods and Costs After the Ban
8. Fertilizer Costs Organic versus IPM
9. Poison Ivy Exposure – Immeasurable Costs

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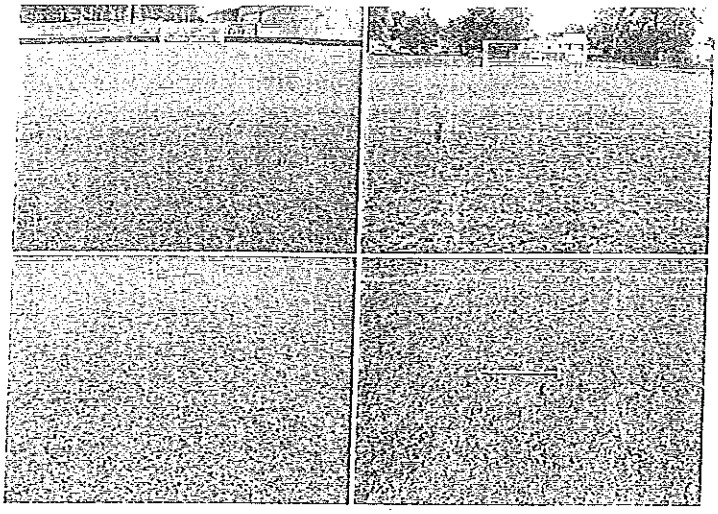


>> Figure 1. PANELS TO THE LEFT show high maintenance soccer field while the panels to the right show low soccer maintenance field receiving the same level of use of 146 hours for the season.

Surface smoothness and overall field quality also improved as the bulk density increased ($r = 0.81$ and $r = 0.58$, respectively), largely a result of a firmer surface due to greater sand content. We previously had found a highly significant correlation between surface hardness and bulk density.

USE AND INJURIES

The only effect from hours of use was on turf density, hardness and penetration resistance. As the hours of use per year increased, turf density decreased while hardness and penetration resistance increased. A loss in turf density was related to an increase in player to surface injuries. This accounted for 39% of injuries related to the field surface with higher densities associated with fewer injuries. These results underscore the relative importance of sustaining higher turf density for better cushioning and safer playing surfaces. To that end, overall field quality increased with higher N with an average seasonal N rate in this study approaching 4.5 lbs per 1000ft2.

We found no relationship between overall field conditions and hours of use. See Figure 1 in which hours of use were the same for two fields but maintenance input differed. An increase in maintenance input was closely associated with an increase in shoot density, surface smoothness and overall field quality; the likely reason for fewer injuries being reported. Shoot density was the single most important factor accounting for 39% of field related injuries with higher densities associated with fewer injuries. ◻

W. M. Dest is Associate Extension Professor emeritus, University of Connecticut Storrs and sports turf consultant specializing in soil physical properties. J. S. Ebdon is Associate Professor of Turfgrass Management at the University of Massachusetts Amherst.

Results

1. Dense turf cover = less injuries.

2. IPM = denser turf than organic care or no care
(Manchester, CT pilot program funded by DEEP and assessed by Dr. Dest.)

3. IPM produces denser, safer turf than organic.

Study: Natural turf use levels

INJURIES ARE OF MAJOR CONCERN to parents, coaches and, of course athletes. Few studies have been conducted to relate actual field conditions as well as maintenance practices to reported injuries. We conducted a study in 2007 to determine the level of use that an athletic field will sustain before field conditions begin to affect the playability and safety of the field. Eleven sports turf managers from four New England states volunteered to take part in the study; they represented 12 varsity fields from nine high schools and three universities. Field use included football, soccer or both. Lacrosse was also played on two of the soccer fields.

The turf manager participants were given a form to record the date, event (game or practice) and hours/minutes of use. This provided the number of weeks the fields were in use for which we then calculated the total number of hours of use over the playing season. All participants provided their maintenance program, including nitrogen fertilization treatments, mowing height and frequency, aerification, dethatching, topdressing, overseeding, number of times chemicals were applied to control weeds, insects and/or diseases, and growth enhancement products used. The maintenance practices were quantified for statistical purposes. All the fields in the study were irrigated.

At the conclusion of the study, the participants asked their athletic departments about the number of injuries that could be contributed by players to surface contact; we did not solicit the type of injury. Nine of the 12 schools responded.

