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pesticide use by Texas Turfgrass Growers



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Pesticide Use by Texas Turfgrass Growers

Kent D. Hall and Rodney L. Holloway*

Extension Agricultural Chemicals
Texas Agricultural Extension Service
Texas A&M University
College Station, Texas 77843

*Respectively, Extension Associate - Agricultural Chemicals, and Extension Specialist - Agricultural Chemicals, Texas Agricultural Extension Service, The Texas A&M University System.

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Pesticide Use by Texas Turfgrass Growers

Kent D. Hall and Rodney L. Holloway

Commercial turfgrass production is a relatively new agricultural enterprise in Texas. Some 200 commercial turfgrass growers in Texas have an estimated 30,000 acres currently in production.*

Individual growers have developed much of the production technology themselves through practical experience and initiative. Commercial production is a highly mechanized and competitive industry. Research data shows production costs at approximately \$2,000 per acre excluding land costs.

Market demand limits production to warm season grasses, such as St. augustinegrass, bermudagrass, zoysia and centipede. Buffalograss and improved bermudagrasses such as Texturf-10, Tifgreen, Tifway, and Tifdwarf are in limited demand. St. augustinegrass accounts for about 70 percent of total Texas production.

A questionnaire sent to members of the Texas Turfgrass Growers Association provided information on Texas turfgrass production pest problems, as well as on pesticide use and benefits.

Methods

Eight members of the Texas Turfgrass Growers Association returned completed questionnaires in response to a request for information on pests, pesticide use and benefits (Table 1). This was a 20 percent response from the 40 Association members who were active in turfgrass production in 1992. With an estimated 200 turfgrass growers in Texas, these eight growers who responded to the questionnaire account for about 4 percent of all Texas turfgrass growers.

A week after mailing the questionnaires to growers, postcards were sent as reminders. A month after the first mailing, a second copy of the survey was sent to those who had not responded.

Grower's responses were entered into a computer spreadsheet. Data in the spreadsheet was compiled and used to produce tables to summarize the responses.

Results and Discussion

Survey responses were received from growers in three of the 14 Extension districts in Texas (Figure 1). Six were from growers in the Upper Coast district, one was from the North Central district, and one was from the South Central district. Turfgrass acreage by district for those eight growers was 3,083, 410, and 301 for the Upper Coast, North Central, and South Central districts, respectively.

The responders reported a total of 3,794 acres (approximately 13 percent of total Texas turfgrass production of 30,000 acres) in turfgrass production in 1992 (Table 1). A large majority of the survey acreage (66 percent) was St. augustinegrass with 2,488 acres, followed by bermudas with 889 acres (including: Tif, Texturf-10, Midiron, and Tifgreen 328). Other grass types were zoysia, fescue, centipede, and buffalograss. Average acres per farm were 474 acres. Two growers had a little over 1,000 acres, three had between 300 and 420 acres, and three had a little over 100 acres.

Average yield per acre was 2,795 square yards of turfgrass. The low was 1,000 square yards per acre and the high was 4,400 square yards per acre. Turfgrass selling prices ranged from \$0.40 to \$1.10 per square yard, and the average for all grasses was \$0.86 per square yard. Nearly all, or about 95 percent of all the acreage, was treated with pesticides.

Growers listed crabgrass and fire ants as the major pests in turfgrass production (Table 2). Other major pests listed included white grubs, dallisgrass, bermudagrass, sprangletop, brown patch, and broadleaf weeds. Bermudagrass was listed most often by growers as a pest problem for which adequate control products or methods are impractical or not available (Table 3). Some of the others listed as difficult to

