

IRRIGATOR ADVISORY COUNCIL (IAC)
Adopted MEETING MINUTES
February 16, 2012
12100 Park 35 Circle, Building B, Room 201A
9:30 a.m. to 2:30 p.m.

1. [Mr. Bell] Call to order

Chairman Bell called the meeting to order at 9:40 a.m.

Attendees:

Council Members: David Bell, Karen Guz, Emilio Escobar (via telephone), Toni Fox, Mark Froehlich, Deville Hubbard, David Kania, Nora Mullarkey, Rusty Tucker

TCEQ Staff: Richard Allen, Michael De La Cruz, Russ Gardner, Candy Garrett, Joseph Hildenbrand, Melissa Keller, Linda Saladino, Amy Settemeyer, Salal Tahiri

Visitors: Marsha Carson, Amanda Griffin, Jeffrey Knight, Jerry Lewis, Deborah Phillips, Austin Smith, Larry Spain, Charles Swanson

2. [Mr. Bell] Consider approval of minutes from the November 17, 2011 meeting.

Ms. Garrett stated that there was not an Electrical Board as noted in the draft minutes, so this sentence was removed from the draft being considered.

Ms. Guz stated that there should be a clarification of item 6c in the draft minutes. Clarifications were made to the minutes under item 6c. The wording now reflects, if a master gardener, a landscaper, the staff of a utility company, or the staff of a property management company helps the homeowner or property manager by programming the controller for them, is this a violation of TCEQ rules. Mr. Froehlich moved and Mr. Tucker seconded a motion that the minutes be approved with the changes noted above. The motion passed.

3. [Mr. Bell] Recognition of Mr. John A. Heidman - Landscape Irrigator License #2

Mr. Lewis and Ms. Griffin spoke on the contributions that Mr. Heidman made to the landscape industry. Ms. Mullarkey made a motion to have Mr. Heidman's license be changed to honorary. The motion was seconded by Ms. Guz. The motion passed.

4. [Mr. Tucker] Enforcement and Legislative Committees Reports and Updates

Mr. Tucker wanted to know if a letter needed to be sent to the Justice of the Peace Association concerning enforcement against unlicensed irrigators. After

discussion, it was determined that Ms. Garrett and Mr. Bell would draft a letter to be sent to the Justice of the Peace Association.

Mr. Tucker also wanted to know where violators of the Landscape Irrigation Program were taking their Continuing Education Credit (CEU) hours. Ms. Keller stated that she had just started to track this information, but did not have a representative sample. Ms. Keller stated a representative sample would be provided at the next IAC meeting.

Office of Compliance and Enforcement

a. Outreach

There was no discussion on this item

b. Enforcement Activities

i. Tarrant County Blitz

Ms. Keller discussed the Tarrant County Blitz. Violations discovered included advertising without a license, improper irrigation head placement in parkways, backflow prevention devices under water, irrigation heads too close to hardscape and irrigation plans that did not reflect what was actually installed.

Ms. Keller stated that for Fiscal Year 2012, that Travis County had an influx of complaints.

There was a discussion concerning how cities over 20,000 could be penalized for not enforcing ordinances.

Mr. Bell stated that he wanted the IAC to be more of a resource to TCEQ concerning water conservation and that the landscape irrigation rules are followed.

ii. Enforcement Initiation Criteria

There was no discussion on this item.

5. [Mr. Hubbard] Education, Training and Licensing Committee Reports and Updates

Office of Permitting and Registration

a. Licensing, Training, Testing, and Renewals

There were no comments or discussion.

b. Discussion of CEU credits for smart controller installation and troubleshooting.

Mr. Hildenbrand spoke on a discussion that was held between TCEQ and the Texas Turf Irrigation Association (TTIA). Mr. Hildenbrand discussed what was submitted and what was approved by TCEQ concerning CEU

credits for manufacturer specific smart controllers and troubleshooting. Mr. Hildenbrand stated that the training cannot be a promotion by a manufacturer or a vendor. There was a discussion about what manufacturers could present in a training course. Ms. Griffin stated that manufacturers would present the training on new products, students would get CEU credits and TTIA would be the moderator of the training.

c. Updating of TCEQ website for courses and training providers.

There was a discussion among the IAC concerning when an irrigator receives an NOV or NOE, what types of courses are they taking to renew their license.

d. Discussion of statistics for Irrigation Technicians taking the examination in Spanish.

Mr. Hubbard recommended rescinding the Spanish language exam and was concerned that TCEQ may be doing a disservice to the industry. Mr. Hildenbrand stated that the Regional Offices had been contacted to give the English/Spanish examination when requested. The Regional Offices were giving the English/Spanish examination to both English and Spanish speakers. Mr. Hildenbrand stated that because of this, it created errors in the examination results. Mr. Hildenbrand stated that TCEQ will keep the Licensed Technician examination in Spanish. Later, the examination will be revised, and at that time, it will be determined if the examination will be printed in Spanish.

e. Discussion of modifications concerning license renewal and expiration.
There were no comments or discussion.

f. Discussion of CEU credits for water conservation.

Mr. Hubbard stated that a water conservation document listing topics for water conservation would be submitted to TCEQ. Ms. Mullarkey stated that training should be hands-on training and not on-line training. There was a discussion among the IAC that this would require a rule change. Mr. Gardner stated that rulemaking would occur after the next legislative session. Ms. Garrett explained the rule process.

Ms. Saladino suggested that it would be helpful to get IAC input on the following items:

- Can a licensed irrigation technician take the basic irrigator course in lieu of the technician's course?
- Can a licensed irrigator attending a basic irrigator course receive eight hours CEU's?
- Guidance to basic training providers regarding their courses.

- Applying course codes for specific courses in the design and hydraulics portion of the basic irrigator course.

