

WEST
PLAINS
IPM
UPDATE

News about
Integrated Pest
Management in
Hockley,
Cochran, and
Lamb Counties
from
Kerry Siders

April 12, 2016

Vol. 21 – No. 2

Cotton Root-knot Nematode

The root-knot nematode (*Meloidogyne incognita*) is widely distributed throughout much of the southern High Plains and is capable of causing significant yield loss. Since 1996 I have soil sampled irrigated cotton IPM Program scouting fields in Hockley and Cochran Counties for root-knot nematodes. Eighty – one percent of all samples have contained a damaging level of root-knot. The remaining 19% are fields which are either routinely rotated with another crop such as peanuts or have employed very effective chemical control measures. Symptoms associated with root-knot damage consist of poor vigor, stunting, yellowing of leaves and wilting. A characteristic feature of root-knot nematodes is the formation of galls that occur on the roots .



In addition, infected plants may exhibit nutrient deficiency-like symptoms, as *M. incognita* females feed on cotton roots and disrupt the plant's ability to acquire water and nutrients. The amount of damage observed is more severe when nematode populations are high. Furthermore, this damage may be enhanced by other stresses such as drought or herbicide injury.

Several cotton varieties with partial resistance to root-knot nematodes are now available. The varieties FiberMax 2011GT and 1911GLT, Stoneville 4946GLB2, Deltapine 1554NR B2RF and 1558NR B2RF, and Phytogen 367WRF and 417WRF have been evaluated and are known to have partial resistance and/or improved tolerance. There are others which are sold as tolerant/resistant varieties.

The variety Phytogen 417WRF greatly reduces nematode reproduction and may be an option for fields that are severely infested.

Sampling at the end of the growing season will provide the most reliable results of knowing what level of infestation is present in a field, as nematode populations are highest at that time of the year. To learn more about sampling go to this document:

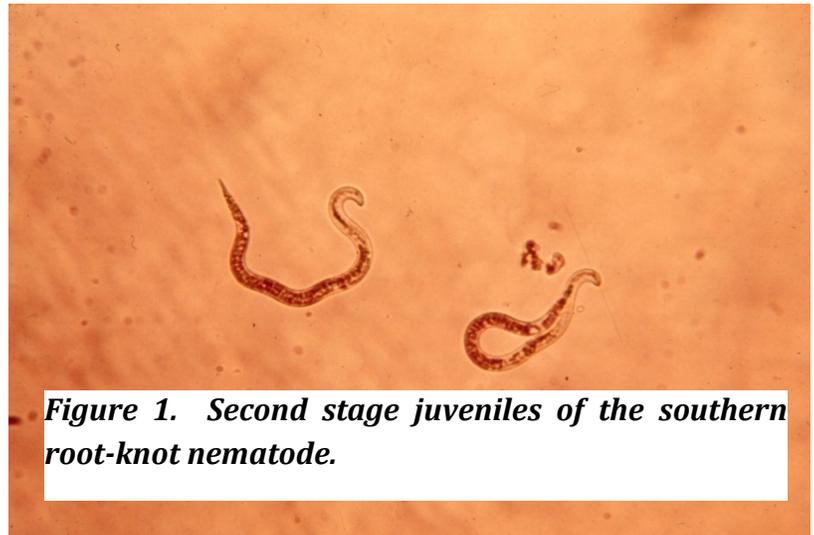


Figure 1. Second stage juveniles of the southern root-knot nematode.

<http://24benefi37g1f8w8w3ohxam1.wpengine.netdna-cdn.com/files/2011/11/Nematodesampling.pdf>.