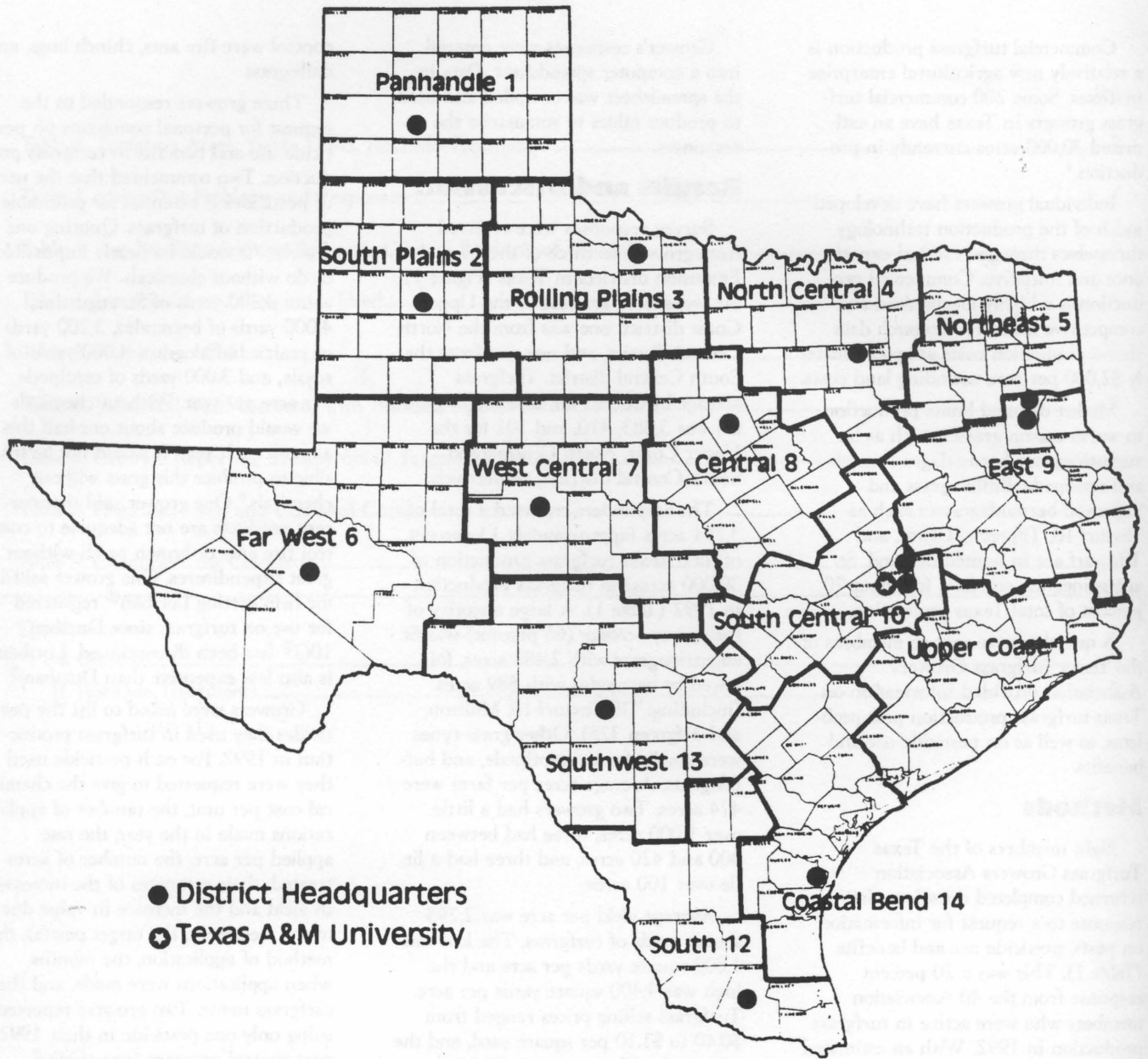
control were fire ants, chinch bugs, and dallisgrass.

Three growers responded to the request for personal comments on pesticide use and benefits to turfgrass production. Two commented that the use of pesticides is essential for profitable production of turfgrass. Quoting one grower; "It would be nearly impossible to do without chemicals. We produce about 3,200 yards of St. augustine, 4,000 yards of bermudas, 3,200 yards of prairie buffalograss, 4,000 yards of zoysia, and 3,000 yards of centipede per acre per year. Without chemicals we would produce about one-half this amount each year. It would not be feasible to produce this grass without chemicals." One grower said that current products are not adequate to control fire ants or brown patch without great expenditures. One grower asked for help getting Lorsban® registered for use on turfgrass since Dursban 10G® has been discontinued. Lorsban is also less expensive than Dursban®.