The IAC will discuss these issues and follow up with Ms. Saladino.

Lunch (1 hour) Mr. Bell adjourned the meeting at 12:00p.m./called the meeting to order 1:00p.m.

6. [Mr. Bell] Hear from individuals wishing to address the Council

a. Mr. Larry Spain-Use of Appropriate Backflow Prevention Devices

Mr. Spain presented a presentation on the Toro's Treflan Line (DL) 2000 drip tubing with root guard. Mr. Spain stated that the drip tubing is a low hazard product and does not induce chemicals into the water supply. Mr. Spain stated that Regulatory Guidance Documents 466 and 470 have different language and do not have a definition for hazard. He would like Texas Administrative Code §344.51(c) to include that a small amount of the chemical to be acceptable. In his presentation, Mr. Spain provided a report supporting that Treflan is a low hazard product. Ms. Keller recommended that the IAC review the report and consider if a rule interpretation of §344.51(c) is needed.

There was a discussion concerning the hazards associated with the product Treflan. Ms. Garrett recommended that Mr. Spain send a letter to the TCEQ concerning his request. Ms. Saladino recommended that Mr. Spain present the information to the Backflow and Cross Connection subcommittee and to the Public Drinking Water section.

b. Others

No others wish to address the Council.

7. [Ms. Guz] Rules and Administrative Committee Reports and Updates

a. Discussion of the legality of irrigation system owners allowing master gardeners to program their irrigation controllers.

There was a discussion among the IAC concerning the legality of irrigation system owners allowing master gardeners to program their irrigation controllers. Ms. Garrett stated that she would check with the TCEQ legal department concerning this issue and provide a legal interpretation. The IAC will discuss this issue at the June IAC meeting.

b. Future rule changes.

Ms. Guz discussed the following issues concerning rule changes:

- Individuals being allowed to take the same course during the renewal period.

- The definition of water conservation.
- The minimum number of CEU's to be taken for water conservation.
- Defining the education level of an individual before taking the irrigator examination.
- A license being required for irrigation scheduling.
- Master valve and backflow prevention device.
- CEU requirements being related to a Notice of Violation.
- The state enforcing against cities that are not enforcing their local ordinances.
- Licensed irrigators missing their renewal date being penalized.

The IAC will send a survey to TTIA members concerning the rule changes.

Ms. Keller stated that most of these rule changes were under the TCEQ licensing section. Ms. Keller stated that a field citation is not a rule change, but is an internal TCEQ policy and discussed the field citation process.

8. [Mr. Bell] Receive, Discuss and Act on Other Items of Interest to IAC

a. Nominations for appointment to serve on the Irrigator Advisory Council

Ms. Keller stated that she knew of two interested individuals who would like to serve on the IAC. There was a discussion of the IAC nominations process. It was encouraged that the IAC members submit nominations to the TCEQ.

b. Future IAC Meetings

The next IAC meeting will be June 21, 2012 in Building A 202

9. Adjournment

The meeting adjourned at 2:30 p.m.

Attachment A-Enforcement Activities

Attachment B-Upcoming Meetings

Attachment C-Licensing, Training, Testing, and Renewals

Attachment D-Larry Spain presentation

ENFORCEMENT ACTIVITIES
Landscape Irrigation Program
September 1, 2011 – February 13, 2012

Notices of Violation – 25

Unlicensed Individuals – 14

- Advertising-14

Licensed Individuals – 11

- LI # not in advertisement – 3
- Incorrect placement of irrigation heads-7
- Plan violations-1

Notice of Enforcement – 11

Unlicensed Individuals – 5

- Installing – 3
- Continuing to advertise without a license – 2

Licensed Individuals – 6

- No permit – 4
- irrigation system inspected not passing final inspection-2

Investigations Conducted – 28 (0 on-site)

Incidents Closed – 20 (20 Unsubstantiated)

Administrative Orders Issued and Penalties Collected-12; \$8,817.00

Note: One NOV or NOE may include several violations

Attachment A



[A to Z Index](#) | [Org Chart](#)

- [Home](#) |
- [AIR](#) |
- [LAND](#) |
- [WATER](#) |
- [Public](#) |
- [Businesses](#) |
- [Governments](#)

>> Questions or Comments:
licenses@tceq.texas.gov

Landscape Irrigation: Upcoming Meetings

Meetings for parties interested in landscape irrigation, including governments and the Irrigator Advisory Council. States whether open to public.

Please check this site periodically for additional meetings and information.

Date	Location	Organization
January 19, 2012	Grapevine Convention Center 1209 South Main Street Grapevine, Texas 76051	Lonestar Irrigation Expo
January 30 - February 2, 2012	Hilton Houston Hobby Airport 8181 Airport Boulevard Houston, Texas 77061	12th Annual Houston Building Professional Institute (HBPPI)
February 16, 2012	Texas Commission on Environmental Quality (TCEQ) 12100 Park 35 Circle Building B, Room 201A Austin, Texas 78753	Irrigator Advisory Council
February 17, 2012	Plano Convention Centre 2000 East Spring Creek Parkway Plano, Texas 75074	Dallas Irrigation Association Expo (DIA)
February 23, 2012	Texas Disposal Systems - Exotic Game Ranch 11508 Carl Road Buda, Texas 78610	2012 Water Rise Irrigation Professional Seminar (WWIP)
March 1-2, 2012	DoubleTree Hotel 6505 Interstate Hwy 35N Austin, Texas 78752	Texas Municipal League
May 1-2, 2012	Austin Convention Center 201 East 2nd Street Austin, Texas 78701	TCEQ Trade Fair
June 10-14, 2012	MCM Eleganté Suites Hotel 4250 Ridgemont Drive Abilene, Texas 79606	Texas State Association of Plumbing Inspectors, INC (TSAPI)
August 17-19, 2012	George R. Brown Convention Center 1001 Avenida De Las Americas Houston, Texas 77010	Texas Nursery and Landscape Association (TNLA)

