



Zylam™ 20SG

SYSTEMIC TURF INSECTICIDE

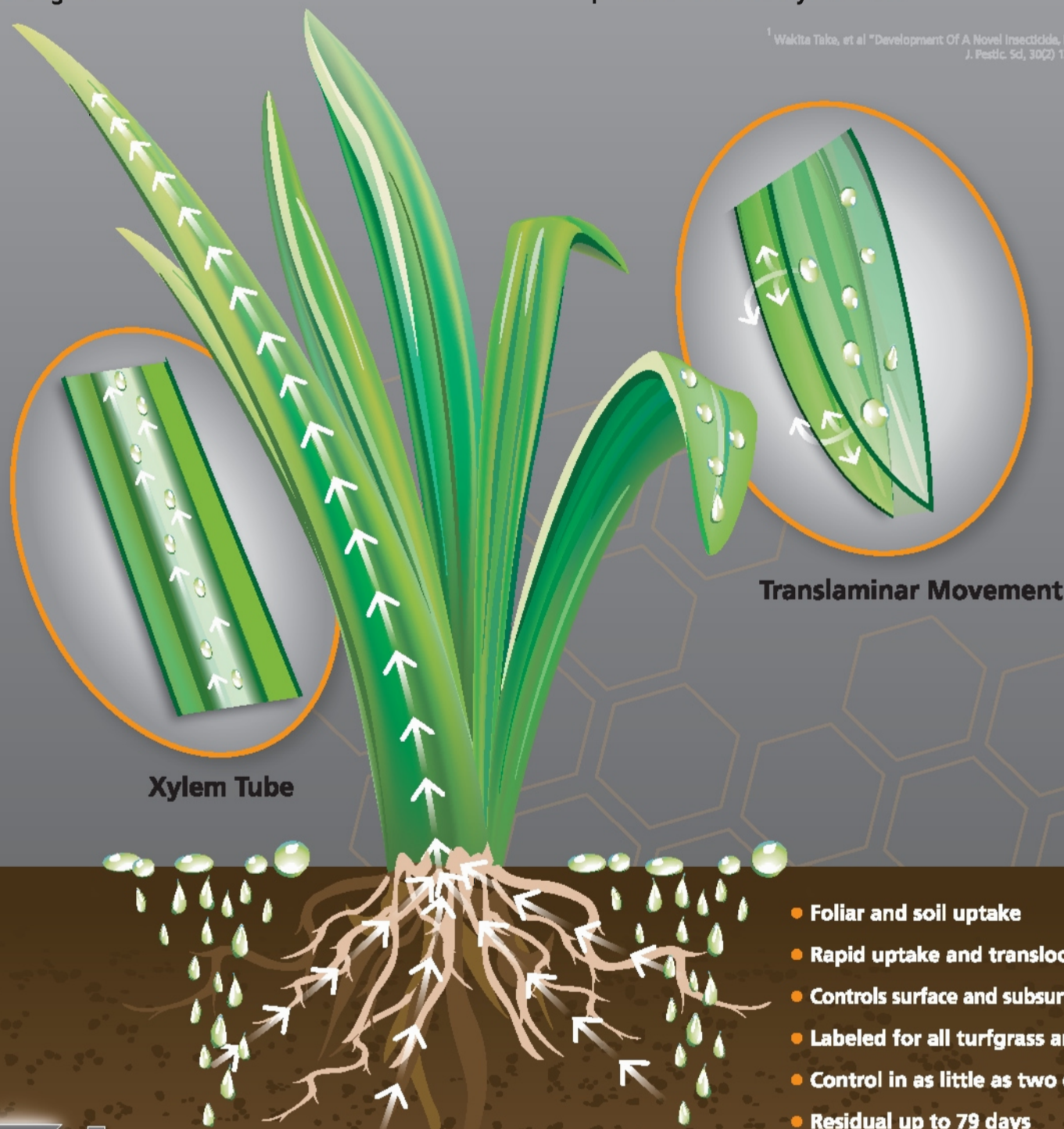
Technical Bulletin

Introduction

Zylam™ 20SG Systemic Turf Insecticide controls many of the toughest insect pests found in turf. It contains the active ingredient dinotefuran; a third generation neonicotinoid insecticide belonging to the chemical Group 4A. **Rapid plant uptake and translocation is a key feature of Zylam 20SG.** Enhanced translaminar movement through leaf tissue and quick root uptake and translocation through the xylem provide fast and efficient protection to turfgrasses.