Growers were asked to list the pesticides they used in turfgrass production in 1992. For each pesticide used they were requested to give the chemical cost per unit, the number of applications made in the year, the rate applied per acre, the number of acres treated, their estimates of the increase in yield and the increase in value due to the treatment, the target pest(s), the method of application, the months when applications were made, and the turfgrass name. Two growers reported using only one pesticide in their 1992 pest control program (one applied Logic® to control fire ants on St. augustinegrass, and one applied atrazine to control crabgrass on St. augustinegrass). One grower reported using as many as 19 different pesticides to control pests on five different grass types. As a whole the growers used 17 different chemicals (active ingredients), nine herbicides, seven insecticides, and one fungicide (Tables 4 and 5). They treated for seven different specified weeds and grasses, six insects, and one fungal disease.

About twice as many acres were treated with at least one application of

*For more information, consult Commercial Turfgrass Production - A Guide for Prospective Growers by Richard L. Duble.



- District Headquarters
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Figure 1. Extension districts as they existed in 1992.

herbicide as were treated with one or more applications of insecticide (herbicides, 3,442 acres; insecticides, 1,814 acres; fungicides, 300 acres). Atrazine was the most common pesticide used (Table 8). Of the 3,374 total acres treated with pesticides, 2,537 acres or 75 percent were treated with atrazine. The next most used chemicals were fenoxycarb (Award® or Logic®), simazine, and hydramethylnon (Amdro®), applied to 1,893 acres (50 percent); 1,208 acres (32 percent); and 1,108 acres (29 percent), respectively.

Growers estimated the benefits of each pesticide treatment in the form of increased yield per acre and increased value per acre due to the treatment. Average estimated yield increase due to applications of Atrazine 90DF® was 1,523 square yards per acre, and average value increase was \$916 per acre (average of three available estimates) (Table 6).

Crabgrass and fire ants were the predominant treated target pests (Tables 4 and 5). Crabgrass was reported as a target pest in 26 of the treatments, and fire ants were the target pest in 24 of the treatments. Atrazine was the chemical used to control crabgrass in 10 treatments. Fenoxycarb and chlorpyrifos (Dursban®) were used to control fire ants in eight and seven of the treatments, respectively. Six growers treated a total of 2,842 acres for crabgrass. Five growers treated 2,056 acres for fire ants (Table 7). Barnyardgrass, broadleaf weeds, and sprangletop were target pests for 2,008, 1,218, and 972 acres, respectively. Atrazine, metolachlor, (Pennant®) and simazine were the chief chemicals used to control barnyardgrass (Table 5). Other weeds treated for were broadleaf, dallisgrass, sprangletop, bermuda, and purple nutsedge. Other insect pests treated were grub worms, armyworms, sod webworms, and chinch bugs (Table 4).

Most treatments were applied between April and October. Ground broadcast spraying was the most common method of application (used in 36 treatments by three growers) followed by centrifugal granular broadcast spreading (used by one grower in 14 treatments). Only one treatment was applied by airplane—the aerial application of fenoxycarb to control fire ants on 134 acres.

Table 1. Turfgrass Acres, Yields, Costs, Pesticide Treatments.

Surveys Sent Out	40
Surveys Returned	8
Percent Response	20
Turfgrass Acres	
St. augustinegrass	2,488
Bermuda turfs	
Texturf-10	165
Tifgreen 328	98
Midiron	20
Tif\1	200
Bermuda (unspecified)	406
Buffalograss	125
Centipede	98
Zoysia	86
Tall Fescue	8
Other	100
Total	3,794
Average Acres per Farm	474
Average Yield per Acre (square yard)	2,795
Average Selling Price per yard	\$0.86
Average Estimated Harvest Cost per yard	\$0.11
Total Acres Treated with Pesticides	3,589
Total Acres NOT Treated with Pesticides	205
Percent of Acres Treated with Pesticides	95
¹ Although Tif is not the full name of any turfgrass, this is all that was supplied by the grower.	

The average cost per acre of Atrazine 90DF used was \$8.37 for the year; and the total cost of Atrazine 90DF® used on 2,427 acres was \$20,319 for the year (63 percent of surveyed growers) (Table 8).