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Attachment B

1. Licensing, Training, Testing, and Renewals (20 minutes)

09/01/2011-01/31/2012

License Type/Level	New Applications Received	Renewal Applications Received	Total Applications Received	Tests Administered	Tests Passed	Percent Passed	New Licenses Issued	Renewal Licenses Issued	Total Current License
IRRIGATION TECHNICIAN (SPANISH)	86	0	86	143	40	28.0%	41	0	1,27
LANDSCAPE INSTALLER	0	0	0	0	0	0.0%	0	0	
LANDSCAPE IRRIGATION INSPECTOR	6	11	17	10	5	50.0%	6	10	3
LANDSCAPE IRRIGATION TECHNICIAN	112	0	112	116	65	56.0%	77	0	33
LANDSCAPE IRRIGATOR	294	1,165	1,459	471	351	74.5%	223	1,109	5,44
Grand Totals:	498	1176	1,674	740	461	62.3%	347	1119	709

2. Central Office Policy on Exam Day Walk-Ins

Effective January 1, 2012, the TCEQ Central Office located at 12100 Park 35 Circle in Austin, Texas, will no longer accept walk-in applicants on the day of the exam.

In August, 2011, TCEQ Central Office implemented an online exam registration process for all applicants to pre-register for the exam sessions held at the Austin location. This was done to facilitate registration on exam day and to minimize the number of applicants turned away at each session due to over-crowding in the examination rooms.

The Central Office offers exams on the second Monday of each month. There is a morning session at 8:30am and an afternoon session at 1:30pm. Along with those sessions, there is an 8:30am session for those applicants pre-approved to sit for the Water and Wastewater 'A' exams.

Currently, walk-in applicants are allowed, on a first come-first served basis, as room allows. Since the implementation of the online registrations, however, this has become more difficult to maintain as staff must wait to make sure all pre-registered applicants are seated before walk-in applicants.

We encourage all applicants wishing to take their exam at the Austin Central Office to register online at <http://www.tceq.texas.gov/licensing> under the Exam Schedules and Registration page. If you have any questions regarding this process, contact the Occupational Licensing Section at (512) 239-6133.

3. TCEQ Licensing Listserv

To be added to the email list, send an email to join-tceqlicense@listserv.tceq.texas.gov. Once an email has been received you will get a confirmation email indicating that you have been added to the distribution list.

4. Renewal Notifications by Email

As of February 2012 the Occupational Licensing section is emailing individuals to remind them that their license is about to expire. The email is generated if the licensee holds a license that is going to

expire in 90 days. The licensee's email address must be on file to be able to receive a notification email. Below is a total by month of how many email notifications were sent.

- February – 495
- March – 622
- April - 394

5. Technician Exam Pass Rates

The following email went to all exam administrators on 11/17/11:

Exam Administrators,

In an effort to accurately track the pass rates for both the English and Spanish versions of the Irrigation Technician Exam, we are asking for your assistance to ensure the correct version of the exam is being given to applicants.

If an applicant requests the exam in Spanish, they need to be given Test Set IK99903 or IK99904 (EXAMEN PARA TÉCNICO CERTIFICADO DE IRRIGACIÓN).

If an applicant requests the exam in English, they need to be given Test Set IK90004, IK90005, or IK90006 (LICENSED IRRIGATION TECHNICIAN).

Even though Test Sets IK99903 and IK99904 do have the questions in English as well, they should only be used for those requesting the Spanish exam. Otherwise, we will have applicants' scores that are not reading/answering the Spanish version of the questions, therefore skewing the pass rate percentages.

From looking at the exam inventories you all sent in to us, it appears that all regions have ample copies of both types of the exam (except for R10 who does not have any copies of the Spanish version). If you feel you need more copies, please let me know and we will send them out to you.

We appreciate your assistance.

Attachment C

Presentation and Supporting Documents

**Application of:
Title 30, Part 1, Chapter 344, Subchapter E,
Rule §344.51, Section C**

**“Specific Conditions and Cross-Connection
Control”**

**Toro® DL2000™ Inline Drip Tubing with
Rootguard®**

**TCEQ/IAC
February 16, 2012**

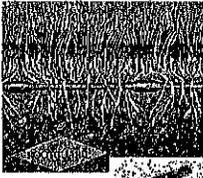
Attachment D

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Toro DL2000® Drip Tubing w/Rootguard®



U.S. Department of Agriculture 2007ECHO4000
Publication
 The Toro DL2000, with its long patented life, is the most durable and reliable emitter outlet. It is made of high quality polyethylene and is designed to last for 10 years or more.

All Crops in Various Climates
 Can be used in cold or hot climates. It is designed to operate in temperatures ranging from 0 to 100 degrees Fahrenheit.

Pressure Compensating Emitter
 Self-Regulating Emitter
 Provides uniform water flow to all emitters. The DL2000 emitter outlet is designed to provide uniform water flow to all emitters.

Essentially Not Water Soluble
 The DL2000 emitter outlet is made of high quality polyethylene and is designed to last for 10 years or more. It is essentially not water soluble.

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TCEQ/IAC Meeting Presentation

Treflan® Released as a Vapor
 Treflan is released in the vapor phase whether or not irrigation is running. It is not carried by the water to its destination.

Treflan – Essentially Not Water Soluble
 Treflan is essentially not water soluble. So if there is any water that remains in 500 feet of DL2000, it will not have any measurable concentration of Treflan.

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TCEQ/IAC Meeting Presentation

No Water in Dripline Tubing
 There is no water retained in the DL2000 dripline because there are no check valves in the emitters and because there are dual opposing emitter outlets to assure that the DL2000 dripline is emptied of water after each irrigation cycle.