Crop rotation with a non-host is a good way to reduce nematode densities, but *M. incognita* populations can build up quickly the next year cotton is planted. With the loss of Temik 15G, chemical management options for nematodes are limited. Performance of the seed treatment nematicides, such as Acceleron-N, the Aeris Seed Applied System and Avicta Complete Cotton are somewhat inconsistent and should not be used as stand-alone in high-risk fields. A new product called Velum Total from Bayer has been tested as an in-furrow applied liquid and is available this year for commercial use. Foliar applications of Vydate® are labeled for use in cotton, however, production issues still are causing Vydate to be unavailable for this early portion of the growing season. Research I have conducted here in Hockley and Cochran Counties has shown that Vydate is most effective when applied soon after emergence when 2-3 true leaves are present at a 17 ounce broadcast rate per acre. This would be followed by another 17 ounce application 7 days later. A band application can be made in order to save on chemical cost as long as a uniform application can be made. The soil fumigant Telone II has been used to successfully manage nematodes in the High Plains; however, usage is limited. This is due to availability and cost of the product, as well as constraints that affect application (i.e. specialized equipment and adequate soil moisture at the time of application). Other new products are being tested for efficacy against cotton nematodes, but data is limited at this time.



Figure 2 Root-knot nematode damage on cotton roots.

Private Pesticide Applicators Training

The Texas A&M AgriLife Extension Service will offer the required private Pesticide Applicators Training (PAT) in Levelland on April 28 and again on May 26, 2016 in Littlefield. This training is required by Texas Department of Agriculture before taking the exam for obtaining the license. A private pesticide applicator is a person who uses or supervises the use of a restricted-use or state limited-use pesticide or a regulated herbicide for the purpose of producing an agricultural commodity. This license is not for those receiving monetary compensation for a pesticide application.

To participate in a training individuals must call 806-894-3159 by 3pm the day prior (Wednesday) to the training in Levelland or 806-385-4222 ext 235 by 3pm the day prior (Wednesday) to the training on May 26 in Littlefield. The trainings will begin promptly at 1pm at the Extension Offices (see addresses below). There is a \$60 fee for training materials. This is only the required training. Testing will be conducted at a separate time and location.

Future PAT Trainings:

- June 27 Morton Extension Office 200 W. Taylor Avenue
- July 28 Levelland Extension Office 1212 Houston Street
- August **TBA** Littlefield Extension Office, Courthouse, Room B-5
- September 22 Morton Extension Office 200 W. Taylor Avenue
- October 27 Levelland Extension Office 1212 Houston Street
- November **TBA** Littlefield Extension Office, Courthouse, Room B-5
- and December 19 Morton Extension Office 200 W. Taylor Avenue

Texas A&M AgriLife Extension seeks to provide reasonable accommodations for all persons with disabilities for any educational meetings. Please contact us to advise us of the auxiliary aid or service that you will require a week in advance of a training.

Sugarcane Aphid Update:

Texas was notified yesterday (April 11, 2016) by EPA that the use of sulfoxaflor (Transform by Dow) has been authorized for Section 18 for use against the sugarcane aphid on sorghum. Here are the conditions, modifications and restrictions set out by EPA for Texas:

1. The Texas Department of Agriculture (TOA) is responsible for ensuring that all provisions of this specific exemption are met. TOA is also responsible for providing information in accordance with 40 CFR 166.32(b). Accordingly, a report summarizing the results of this program must be submitted to EPA Headquarters and the EPA Region 6 office within 6 months following the expiration of this exemption or prior to requesting another specific exemption for this use in the following year. In accordance with 40 CFR 166.32(a), these offices shall also be immediately informed of any adverse effects resulting from the use of this pesticide in connection with this exemption.
2. The unregistered product, Transform™ WG (50% a.i. sulfoxaflor), manufactured by Dow AgroSciences, may be applied. All applicable directions, restrictions, and precautions outlined in the Section 18 use directions submitted to the Agency by Dow AgroSciences on December 7, 2015 must be followed except as modified in this authorization document.