FIELD EVALUATIONS

The field surfaces were evaluated at the end of playing seasons for percent grass cover (turf density), percent weeds, surface smoothness, depressions (areas on the fields that can accumulate surface runoff), and stones at the surface. The characteristics evaluated were assigned code numbers (shown in Table 1) for the purpose of statistical analysis. Separate ratings were taken from the heavily trafficked center of the fields from goal to goal and the less trafficked areas along the sidelines. Overall field conditions were determined using the sum of ratings for grass cover and surface smoothness, with ratings for weeds, depressions and stones at the surface subtracted from the sum. The data shown in Tables 2 and 3 are from the heavily trafficked centers of the fields.

Further, we evaluated the quality of the playing surfaces by determining surface hardness, traction, and penetration resistance with separate measurements taken from

Table 1. Rating System with Codes.

Percent grass cover (turf density)	Percent weeds	Depressions
0 = 10%	1 = <10%	0 = none
1 = 11-20%	2 = 10-30%	1 = few
2 = 21-30%	3 = 31-50%	2 = moderate
3 = 31-40%	4 = >50%	3 = many
4 = 41-50%		4 = extreme
5 = 51-60%		
6 = 61-70%		
7 = 71-80%		
8 = 81-90%		
9 = >90%		

Smoothness

1 = surface is extremely uneven that will affect play and are hazardous
2 = surface is very uneven with irregularities that will greatly affect play
3 = surface is uneven with irregularities that will moderately affect play
4 = smooth surface with some irregularities
5 = smooth surface with no irregularities

Table 2. Mean and range for characteristics on 12 varsity fields from center of field from goal to goal (2007 playing season).

Variable (code or unit)	mean	minimum	maximum
Usage			
hrs./week	12.1	3.7	21.4
total for year	166.2	39.0	412.0
Field Rating[1]			
overall field condition	7.6	1.0	13.0
surface smoothness (1-5)	3.5	2.0	5.0
turf density (0-9)	6.3	3.0	9.0
weeds (1-4)	1.3	1.0	3.0
Playing Quality			
hardness (g max)	55.8	34.8	103.9
traction (Nm)	38.9	28.8	48.3
penetration resistance (MPa)	1.2	0.5	2.5
Soil Properties			
gravimetric moisture (%)[2]	25.1	12.0	36.7
soil available K lbs. per acre	177	93	216
soil available P lbs. per acre	24	2	45
bulk density (g per cm^3)	1.46	1.27	1.68
organic matter (%)	5.4	1.0	9.1
pH	5.8	5.5	6.5
sand (%)	74.2	55.7	95.0
Maintenance			
N fertilization lbs. per $1000ft^2$	4.4	2.0	6.0
total maintenance score	16.8	8.8	26.8

1 Density, smoothness, weeds, depression and stones at surface are factored into score for overall field quality condition.
2 Soil samples for soil moisture were collected on day when playing quality measurements were made.

the centers of the fields and along the sidelines. This data also was taken from the heavily trafficked centers (see Tables 2 and 3). Surface hardness was measured using a Clegg Impact soil tester, which is an accelerometer fastened to a 5-pound missile that is dropped from a height of 1 foot with the peak deceleration measured in gravities (Gmax). The higher the Gmax the harder the surface. Traction was measured by a device comprised of a 6-inch steel disc with six soccer studs spaced at intervals around the disc. The disc was weighted with 75 pounds and dropped from a 6-inch height so that the studs fully penetrated the surface. The torque required for the studs to tear the surface was measured in Nm (Newton meters). Penetration resistance was measured using a Penetrometer with a cone point. The cone point was pushed slowly and at a constant rate into the top 2 ½ inches of soil. Twelve readings were taken with each apparatus and then averaged.

SOIL SAMPLES

Soil samples were collected from each field to determine textural class based upon the USDA-NRCS classification system, soil organic matter content, soil available phosphorus (P) and potassium (K). Particle size for determining textural class was analyzed using the hydrometer method by separating the sand, silt and clay fractions. Percent organic matter was determined by weight loss on ignition. Soil available P and K were obtained using the modified Morgan extractant. Two intact core samples, 2 inches in diameter by 2 ½ inches in length, were taken from the center of the heavily trafficked area and two taken along the sidelines with a brass cylinder fitted inside a metal tube for determining bulk density. These results along with bulk density samples taken from the center of the fields are shown in Tables 2 and 3.

Table 3. Significant correlations (r) for data obtained for 12 athletic fields for 2007 playing season.