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TCEQ/IAC Meeting Presentation

Guideline for Human Consumption

- The interim maximum acceptable concentration (IMAC) for Trifluralin in drinking water is 0.045 mg/L (45 ug/L).

Health Risk Assessment of Trifluralin in Drinking Water, EPA 823-G-93-001, EPA/600/R-93/001

Triflan® Solubility in Water

- 0.0024% at 27°C (80.6 °F)
- Copyright 1998, Triflan, Inc. All rights reserved. See also Section 10

Max. Amount of Triflan in 20.2 Liters of Water in 500' of Tubing (12" spacing)

- 5g emitter x 6% Triflan by weight = 0.3 g Triflan per emitter.
- 40 year discharge expectancy (batch) = 20.5 mg/year = 56 ug/day.
- At known solubility of 0.0024% = 0.0024% x 20.2 Liters = 0.00048 g Triflan in full line.
- Max possible Triflan Concentration = 0.00048 g / 20.2 Liters = 0.0000236 g/L = 0.51% (0.0051 of IMAC level indicated above.)

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TCEQ/IAC Meeting Presentation

- The Triflan® that is fixed in the soil immediately adjacent the emitter outlet cannot be absorbed by the water in the tubing due to the solubility of Triflan.
- The Triflan is molecularly suspended within the polymeric matrix of the emitter. The Triflan is 6% of the weight of the 5 gram emitter; which means the amount of Triflan in the emitter is 0.01 oz.
- Over a 40 year life span, the consistent discharge of Triflan is: .00026 oz per year or 0.0000007 oz/day; or 7 x 10⁻⁷ per day per emitter.
- This should not be considered a "high hazard."

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Backflow Device Selection

Generally, the selection of the proper backflow prevention device is based upon the degree of hazard posed by the cross-connection.



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TCEQ RG-470 Page 40
344.1 Definitions

- (34) Health hazard--A cross-connection or potential cross-connection with an irrigation system that involves any substance that may, if introduced into the potable water supply, cause death or illness, spread disease, or have a high probability of causing such effects.
- (34) Non-health hazard--A cross-connection or potential cross-connection from a landscape irrigation system that involves any substance that generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable if introduced into the potable water supply.

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What is meant by "Degree of Hazard"?

The degree of hazard is a commonly used phrase utilized in cross connection programs and is simply a determination on whether the substance in the non-potable system is:
toxic (health hazard)
non-toxic (non-health hazard).

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What is meant by "Degree of Hazard"?

What is the difference between a toxic and a non-toxic substance?

A toxic substance is any liquid, solid or gas, which when introduced into the water supply creates, or may create a danger to health and well-being of the consumer.

A non-toxic substance is any substance that may create a non-health hazard, is a nuisance or is aesthetically objectionable.

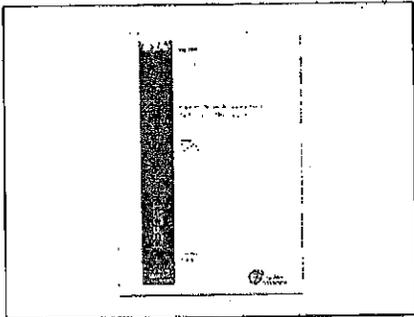
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Backflow Device Selection

RPZ Devices are normally used where a high-hazard (toxic) condition exists.

Double Check Valve Assemblies are normally allowed in a low-hazard (non toxic) situation.

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Rootguard™

66 SUMMARY AND CONCLUSIONS

It is the intent of this document to provide information on the use of Rootguard™ as a backflow prevention device. The information provided is for informational purposes only and does not constitute a recommendation or endorsement of any product or service. The user should consult the manufacturer's literature for complete details on the use of Rootguard™.



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 WASHINGTON, D.C. 20460

NOV 7 1991

Subject: Irrigation Backflow Device of Rootguard
Very Urgent Priority
Your Action Due December 11, 1991

By order of the Administrator, the following information is being provided to you. This information is being provided to you for your information only. It is not intended to be used as a basis for any action by you. The information is being provided to you for your information only. It is not intended to be used as a basis for any action by you. The information is being provided to you for your information only. It is not intended to be used as a basis for any action by you.

[Signature]
 [Title]

Slide 20

ROOTGUARD® Technology

The supplied third-party testing results, white papers, laboratory testing, exemption from registration by the EPA, and conclusions by testing agencies show that the presence of Irtelan® at the level of 0.5% by weight, impregnated into pressure compensating inline emitters that are installed into dripline, does not pose a potential for a high-hazard health risk.

Rootguard (The Battelle Method) has been used for over 25 years with no recorded negative impact to water quality or humans.

We respectfully request that Two D1-2000 dripline with Rootguard® using the EPA Approved Battelle method of delivery be exempted from requirement 344.51c for mandatory use of a reduced pressure principle backflow device when used for irrigation purposes in the State of Texas.



ROOTGUARD® Technology For Sub-Surface Drip Irrigation

ROOTGUARD protection consists of a continuous slow release of Treflan™ from the specially formulated plastic polymer, into the soil whether the irrigation water is running or not. The Treflan is released extremely slowly in the vapor phase and fixes in the soil immediately adjacent to the emitter. This zone of Treflan treated soil creates a vapor back-pressure preventing the further release from the emitter, thereby reducing the amount of Treflan in the soil, restricting the volume of Treflan-treated soil, and increasing the life of the ROOTGUARD protection. Empirical evidence from the field provides Toro with the technical information needed to confidently offer a 7-year, written warranty against root intrusion on its DL2000® Series PC Dripline (5/8" diameter) and DL2000 Series Microline (1/4" diameter) products.