3. Foliar applications may be made by ground or air at a rate of 0.75-1.5 oz of product (0.023-0.047 lb a.i.) per acre. A maximum of 2 applications may be made per year, resulting in a seasonal maximum application rate of 3.0 oz of product (0.09 lb a.i.) per acre per year.
4. Retreatments are prohibited within 14 days of application and a restricted entry interval (REI) of 24 hours must be observed for all applications.
5. Pre-harvest interval (PHI): Do not apply within 14 days of grain or straw harvest or within 7 days of grazing, or forage, fodder, or hay harvest.
6. A maximum of 3,000,000 acres of sorghum fields (grain and forage) may be treated in Texas.
7. To prevent exposure to bees that may forage on treated sorghum during bloom, the following pre-bloom restriction must be on the Section 18 label: "Do not apply product 3 days pre-bloom or until after seed set."
8. The following Environmental Hazards Statement must be on the Section 18 label:

"This product is highly toxic to bees exposed through contact during spraying and while spray droplets are still wet. *This* product may be toxic to bees exposed to treated foliage for up to 3 hours following application. Toxicity is reduced when spray droplets are dry. Risks to pollinators from contact with pesticide spray or residues can be minimized when applications are made before 7:00 am or after 7:00 pm local time or when the temperature is below 55 degrees Fahrenheit (°F) at the site of application."
9. To minimize spray drift and potential exposure of bees when foraging on plants adjacent to treated fields:
 - Applications are prohibited above wind speeds of 10 miles per hour (mph).
 - Applications must be made with medium to coarse spray nozzles (i.e., with median droplet size of 341 µm or greater).
10. Applications made in accordance with the above provisions are not expected to result in combined residues of sulfoxaflor, including its metabolites and degradates, in or on sorghum commodities in excess of the following time-limited tolerances: sorghum, forage at 0.40 ppm; sorghum, grain at 0.30 ppm; and sorghum, stover at 0.90 ppm; and the established permanent tolerance for aspirated grain fractions at 20 ppm. The Agency has determined that these levels are adequate to protect the public health. Time-limited tolerances in connection with this action have been established in 40 CFR 180.668(b).
11. This specific exemption expires 1 year from date of issuance, as given above.
12. Following the expiration of this emergency exemption, any unused unregistered product must be either returned to the manufacturer or distributor in unopened containers or disposed of in accordance with the Resource Conservation Recovery Act.
13. This is the third year that TDA has requested an exemption for this use. Due to the introduction of this invasive pest in sorghum, EPA has determined that for next year, this use is eligible for the streamlined review under the re-certification program (40 CFR 166.20(b)(5)).

See You On The Radio

IPM Radio Program Aglife on Fox Talk KJTV, radio 950 AM, on Wednesdays from 1:00 to 2:15 pm.

Texas A&M AgriLife Extension in Hockley County Report on KLVT Levelland, High Plains Radio Network, radio 1230 AM, Wednesdays from 7:30 am to 7:45 am.

West Plains IPM Update is a publication of the Texas A&M AgriLife Extension Service IPM Program in Hockley, Cochran, and Lamb Counties.

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The Texas A&M System, U.S. Department of Agriculture, and the Commissioners Courts of Texas Cooperating

Transform[®] WG

Registration Notes:

Proposed Section 18.

This Section 18 labeling is provided in two components: (1) The base label and label booklet containing all of the information needed to use this product, except crop-specific use directions; and (2) crop-specific use directions which must be approved by EPA which allow use in a specific state. Component (1) allows the product to be shipped to locations where it can be used in anticipation of EPA-approval of crop-specific use directions in component (2).

[®]Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

(Base label):

(logo) Dow Agrosciences

Transform[®] WG

**INSECTICIDE
ISOCLAST ACTIVE**

ATTENTION

- **Section 18 Specific Exemption**
- **For Use Only in States with a Valid Section 18 Label**

This product cannot be used without a valid state-specific Section 18 label which must be in the possession of the user at the time of application.

Active Ingredient:

sulfoxaflor	50%
Other Ingredients	50%
Total	100%

Contains 50% active ingredient on a weight basis.