Four growers provided sufficient information to calculate total gross income and the total amount spent on pesticides (excluding the cost of applying the pesticides). The four growers produced a total of 7,559,760 square yards of turfgrass on 3,029 acres for a total gross income of \$6,871,148 (Table 9). They spent a total of \$106,551 on pesticides which was 1.55 percent of the gross income.

Summary

Eight Texas turfgrass growers responding to a survey on pesticide use reported a total of 3,794 acres in turfgrass production in 1992. This accounts for about 12.5 percent of the

estimated 30,000 total acres in turfgrass production in Texas. Ninety-four percent of all the survey acreage was treated with pesticides. As a whole the growers used 17 different chemicals (active ingredients): nine herbicides, seven insecticides, and one fungicide. They treated for seven different specified weeds and grasses, six insects, and one disease or fungus. The predominant target pests treated for were crabgrass and fire ants. Atrazine was the main herbicide used and fenoxycarb the main insecticide used (2,537 acres were treated with atrazine and 1,893 acres were treated with fenoxycarb). The average percent of gross income spent on pesticides by four of the growers was 1.55 percent. Growers commented that pesticide use is essential for profitable production of turfgrass.

Table 2. Major Pest Problems and Responses.

Pest	Extension Districts			Total
	Upper Coast	North Central	South Central	
----- Number of Responses -----				
Crabgrass	4		1	5
Fire Ants	3	1	1	5
Mexican Sprangletop	1		1	2
Brown Patch	1		1	2
Broadleaf Weeds	2			2
Bermudagrass	2			2
Grub Worms	1	1		2
Dallisgrass	2			2
Purple Nutsedge	1			1
Leaf Spot	1			1
Armyworms	1			1
Sod Webworms	1			1
Chinch Bugs	1			1
Barnyardgrass	1			1

Table 3. Pest Problems without Adequate Control Production or Methods.

Pest	Responses
Bermudagrass	3
Fire Ants	2
Chinch Bugs	2
Dallisgrass	2
Brown Patch	1
Mexican Sprangletop	1
Nutsedge	1

Table 4. Insecticides and Fungicides Used.

Trade Name	Common Name	Number of Responses by Pest						Totals
		Fire Ants	Army-Worms	Sod Webworms	Chinch Bugs	Grub Worms	Leaf Spot	
Surban	Chlorpyrifos	7			1	5		13
ward or Logic	Fenoxycarb	8						8
mdro	Hydramethylnon	5						5
orthene	Acephate	4						4
evin	Carbaryl		1	1				2
aconil	Chlorothalonil						1	1
riumph	Phosphorothioate					1		1
yxox	Dimethyl					1		1
otals		24	1	1	1	7	1	35

Note: Nemacur (common name fenamiphos), a nematocide, was used by one grower but no targeted pest was given.

Table 5. Herbicides Used and Number of Grower Responses and Targeted Pest.

Trade Name	Common Name	Crabgrass	Broadleaf Weeds	Barnyard-grass	Dallis-grass	Sprangletop	Bermuda	Nutsedge	Weeds	Winter Weeds	Noxious Weeds	Totals
Atrazine	Atrazine	10	5	6	1	1						23
Pennant	Metolachlor	5	3	5		3			1			17
Simazine	Simazine	5	3	5						2		15
MSMA	Methanearsonate	3		2								5
Banvel	Dicamba		4									4
Poast	Sethoxydim	2		1	1							4
Roundup	Glyphosate				1		1				1	3
Surflan	Oryzalin	1			1							2
Image	Imazaquine							1				1
Totals		26	15	19	4	4	1	1	1	2	1	74

Note: Balan, common name benefin, and Basagran, common name bentazone, were used by one grower but no targeted pests were given.

Table 6. Value and Yield Increases with Pesticide Applications.

	Value Increase		Yield Increase	
	Number of Estimates	Average dollars/acre	Number of Estimates	Average yard/acre
Atrazine 90DF	3	916	3	1,523
Dursban 4E	2	625	2	870
Atrazine 4L	1	25	0	
Dylox	1	500	1	500
MSMA	1	35	1	2,500
Pennant	1	500	1	1,000
Poast	1	200	1	300
Simazine 4L	1	25	0	
Surflan	1	700	1	1,500

Table 7. Growers Reporting Treatment of Targeted Pests.