TREFLAN (trade name) is part of the family of chemicals known as dinitroanilines. Trifluralin, which is the generic form of Treflan, is the most widely used of the dinitroanilines. It inhibits the division of cells by inhibiting spindle formation at the end of the root tip in such a way that the root is unable to grow. It is effective - through direct contact and in vapor phase within soils - on the roots of both grasses and broadleaf plants. It is not known to bio-accumulate in plants (i.e., it is not systemic); thus it will not be transported through the food chain to wildlife, domestic animals, or humans.

ROOTGUARD technology is based on the principle of long-term controlled-release by means of a polymeric delivery system. This polymeric delivery system is manufactured by a highly proprietary process. This process combines Treflan with the polymeric base which is then used to mold the pressure compensating emitters. These specially molded emitters are then inserted into the DL2000 tubing during the extrusion process.

The MOLDED emitter itself now becomes a reservoir for the herbicide and a controlled delivery system for the herbicide. This reservoir/delivery system is by its nature, protected from photochemical, chemical, and biological degradation, while providing a method for controlled release. Thus the bioactive chemical is released slowly, in a controlled manner, to the soil adjacent to the device to prevent root intrusion in an environmentally safe way.

 TORO

Count on it.

DL2000® Series PC Dripline

Landscape Drip

Toro® DL2000 Dripline is the most technologically advanced subsurface irrigation system available. Through its non-toxic ROOTGUARD® technology, only DL2000 delivers optimal water application directly to the root zone while safely inhibiting root intrusion. Unlike other subsurface systems, DL2000 requires virtually no maintenance. There are no filters to change or chemically treated disks to handle. Ideal for shrub areas, median strips, public recreation areas and parking islands, DL2000 eliminates overspray and run-off since water is applied only at the root zone.

Features & Benefits

US Government-approved ROOTGUARD Protection

The pre-emergent, TREFLAN®, is impregnated into the emitter during the molding process and creates a "force field" effect around the emitter outlet, diverting root growth and assuring long term reliability.

At Grade Or Buried Options

Can be installed at grade or buried 4" – 8" underground, delivering irrigation directly to the plant's root zone.

Pressure Compensating PC Self-cleaning Emitters

Provide precise, trouble-free water application. TREFLAN® impregnated emitters are inseparably welded to the inside wall of durable polyethylene dripline tubing during manufacturing.

Environmentally Friendly

Irrigation takes place at or below grade so there is minimal water loss due to mist, evaporation, run-off or wind. Fertigation needs are reduced because water is applied only at the root zone. Safety is assured because the treated emitters are inside the DL2000 tubing.

Safety and Liability

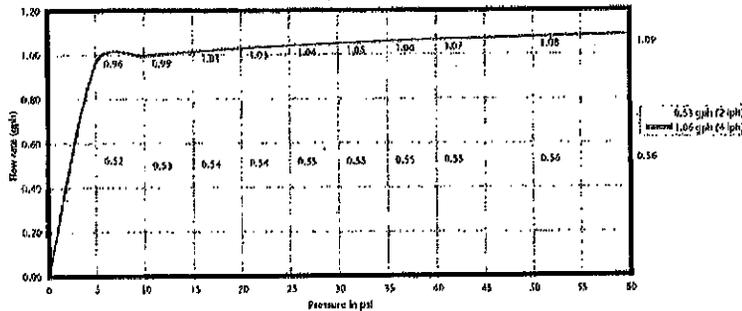
When DL2000 is installed below ground, the landscape surface is free from irrigation equipment that may disrupt activities or cause injury. Sub-surface performance also avoids slippery walkways and roadways as well as wet walls, fences and windows.

 Effluent
Options
Available



DL2000® Series PC Dripline

DL2000 5/8" Emitter Discharge Rate vs. Pressure



Performance Table

Flow Rate	.53/1.06 GPH
Coefficient of Variation (Cv)	≤ 5%
Flow Exponent (x)	0.05
Inside Diameter	0.620"
Outside Diameter	0.710"
Wall	0.045"
Operating pressure (P)	15-60 psi
Minimum filtration requirement	120 Mesh
Hazen-Williams C factor	140
Barb loss factor (Kd)	.98

Specifications

5/8" DL 2000 PC DRIPLINE with ROOTGUARD

Model	Description
• RGP-212-01	0.50 GPH, 12" emitter spacing, 100 ft. coil
• RGP-412-01	1.00 GPH, 12" emitter spacing, 100 ft. coil
• RGP-218-01	0.50 GPH, 18" emitter spacing, 100 ft. coil
• RGP-418-01	1.00 GPH, 18" emitter spacing, 100 ft. coil
• RGP-212-05	0.50 GPH, 12" emitter spacing, 500 ft. coil
• RGP-412-05	1.00 GPH, 12" emitter spacing, 500 ft. coil
• RGP-218-05	0.50 GPH, 18" emitter spacing, 500 ft. coil
• RGP-418-05	1.00 GPH, 18" emitter spacing, 500 ft. coil
• RGP-212-10	0.50 GPH, 12" emitter spacing, 1000 ft. coil
• RGP-412-10	1.00 GPH, 12" emitter spacing, 1000 ft. coil
• RGP-218-10	0.50 GPH, 18" emitter spacing, 1000 ft. coil
• RGP-418-10	1.00 GPH, 18" emitter spacing, 1000 ft. coil