Co-variables	Correlation coefficient (r)
Field related injuries	
density x field related injuries	-0.62*
Field ratings	
density x weeds	-0.62*
density x smoothness	0.63*
density x overall field condition	0.88***
smoothness x overall field conditions	0.84**
Usage	
hours of use/yr. x density	-0.50†
hours of use/week x g max (hardness)	0.57†
hours of use/week x MPa (penetration resistance)	0.56†
Soil properties and field ratings	
sand x density	0.57†
sand x smoothness	0.88***
sand x overall field condition	0.69*
organic matter x smoothness	-0.68*
bulk density x smoothness	0.81**
bulk density x overall field condition	0.58†
soil moisture x traction	-0.80**
Between soil properties	
sand x organic matter	-0.85***
sand x K	-0.70*
organic matter x K	0.85***
bulk density x sand	0.93***
bulk density x organic matter	-0.89***
Maintenance factors	
N fertilization x overall field condition	0.60*
overall maintenance x density	0.69*
overall maintenance x smoothness	0.74**
overall maintenance x overall field condition	0.86***
Playing quality factors	
g max (hardness) x MPa (penetration resistance)	0.92***

†,*,**,*** Significant at $P \leq 0.10, 0.05, 0.01, 0.001$ levels, respectively.

STATISTICS

Correlation coefficients (r) were computed to identify relationships between ratings, hours of use, playing quality data, soil properties, maintenance practices and incidence of injury. Correlation is a measure of the strength of the association between two co-variables and is shown in Table 3. A perfect relationship or fit between two co-variables is indicated by an r value of "1" with values less than "1" indicating less than a perfect relationship. A negative sign (-) indicates an inverse relationship between any two co-variables. The degree of statistical significance of the correlation from weak to highly significant is indicated in Table 3 by the level of probability (P value) from weak ($P < 0.10$) to highly significant ($P < 0.001$).

FIELD QUALITY RATINGS AND MAINTENANCE

There was a wide range in field ratings for turf density, weed populations, smoothness and overall field conditions ranging from 3 to 9, 1 to 3, 2 to 5, and 1 to 13 respectively, Table 2. Turf density was positively related to smoothness (r = 0.63) and overall field conditions (r = 0.88), and negatively related to weed populations (r = -0.62) in which weed populations increased with progressively greater turf thinning and loss of density (Table 3). Percent weeds in two of the fields were 30% or greater, which also had the lowest scores for overall field quality conditions. Surface smoothness also had a major influence in improving overall field conditions (r = 0.84) Field maintenance had a considerable role in the condition of the fields. Turf density and surface smoothness increased significantly as maintenance inputs increased (r = 0.69), and (r = 0.74), respectively. Further, as maintenance factors increased, overall field quality increased (r = 0.86) with greater fertilizer nitrogen closely associated with improving overall field condition (r = 0.60).

SOIL PROPERTIES

The textural classes for the studied soils were classified as seven sandy loams with sand contents ranging from 55.7 to 74.3% sand, three loamy sands ranging from 79.2 to 83.2% sand, and two sand rootzones with 92% and 95% sand. Organic matter content in the 12 soils ranged from 1.0 to 9.1% by weight (Table 2). Bulk density values in the heavily trafficked centers ranged from 1.25 to 1.68 g cm-3 with bulk density increasing as the sand content increased (r = 0.93).

Moreover, as the sand content in the soil increased, smoothness of the surface increased (r = 0.88) and the overall field quality increased with greater sand content (r = 0.69). Field turf density also improved commensurate with an increase in sand content (Table 3). The improvement in turf density, smoothness, and overall field conditions are likely the result of better wear tolerance and a firmer surface as shown by our previous studies.