Once inside the plant, Zylam 20SG targets acetylcholine receptors in the nervous system of attacking insects. Unlike other neonicotinoids, it has been suggested that dinotefuran acts on a different binding site¹, possibly accounting for Zylam's ability to impact resistant chinch bugs and other tough turf insects such as mole crickets, annual bluegrass weevils and crane flies. Zylam 20SG is not a strong grub product but does provide a level of protection from heavy infestations.

¹ Wakita Take, et al "Development Of A Novel Insecticide, Dinotefuran"
J. Pestic. Sci, 30(2) 122-123 (2005)



Xylem Tube

Translaminar Movement

- Foliar and soil uptake
- Rapid uptake and translocation
- Controls surface and subsurface insects
- Labeled for all turfgrass areas
- Control in as little as two days
- Residual up to 79 days
- Convenient 1-acre packaging
- Low-odor

Zylam™ 20SG
SYSTEMIC TURF INSECTICIDE

Treated insects are affected both on contact and through ingestion resulting in the termination of feeding. Also unlike other neonicotinoids, treatment with Zylam 20SG results in death shortly after application – in as little as two days. Highly systemic, Zylam 20SG also provides residual activity. In studies, mole cricket efficacy was observed up to 79 days.

The toxicological profile is very favorable, with low toxicity to mammals, birds and aquatic organisms. Treatment impact on beneficial insect populations is also low, limiting pest resurgence from target and secondary pests.

Zylam 20SG is formulated as a water dispersible granule. These granules are dust-free, mix completely in water and provide an end-use spray solution that is colorless and odorless.

Extensively tested at universities across the United States, Zylam 20SG brings a reliable solution to turf managers battling tough surface and many subsurface feeding turf pests.

MODE OF ACTION

Highly systemic, Zylam moves from the soil to the plant. It translocates quickly within the vascular tissue (xylem) of turfgrass providing rapid insect control. The product is also translaminar, allowing it to be sprayed on the upper surfaces of a turfgrass blade and moving to the underside.

USE SITES

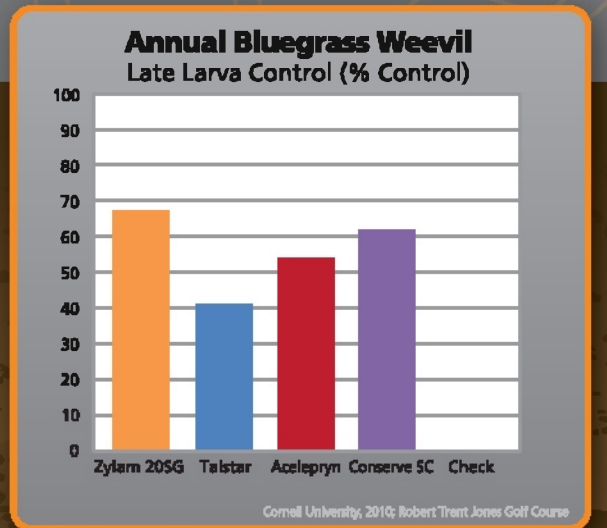
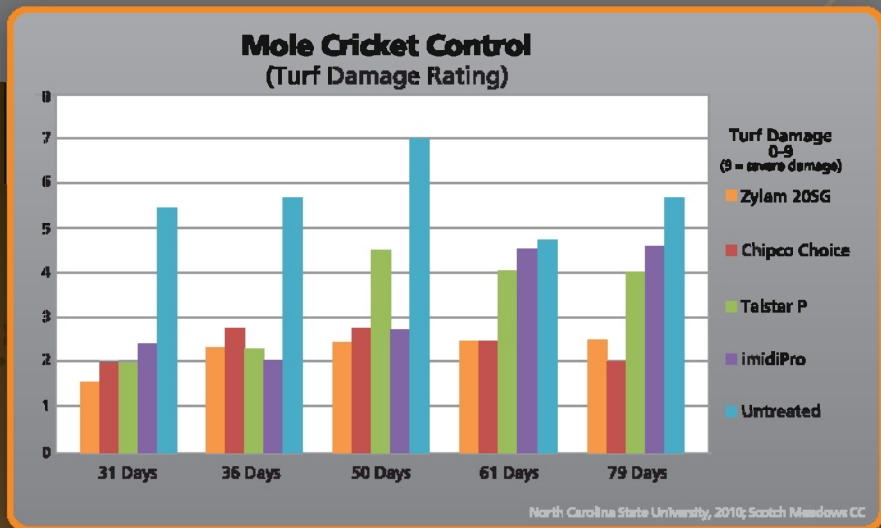
For use on all turfgrass areas including residential, commercial and recreational such as golf courses (including greens), home lawns, apartment and condo complexes, parks, athletic fields, office complexes, hotels and sod farms.