Keep Out of Reach of Children

DANGER PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

First Aid

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Precautionary Statements

Hazard to Humans and Domestic Animals

Corrosive • Causes Irreversible Eye Damage • Harmful If Swallowed

Do not get in eyes or on clothing.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks

- Protective eyewear

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards

This product is highly toxic to bees exposed through contact during spraying and while spray droplets are still wet. This product may be toxic to bees exposed to treated foliage for up to 3 hours following application. Toxicity is reduced when spray droplets are dry.

Risk to managed bees and native pollinators from contact with pesticide spray or residues can be minimized when applications are made before 7:00 am or after 7:00 pm local time or when the temperature is below 55° F at the site of application.

Refer to the Directions for Use for crop specific restrictions and additional advisory statements to protect pollinators.

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks

Storage and Disposal

Do not contaminate water, food or feed by storage and disposal.

Pesticide Storage: Store in original container only.

Pesticide Disposal: Return any unopened, unused container of this unregistered product to the manufacturer or distributor, or dispose of it in accordance with Resource Conservation and Recovery Act regulations, following the expiration of the emergency exemption.

Container Handling: Nonrefillable container. Do not reuse or refill this container.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Product Information

Carefully read, understand and follow label use rates and restrictions. Apply the amount specified in the mixing directions tables with properly calibrated aerial or ground spray equipment. Prepare only the amount of spray solution required to treat the measured acreage. The low rates may be used for light infestations of the target pests and the higher rates for moderate to heavy infestations. Transform[®] WG insecticide may be applied in either dilute or concentrate sprays so long as the application equipment is calibrated and adjusted to deliver thorough, uniform coverage. Use the specified amount of Transform WG per acre regardless of the spray volume used.

Refer to state-specific Section 18 label for additional precautionary information including Directions for Use. This product cannot be used without a valid state-specific Section 18 label. The Section 18 label must be in the possession of the user at the time of application. The Section 18 label can be obtained from state and/or county authorities where it is valid. Please contact your Dow AgroSciences representative for further information.

Notice: Read the entire label. Use only according to label directions. **Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies at end of state specific Section 18 label. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Est. _____

[®]Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

**Produced for
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268**

NET WEIGHT ___ LB

(Cover, shipping container):

(logo) Dow Agrosciences

Transform[®] WG

INSECTICIDE

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Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls

- Shoes plus socks

Storage and Disposal

Do not contaminate water, food or feed by storage and disposal.

Pesticide Storage: Store in original container only.

Pesticide Disposal: Return any unopened, unused container of this unregistered product to the manufacturer or distributor, or dispose of it in accordance with Resource Conservation and Recovery Act regulations, following the expiration of the emergency exemption.

Container Handling: Nonrefillable container. Do not reuse or refill this container.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

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Refer to state-specific Section 18 label for additional precautionary information including Directions for Use. This product cannot be used without a valid state-specific Section 18 label. The Section 18 label must be in the possession of the user at the time of application. The Section 18 label can be obtained from state and/or county authorities where it is valid. Please contact your Dow AgroSciences representative for further information.

Notice: Read the entire label. Use only according to label directions. **Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies at end of state specific Section 18 label. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Est. _____

®Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

**Produced for
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268**

NET WEIGHT ____ LB

Accepted __/__/__



Dow AgroSciences

Dow AgroSciences LLC

9330 Zionsville Road

Indianapolis, IN 46268-1054 USA

Transform[®] WG

For Control of Sugarcane Aphid (*Melanaphis sacchari*) in Sorghum

Section 18 Emergency Exemption

File symbol: 16TX02

FOR DISTRIBUTION AND USE ONLY IN TEXAS UNDER SECTION 18 EMERGENCY EXEMPTION

This Section 18 Emergency Exemption is effective April 8, 2016 and expires April 8, 2017.