Pest	Number of Growers	Acres Treated
Crabgrass	6	2,842
Fire Ants	5	2,056
Barnyardgrass	2	2,008
Broadleaf Weeds	2	1,218
Sprangletop	3	972
Dallisgrass	2	405
Bermudagrass	1	300
Leaf Spot	1	300
Noxious Weeds	1	300
Chinch Bugs	1	200
Winter Weeds	1	176
Grub Worms	2	171
Armyworms	1	60
Sod Webworms	1	60
Postemerge Weeds	1	46
Purple Nutsedge	1	20

Table 8. Pesticides Used and Chemical Costs.

Pesticide	Percent of Growers	Total Acres Treated	Chemical Cost per Acre	Total Chemical Cost
			Dollars	
Atrazine 90DF	62.5	2,427	8.37	20,319.00
Pennant	50.0	497	24.59	12,220.00
Orthene	37.5	35	17.00	595.00
Logic	37.5	1,409	8.05	11,347.00
Poast	25.0	45	18.49	832.00
Surflan	25.0	5	27.40	137.00
MSMA	25.0	306	8.96	2,743.00
Simazine 90DF	12.5	1,108	4.73	5,237.00
Triumph	12.5	12	35.00	420.00
Roundup	12.5	300	30.00	9,000.00
Simazine 4L	12.5	100	7.10	710.00
Image	12.5	20	0.55	11.00
Banvel	12.5	46	4.26	196.00
Carbaryl 90DF	12.5	60	5.00	300.00
Award	12.5	350	11.60	4,060.00
Amdro	12.5	1,108	5.00	5,540.00
Atrazine 4L	12.5	200	8.48	1,695.00
Dursban 50W	12.5	4	403.00	1,612.00
Dylox	12.5	30	94.17	2,825.00
Dursban 4E	12.5	200	80.00	16,000.00
Daconil	12.5	300	44.00	13,200.00
Dursban 10%	12.5	39	132.00	5,148.00

Table 9. Chemical Cost Calculations.

Grower Number	Total Acres	Yield yard/acre	Price per yard	Gross Income	Total Chemical Cost	Chemical Cost, Percent of Gross Income
1	105	2,500			\$711	
2	301	3,960	\$1.10	\$1,311,156	\$13,608	1.04
3	110	3,300	\$0.84	\$304,920		
4	419	1,000	\$1.00	\$419,000	\$4,190	1.00
5	1,200	2,000	\$0.90	\$2,160,000	\$28,000	1.30
6	1,109	3,200	\$0.84	\$2,980,992	\$60,753	2.04
7	140	2,000	\$0.40	\$112,000		

Survey of Texas Turfgrass Producers (Pesticide Use and Benefits)

Please provide the following information. Where there is doubt, your best guess will be much better than ours.

I. General

1. County where farm is located _____

2. Total turfgrass acres by variety

Variety

Acres

3. Average yield per acre _____

4. Selling price in dollars per square yard _____

5. Estimated harvest cost per square yard _____

6. Total acres of turf treated with pesticides _____

7. Total acres of turf NOT TREATED with pesticides _____

8. Major pest problems

9. Pest problems for which adequate control products or methods are impractical or not available

10. Personal comments on pesticide use and benefits for turf production (optional).

II. Pesticide Treatments

List all pesticides used in 1992.

Treatments

EXAMPLE

Pesticide Used	Atrazine 4L				
Active Ingredient	Atrazine				
Chem. Cost/Unit	\$10.50/gal				
Cost/Apl./Acre	\$2.50				
App. Method	ground broadcast spray				
Month(s) Appl.	Feb				
No. of Appls.	2				
Rate/Acre	1.5 qt				
Acres Treated	125				
Turf Name	St. Augustine				
Target Pests	Crabgrass				
Estimated Yield Benefits¹	100 sq yd/acre				
Yield Increase					
Value Increase	\$25/acre				

¹Estimated Benefits due to the treatment. Please give your best guess.

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