USE SEASON

Zylam can be used curatively whenever insect population has reached a threshold level deemed necessary to control target insects. Use it preventatively for control of target insects before damage occurs. Please contact your state or county extension agent or certified advisor for specific timing.



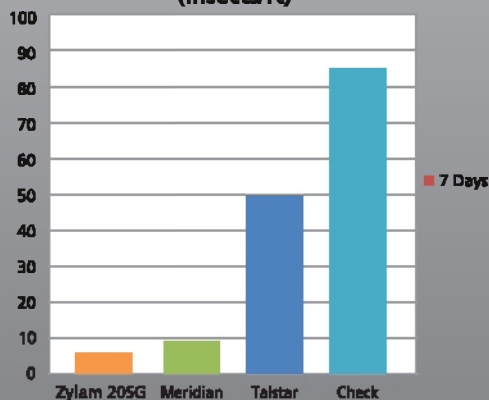
Efficacy Data



Insects Controlled

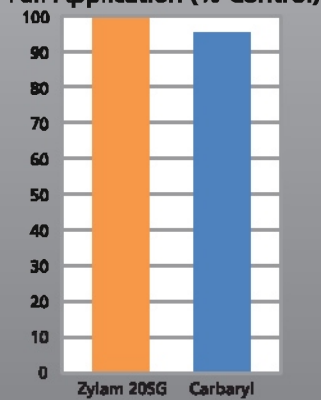
Crop	Pest	Product Rate	Remarks
Turfgrasses Residential Recreational Commercial	Annual Bluegrass Weevil Billbug	2.7 lb. per acre or 1 oz. per 1000 sq. ft.	For optimum control of annual bluegrass weevil and billbugs, make application prior to or during egg hatch of the target pest or apply at first appearance of young larvae.
	Chinch Bug	2.7 lb. per acre or 1 oz. per 1000 sq. ft.	Make application prior to hatching of the first sign of instar nymphs or when turf damage first appears.
	Crane Fly, European	2.7 lb. per acre or 1 oz. per 1000 sq. ft.	Spring applications as a curative control when larvae are mature, but prior to pupation generally March and April. For Fall applications apply soon after egg hatch.
	Cutworms Sod Webworm	2.7 lb. per acre or 1 oz. per 1000 sq. ft.	Apply at first appearance while pests are small.
	Mole Cricket Southern mole cricket Tawny mole cricket	2.7 lb. per acre or 1 oz. per 1000 sq. ft.	Make application prior to or during the peak egg hatch period. When adults or large nymphs are present and actively tunneling, tank mix with a curative insecticide may be necessary.
	Grub Larvae [suppression] such as: Asiatic garden beetle Black Turfgrass ataeenius European chafer Green June beetle Japanese beetle May/June beetle Northern masked chafer Oriental beetle Southern masked chafer	2.7 lb. per acre or 1 oz. per 1000 sq. ft.	For optimum activity on grubs: make application prior to or during egg hatch of the target pest.