5/8" DL2000 PC PURPLE DRIPLINE with ROOTGUARD

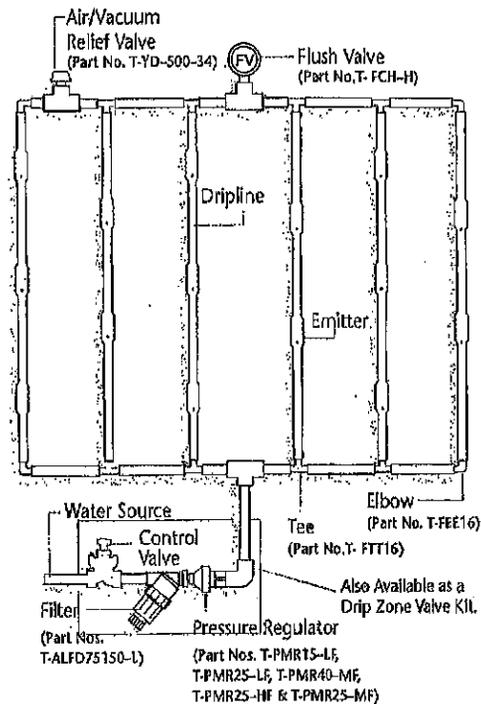
Model	Description
• RGP-212-05-E	0.50 GPH, 12" emitter spacing, 500 ft. coil
• RGP-412-05-E	1.00 GPH, 12" emitter spacing, 500 ft. coil
• RGP-218-05-E	0.50 GPH, 18" emitter spacing, 500 ft. coil
• RGP-418-05-E	1.00 GPH, 18" emitter spacing, 500 ft. coil

Other Features

- Design flexibility for narrow, odd-shaped landscape areas
- Precise watering puts water where it's needed; avoids water marks on expensive hardscapes, glass or signage
- Distinctive red strip on tubing signifies DL2000 w/ROOTGUARD®

Warranty

Seven years



Other fittings available:

- Coupling (Part No. T-FCC16)
- Adapter (Part No. T-FAM16)
- Compression Adapter (Part No. T-CA-710)

5/8" (.0620" ID X 0.710" OD)			Inlet Pressure VS Maximum Length of Run in Feet			
Part No.	Flow Rate (GPH)	Emitter Spacing	15 psi	25 psi	30 psi	40 psi
RGP-212	.53	12"	250'	360'	400'	460'
RGP-218	.53	18"	350'	515'	565'	650'
RGP-412	1.0	12"	160'	240'	260'	300'
RGP-418	1.0	18"	240'	340'	375'	430'

Specifying Information—DL2000

RGP X-XX-XX-E			
Emitter Flow	Emitter Spacing	Coil Length	Optional
X	XX	XX	E
2—.50 GPH	12—12"	01—100'	E—Purple Tubing for Non-potable Water
4—1.0 GPH	18—18"	05—500'	
		10—1000'	

Example: A 500' coil of Pressure-compensating Dripline with ROOTGUARD, 12" emitter spacing and 0.5 GPH (2.0 LPH), would be specified as: RGP-212-05

Note: Specify use Loc-Eze Fittings or .710 Compression Fittings



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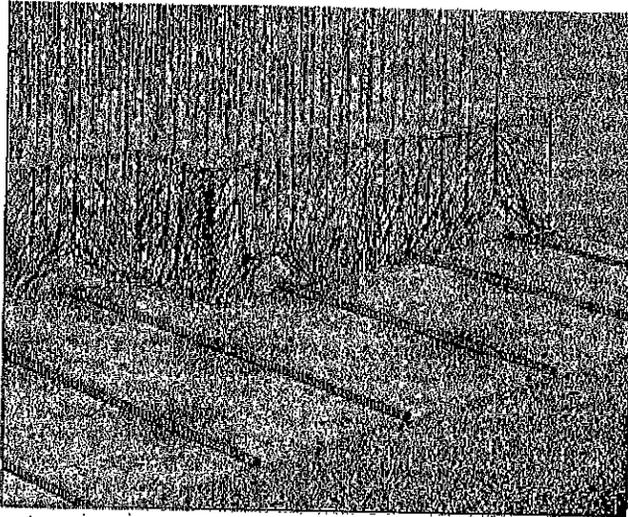
Specifications subject to change without notice. For more information, contact your local Toro distributor. P/N 09-1061-IRC

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GEOFLOW SUBSURFACE DRIP

BIOBARRIER PROTECTION FOR BURIED DRIP IRRIGATION SYSTEMS

Battelle
Pacific Northwest Division



Battelle-Northwest's biobarrier technology excludes plant roots from drip emitters for up to 20 years.

Buried drip irrigation systems offer an efficient and cost-effective way to irrigate crops. They use less water than above-ground systems because they deliver water directly to the plant roots, so excess evaporation and agricultural diseases associated with moist leaves are avoided. Additionally, the drip irrigation systems can bring systemic insecticides to roots in slow, controlled doses.

Unfortunately, roots often clog drip emitters in buried drip irrigation systems, and this tendency severely limits the service life of a valuable irrigation technology.

Now, through a unique marriage of polymer and root-growth inhibitor, researchers at Battelle's Pacific Northwest Laboratories have created long-term, controlled-release devices that establish a barrier zone where plant roots cannot grow. Called "Biobarrier," the devices exclude plant roots for up to 100 years.

The Biobarrier for drip irrigation applications is engineered to exclude plant roots from drip emitters for up to 20 years. Buried drip irrigation systems protected with the Biobarrier offer all the benefits of the buried drip irrigation technology without the problem of root intrusions.

Battelle-Northwest's Biobarrier technology excludes plant roots from drip emitters for up to 20 years.

Combining Chemical and Carrier

The Biobarrier technology combines polymers or other synthetic rubbers with herbicides that inhibit root growth. The technology, originally developed for buried waste sites, releases the herbicide at a uniform rate, maintaining sufficient soil concentration to prevent root growth in the barrier zone. The Biobarrier herbicide was selected for its effectiveness and minimal impact on the environment.

It is harmless to birds, mammals, and insects. It does not kill plant roots but does prevent longitudinal root growth. Also, the herbicide is not significantly water soluble and is not actively translocated into the aerial tissues of the plant. Furthermore, concentrations needed to inhibit root-growth are low, making the biobarrier herbicide an economical and ecologically sound choice.