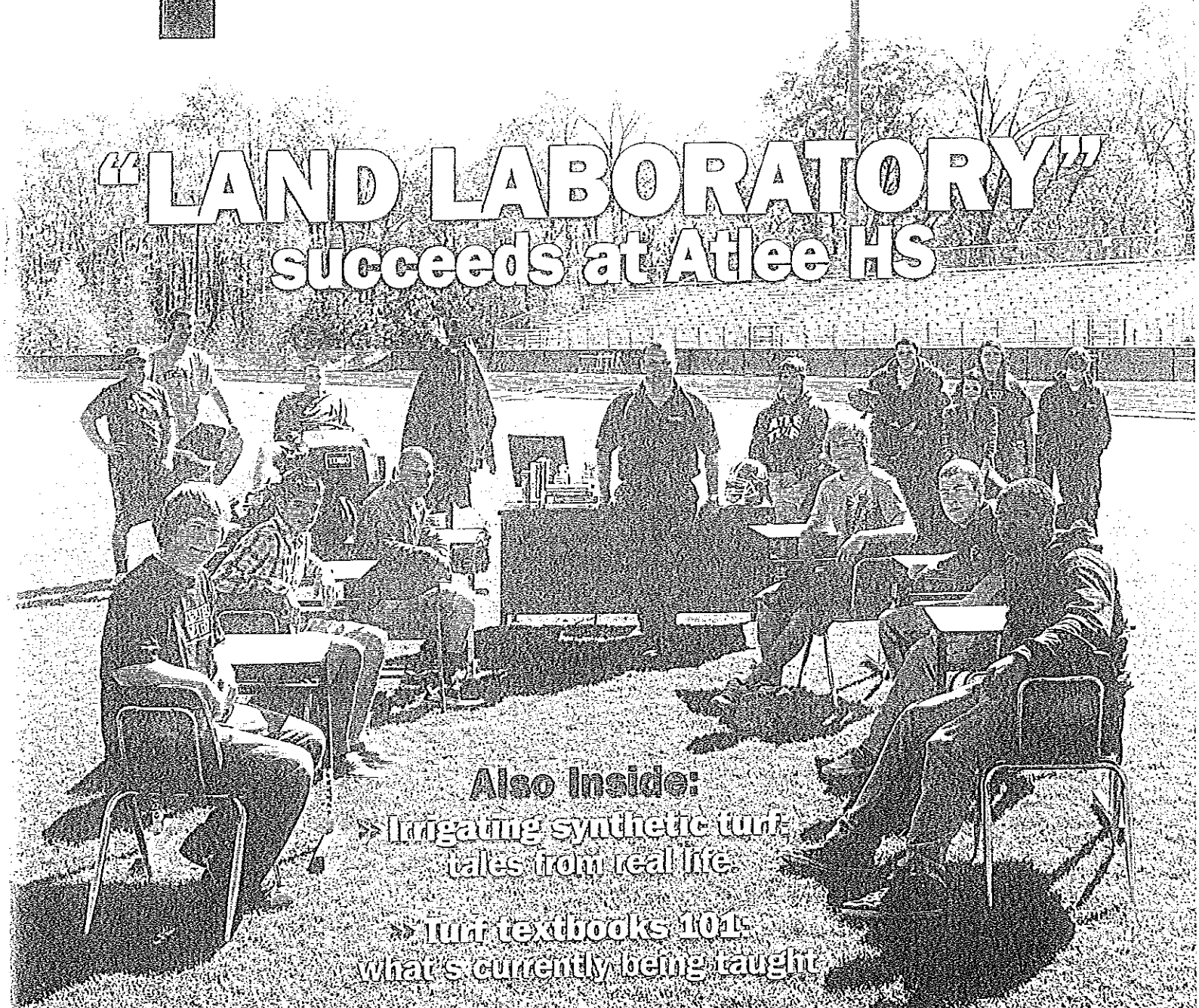
Magazine Cover - Report from Field Science

SPORTSFIELD AND FACILITIES MANAGEMENT

May 2011

SportsTurf

"LAND LABORATORY" succeeds at Atlee HS



Also Inside:

>> Irrigating synthetic turf: tales from real life

>> Turf textbooks 101: what's currently being taught

February 22, 2011

In **SUPPORT** of HB 5155 – An Act Modifying the Ban on Pesticide Applications at School Grounds

The data on the reverse side of this sheet shows that IPM maintained fields clearly outperformed organically maintained fields in the following areas:

1. Better Density (Turf Cover)
2. Fewer Weeds
3. Smoother Surface (Better playability)
4. Overall Field Conditions
5. Better Color – (Better appearance)

The study was set up in partnership with the Town of Manchester Park Division and the former CT DEP (now DEEP) who provide funding assistance and oversight. Additionally, NOFA was also instrumental in advising how the study should be set up.

The results provided here were collected by Dr. William Dest, Associate Extension Professor Emeritus at UCONN, and others working under his direct supervision. All parties collecting data and Dr. Dest did so "blindly, that is without knowledge as to which fields were maintained by organic means and which were done with traditional IPM methods.

Studies were done over several years, always blindly. Each year the results were similar with Treatment "A" outperforming Treatment "B". **With each successive year, the disparity between the areas treated through traditional IPM and those treated organically became more striking, with the IPM fields clearly more desirable.**

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Table 6. The mean ratings for turf density, percent weed population (%), surface smoothness, color, and overall field condition of the Manchester soccer fields at Hillstown Veterans Memorial Field for 2010, Organic Land Care Pilot Project