Pyrethroid Resistant Chinch Bug
(Insects/ft)



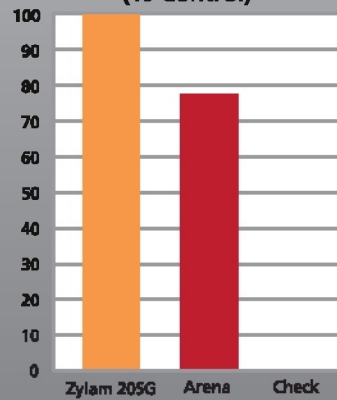
University of Florida, 2010

Crane Fly Larva
Fall Application (% Control)



Cornell University, 2004; Niagara County Golf Course

Cutworm/Sod Webworm
(% Control)



Ohio State University, 2010

Dinotefuran

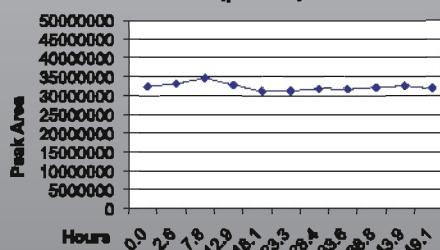
ENVIRONMENTAL FATE/EFFECTS

Dinotefuran is stable in water at a range of pH 4 to 9 and appears to be relatively persistent to metabolism both in aerobic and anaerobic soil conditions (half-life 82-138 days). It is considered to be highly mobile ($K_{oc} = 6 - 45 \text{ mL/g}$) in various soil types.

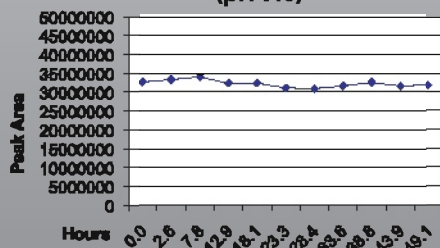
STABILITY

No chemical stability issues when used in a typical spray tank at pH ranges 5.0 - 8.0.

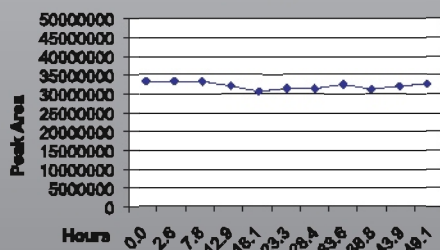
Dinotefuran Spray Tank Stability (pH 5.0)



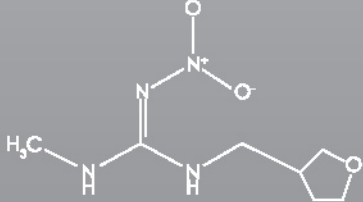
Dinotefuran Spray Tank Stability (pH 7.0)



Dinotefuran Spray Tank Stability (pH 8.0)



PHYSICAL AND CHEMICAL PROPERTIES

Common name:	Dinotefuran
Chemical name:	Dinotefuran (N-methyl-N'-nitro-N''-[(tetrahydro-3-furanyl)methyl]guanidine)
Chemical formula:	
CAS number:	165252-70-0
Molecular weight:	202.21
Melting point/range:	107.5°C
pH:	7.6
Density:	31.2 - 43.7 pounds/cubic foot
Water solubility (20°C):	39,830 ppm
pKa at 20°C:	12.6
Vapor pressure:	1.7x10 ⁻⁶ @ 30°C for Dinotefuran
Soil half life:	82 - 138 days
KOC – organic-carbon sorption constant (ml g ⁻¹):	<46

MAMMALIAN TOXICITY

Hazard Indicator	Dinotefuran Technical
Acute oral LD ₅₀	>2000 mg/kg
Acute dermal LD ₅₀	>2000 mg/kg
Acute inhalation LC ₅₀	>2.943 mg/L
Eye Irritation	Mild Irritant
Skin Irritation	Mild irritant
Skin sensitization	Not sensitizing

ENVIRONMENTAL SAFETY

Hazard Indicator	Dinotefuran Technical
Freshwater fish	LC ₅₀ : >100 ppm/96 hr
Freshwater Invertebrate	EC ₅₀ : 199 ppm/48 hr
Marine Invertebrate	ErC ₅₀ : >100 ppm/0-72 hr



IMPORTANT NOTES:

- Apply in sufficient water to ensure thorough coverage of target area. Use a minimum of 50 gallons finished spray per acre.
- Consult your State or County Extension Service or State Extension Turfgrass Specialists for more specific information on timing of insecticide applications.
- For optimal control, apply irrigation if rainfall does not occur within 24 hours after application to ensure movement of the active ingredient through the thatch.



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