Battelle-Northwest researchers have identified several polymers and synthetic rubbers as candidate carriers for the Biobarrier herbicide. These materials have proven effective as chemical carriers for controlled-release devices. They act as reservoirs for the chemical and provide a sustained and prescribed chemical release while protecting the herbicide from degradation. Stable and strong, these carriers are also relatively inexpensive to process.

Promising Applications

Battelle-Northwest researchers can tailor the Biobarrier technology to meet many needs. Varying the chemical concentration, polymer thickness, or polymer type creates an engineered obsolescence in the various devices of 2 to 100 years. Integrating the chemical with different polymers or synthetic rubbers, or changing the construction method allows the Biobarrier to assume many shapes and sizes. For example, Battelle-Northwest researchers designed and constructed a sewer gasket that prevents roots from growing through the barrier zone for up to 50 years.

The long-term, controlled-release technology could be used to prevent unwanted plant, animal or insect intrusions in many applications: driveway and highway expansion joints building and house foundations sidewalks, tennis courts, and swimming pools commercial and residential landscaping.

Battelle-Northwest researchers have identified other promising applications for the long-term, controlled-release technology. By incorporating chemicals into controlled-release carriers, researchers may solve problems such as biodegradation of telephone poles, fire ant and termite infestation, rodent and insect attack on buried wires, and tree growth under power lines.

Assistance from Battelle-Northwest

Each application of the Biobarrier concept requires individual study for design and engineering of a long-term, controlled-release device. Companies interested in more information about the Biobarrier technology are invited to contact Battelle-Northwest. The research staff will be pleased to discuss arrangements for feasibility analyses and technical assistance for this or other longterm, controlled-release technology.

For more information, contact:
Peter Van Voris
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Pacific Northwest Division
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May 2008

REPORT ON

Health Risk Assessment for
Trifluralin (Rootguard®)

Submitted to:
Toro Australia
53 Howards Road
BEVERLEY SA 5009

REPORT


A world of
capabilities
delivered locally

Project Number: 087643171 001 R Rev0

Distribution:

1 Copy - Toro Australia (+ 1 electronic)
1 Copy - Golder Associates Pty Ltd



EXECUTIVE SUMMARY

This report presents our review of the available literature for the toxicity of trifluralin and a screening level Health Risk Assessment (HRA) for the Rootguard®, a subsurface irrigation system impregnated with trifluralin to prevent blockage by root growth.

Trifluralin exhibits low acute toxicity via the oral, dermal, inhalation routes. Neat trifluralin causes slight eye irritation, however once diluted with water (as would be the case for the Rootguard®, product) it is not expected to present any irritant characteristics.

Trifluralin can induce skin sensitisation in animal models, and potentially in susceptible people, a characteristic that may still be present when the trifluralin is diluted in the discharge water. However, considering that exposure to the discharge water is likely to be limited to one time exposure at very low trifluralin concentrations, skin sensitisation presents only a minor health hazard.

In rats and dogs, blood toxicity (increased methaemoglobin); changes in urinary parameters and liver toxicity (increased liver weights in the absence of any histopathological changes) are the most sensitive toxicity endpoints after repeated exposure to trifluralin (3-months to 2 years) via the oral route. Liver toxicity was also noted in Wistar rats treated topically (at doses of 200 mg/kg bw/d and above) with trifluralin. Repeated exposure to trifluralin contaminated discharge water released from unearthen damaged subsurface Rootguard® irrigation system is unlikely, therefore chronic toxic effects do not pose an undue health hazard to the public.

The intrinsic toxicological profile of trifluralin suggests that trifluralin is of low acute hazard when impregnated in the polymer matrix of Rootguard® emitter. On this basis, the Rootguard® emitter represents a *Low Hazard* – “any condition, device or practice that, in connection with the water supply system, constitutes a nuisance but does not endanger health or cause injury” as specified by Section 4 of the Australian Standard 3500.1.2003.

The Acceptable Daily Intake (ADI) for trifluralin is 0.02 mg/kg bw/d derived from 3-month rat study using the NOAEL of 2.5 mg/kg bw/d for increased liver weights and adverse urinary parameters and 100-fold safety factor. The Australian Drinking Water Guideline (ADWG) value is 0.05 mg/L and is derived from the ADI.

The trifluralin exposure level in the discharge water associated with the use of Rootguard® emitter is estimated to be less than 0.16 – 0.19 mg/L. Factoring in the type and length of exposure to the discharge water, the daily intake is 0.0005 mg/kg bw/d for an adult, or 0.0015 mg/kg bw/d for a child, significantly less than the ADI.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

MAY 7 2004

Rodney Ruskin
Geoflow, Inc.
506 Tamal Plaza
Corte Madera, CA 94925

Dear Mr. Ruskin:

Subject: Treated Article Exemption Status of RootGuard
Drip Irrigation Products
Your Letter Dated January 14, 2004

We completed our review of the information provided in your most recent letter, referenced above, concerning RootGuard Drip Irrigation Products. It is our opinion that the trifluralin-impregnated drip emitters of RootGuard qualifies for the treated article exemption in Title 40 Code of Federal Regulations (CFR), section 152.25(a). This exemption remains valid as long as that the two conditions specified under the treated article exemption section of the CFR continue to be met. These conditions are; (1) that the article is treated with or contains a pesticide to protect the article itself and (2) the pesticide is registered for such use. The information you have previously provided us indicates that the impregnated emitters are part of the irrigation system which is permanently installed underground (and the emitters are not marketed separately from the irrigation system) and the trifluralin pesticide product used in impregnating the emitters is registered and labeled for this use. If at any time these two conditions are no longer met, then the treated article exemption for the RootGuard drip emitters is invalid. If you have any questions, please contact me at (703) 305-6224 or via email at: miller.joanne@epa.gov.