		May	August	November
		Density[5]		
	Treatments[2]			
IPM	A	7.9	8.2	7.5
Organic	B	5.9	7.0	4.7
	F test[3]	NS	NS	†
	cv%[4]	16.9	13.3	13.5
		Weed populations (%)		
IPM	A	12.0	25.0	8.0
Organic	B	33.7	42.9	44.2
	F test	NS	NS	*
	cv%	86.7	18.1	14.1
		Surface smoothness[6]		
IPM	A	3.9	3.8	3.8
Organic	B	3.4	3.4	2.3
	F test	NS	NS	NS
	cv%	10.6	11.3	36.0
		Overall field condition[7]		
IPM	A	3.9	4.1	3.8
Organic	B	2.8	3.1	2.1
	F test	NS	NS	NS
	cv%	15.7	11.5	20.6
		color[8]		
IPM	A	-	-	7.5
Organic	B	-	-	4.9
	F test	-	-	* *
	cv %	-	-	4.1

[1] Color rating was taken in November, 2010. This was the second time over the duration of the study when color differences were apparent between plots. See data, Table 3, 2008.
[2] Treatment A = conventional maintenance; Treatment B = organic land care
[3] †, *,**, NS, significant at P <0.10, P <0.05, P <0.01 and non-significant respectively
[4] Coefficient of variation
[5] Visual estimate of grass cover, 0 - complete loss to 10% of grass cover, 9 = greater than 90% grass cover
[6] 5 = smooth surface with no irregularities, 1 = a surface that is extremely uneven with holes and vegetative clumps that greatly affect play and is unsafe.
[7] 5 = excellent, 1 = unusable. Turf density, surface smoothness, percent weeds, field depressions and stones at the surface are factors in the rating for overall field condition.
[8] Color was determined visually on a scale of 1 to 9 with 1 = yellow to brown with no green, 9 = dark green

SYNTHETIC FIELD

SYNTHETIC FIELDS

- A Part of IPM
- $1,000,000 over 10 years is $100,000/Year
- $100.000/2.2 Acres = $45,455/Acre/Year
- Use These Fields as A Tool in Your Arsenal To Improve Your Natural Fields

WEED CONTROL COSTS

Product/Treatment	Cost per Acre
Three Way	$8.16
Confront	$28.08
Drive	$79.60
Hand Weeding:Burnout; Green Guardian	????; Total Kill – Not an option in most cases - $109.62/A

ROUNDUP/glyphosate **$19.50/Acre**

CRABGRASS CONTROL PRICES

Product	**Price per Acre**
Dimension	**$1.24 - $40.12* herbicide cost only**
Drive	**$79.60**
Acclaim	**$172.60**
Tupersan w/fert	**$275.73**
Corn Gluten	**$364.04**
***Dimension w/fertilizer**	**$127.68**

SKUNKS AND RACCOONS FORAGE FOR GRUBS

GRUB DAMAGE

GRUB CONTROL COSTS

Imidacloprid – Mallet – (Generic Merit) $57.50/A

Acelepryn - $155.00/A

Dylox - $156/A

Nematodes - $624/A (plus trapping mammals and damage repair)

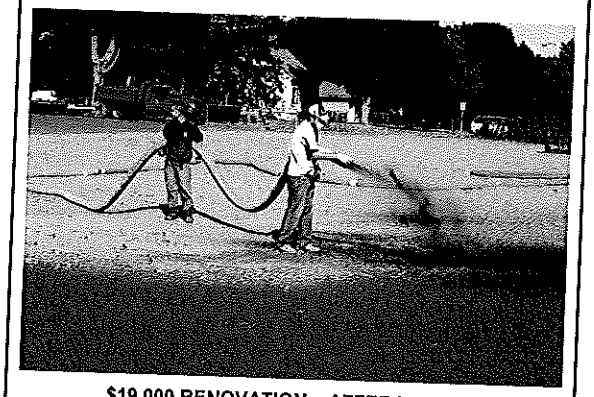
GRUB CONTROL COSTS

Product	Cost/Acre
Dylox	$117.61
Merit	$140.70
Nemasys G	$280 ($624 actual)
Milky Spore Concentrate	$296.21
Milky Spore Spreader	$629.88

Acelepryn $155

MECHANICAL MEANS TO RENOVATE ATHLETIC FIELD

NAUBUC SOCCER RENOVATION – AFTER THE BAN



$19,000 RENOVATION – AFTER THE BAN!

24-0-11 50%SCU	$86.88
24-10-10 50% SCU	$126.44
Milorganite 6-2-0	$188.46
Green Spec 10-2-4	$256.65
Nature Safe 10-2-10	$326.35
Sustane	$426.30
Corn gluten	$364.04
Earth Star All Natural	$555
TOM Compost	$275.73

Final Cost Per Acre For One Year

Total Cost IPM	TOTAL COST ORGANIC
$767.84	$2218.75 Does not include trucking, screening compost

INTERNAL
STEROID
CONSUMPTION

or

HERBICIDE
EXPOSURE?

INFECTION