Sincerely yours,

Joanne I. Miller
Product Manager 23
Herbicide Branch
Registration Division (7505C)

(E) a separate atmospheric vacuum breaker is installed on the discharge side of each irrigation control valve, between the valve and all the emission devices that the valve controls.

(c) Backflow prevention devices used in applications designated as health hazards must be tested upon installation and annually thereafter.

(d) If there are no conditions that present a health hazard double check valve backflow prevention assemblies may be used to prevent backflow if the device is tested upon installation and:

- (1) a local regulatory authority does not prohibit the use of a double check valve;
- (2) backpressure caused by an elevation of pressure in the discharge piping by pump or elevation of piping above the supply pressure which could cause a reversal of the normal flow of water or back-siphonage conditions caused by a reduced or negative pressure in the irrigation system exist; and
- (3) test cocks are used for testing only.

(e) If a double check valve is installed below ground:

- (1) test cocks must be plugged, except when the double check valve is being tested;
- (2) test cock plugs must be threaded, water-tight, and made of non-ferrous material;
- (3) a y-type strainer is installed on the inlet side of the double check valve;
- (4) there must be a clearance between any fill material and the bottom of the double check valve to allow space for testing and repair; and
- (5) there must be space on the side of the double check valve to test and repair the double check valve.

§344.51. Specific Conditions and Cross-Connection Control.

(a) Before any chemical is added to an irrigation system connected to any potable water supply, the irrigation system must be connected through a reduced pressure principle backflow prevention assembly or air gap.

(b) Connection of more than one water source to an irrigation system presents the potential for contamination of the potable water supply if backflow occurs. Therefore, connection of any additional water source to an irrigation system that is connected to the potable water supply can only be done if the irrigation system is connected to the potable water supply through a reduced-pressure principle backflow prevention assembly or an air gap.

(c) Irrigation system components with chemical additives induced by aspiration, injection, or emission system connected to any potable water supply must be connected through a reduced pressure principle backflow device.

(d) If an irrigation system is designed or installed on a property that is served by an on-site sewage facility, as defined in Chapter 285 of this title (relating to On-Site Sewage Facilities), then:

- the distance from the lowest point of the water supply outlet to the flood rim of the assembly into which the outlet discharges is one inch or larger, or is at least twice the diameter of the water supply outlet;
- a chemical is added to the irrigation system; or
- more than one water source is used.

Use a *reduced pressure principle backflow prevention device* if:

- the device is installed at least 12 inches above ground;
- the device will not be submerged;
- drainage is included for any discharge from the relief valve;
- a chemical is added to the irrigation system by aspiration or injection or is embedded in an emission system component; or
- the irrigation system is installed on a property served by an on-site sewage facility (such as a septic tank) and is connected to a supply of potable water.

Use a *pressure vacuum breaker* if:

- there is no back pressure and
- the installation is at least 12 inches above any downstream piping and the highest downstream opening—measuring from the top of the sprinkler, with pop-up sprinklers retracted.

Use an *atmospheric vacuum breaker* if:

- there is no back pressure,
- there are no isolation valves downstream from the device,
- the installation is six inches or more above both the downstream piping and the highest downstream opening,
- there is no continuous pressure on the supply side of the device for more than 12 hours in any 24-hour period, and
- a separate atmospheric vacuum breaker is installed on the discharge side of each control valve.

A *double check valve backflow prevention device* can be used if:

- the local water purveyor does not prohibit it,
- back pressure could reverse the normal flow of water or cause back siphonage from reduced pressure in the system, and
- test cocks are used for testing only.

A double check valve backflow prevention device can be installed *belowground* when:

- test cocks are plugged (except during testing), threaded, watertight, and made of non-ferrous materials;

Specific Conditions and Cross-Connection Control, §344.51, requires a reduced pressure principle backflow prevention assembly or air gap if:

- a chemical is added to an irrigation system that is connected to a potable water supply;
- the irrigation system has more than one water source and is connected to any potable water supply; or
- the irrigation system has components with chemical additives and is connected to a potable water supply.

If an irrigation system is on a property served by an on-site sewage facility, then:

- piping and valves must meet separation distances required for private water lines (see § 285.91(10) for requirements);
- connections to a private or public potable water source must be through a reduced pressure principle backflow prevention assembly; and
- water from the irrigation system that is applied to the surface of the area utilized by the on-site sewage facility must be controlled on separate irrigation zone or zones.

Section 344.52, Installation of Backflow Prevention Device, requires an approved, properly installed backflow prevention method if an irrigation system is connected to a potable water supply and if any maintenance, alteration, repair, or service of the system requires opening to the atmosphere of the main line at any point prior to the discharge side of any zone control valve. If an automatic master valve is used, it should be on the discharge side of a double check valve, pressure vacuum breaker, or reduced pressure principle backflow assembly. Irrigators must ensure the backflow prevention device is tested prior to the irrigation system being placed in service and that test results are provided to the water purveyor and the irrigation system owner within 10 business days of testing the device.

Section 344.60, Water Conservation, requires that irrigation systems be designed, installed, maintained, altered, repaired; serviced, and operated in a manner that promotes water conservation.

Section 344.61, Minimum Standards for the Design of the Irrigation Plan, requires that irrigators prepare an irrigation plan for all irrigation systems. A paper or electronic copy of the plan must be on the job site at all times during the installation of the irrigation system. A drawing showing the actual installation of the irrigation system must be given to the irrigation system owner. Variances may be made from the original plan if the irrigator authorizes changes that do not diminish the operation integrity of the irrigation system, do not violate any state or local requirements, and are noted in red on the irrigation plan. The irrigation plan must include complete coverage of the area or clearly identify areas that are not covered.