- This labeling must be in the possession of the user at the time of application.
- It is in violation of federal law to use this product in a manner inconsistent with its labeling.
- Read the label affixed to the container for Transform[®] WG insecticide before applying. Carefully follow all precautionary statements and applicable use directions.
- Any adverse effects resulting from the use of Transform WG under this emergency exemption must be immediately reported to the Texas Department of Agriculture

Directions for Use

Use Precautions

Integrated Pest Management (IPM) Programs

Transform WG is recommended for IPM programs in labeled crops. Apply Transform WG when field scouting indicates target pest densities have reached the economic threshold, i.e., the point at which the insect population must be reduced to avoid economic losses beyond the cost of control. Other than reducing the target pest species as a food source, Transform WG does not have a significant impact on most parasitic insects or the natural predaceous arthropod complex in treated crops, including big-eyed bugs, ladybird beetles, flower bugs, lacewings, minute pirate bugs, damsel bugs, assassin bugs, predatory mites or spiders. The feeding activities of these beneficials will aid in natural control of other insects and reduce the likelihood of secondary pest outbreaks. If Transform WG is tank mixed with any insecticide that reduces its selectivity in preserving beneficial predatory insects, the full benefit of Transform WG in an IPM program may be reduced.

Insecticide Resistance Management (IRM)

Transform WG contains a Group 4C insecticide. Insect biotypes with acquired resistance to Group 4C insecticides may eventually dominate the insect population if Group 4C insecticides are used repeatedly in the same field or area, or in successive years as the primary method of control for targeted species. This may result in partial or total loss of control of those species by Transform WG or other Group 4C insecticides.

To delay development of insecticide resistance, the following practices are recommended:

- Avoid consecutive use of insecticides on succeeding generations with the same mode of action (same insecticide subgroup, 4C) on the same insect species.
- Consider tank mixtures or premix products containing insecticides with different modes of action (different insecticide groups) provided the products are registered for the intended use.
- Base insecticide use upon comprehensive IPM programs.
- Monitor treated insect populations in the field for loss of effectiveness.
- Do not treat seedling plants grown for transplant in greenhouses, shade houses, or field plots.
- Contact your local extension specialist, certified crop advisor, and/or manufacturer for insecticide resistance management and/or IPM recommendations for the specific site and resistant pest problems.
- For further information or to report suspected resistance, you may contact Dow AgroSciences by calling 800-258-3033.

Mixing Directions

Application Rate Reference Table

Application Rate of Transform WG (oz/acre)	Active Ingredient Equivalent (lb ai/acre)
0.75	0.023
1.5	0.047

Transform WG – Alone

Fill the spray tank with water to about 1/2 of the required spray volume. Start agitation and add the required amount of Transform WG. Continue agitation while mixing and filling the spray tank to the required spray volume. Maintain sufficient agitation during application to ensure uniformity of the spray mix. Do not allow water or spray mixture to back-siphon into the water source.

Transform WG - Tank Mix

When tank mixing Transform WG with other materials, conduct a compatibility test (jar test) using relative proportions of the tank mix ingredients prior to mixing ingredients in the spray tank. If foliar fertilizers are used, the jar test should be repeated with each batch of fertilizer utilizing the mixing water source. Vigorous, continuous agitation during mixing, filling and throughout application is required for all tank mixes. Sparger pipe agitators generally provide the most effective agitation in spray tanks. To prevent foaming in the spray tank, avoid stirring or splashing air into the spray mixture.

Mixing Order for Tank Mixes: Fill the spray tank with water to 1/4 to 1/3 of the required spray volume. Start agitation. Add different formulation types in the order indicated below, allowing time for complete dispersion and mixing after addition of each product. Allow extra dispersion and mixing time for dry flowable products.

Add different formulation types in the following order:

1. Transform WG and other water dispersible granules
2. Wettable powders
3. Suspension concentrates and other liquids

Maintain agitation and fill spray tank to 3/4 of total spray volume. Then add:

4. Emulsifiable concentrates and water-based solutions
5. Spray adjuvants, surfactants and oils
6. Foliar fertilizers

Finish filling the spray tank. Maintain continuous agitation during mixing, final filling and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be resuspended before spraying is resumed. A sparger agitator is particularly useful for this purpose.

Premixing: Dry and flowable formulations may be premixed with water (slurried) and added to the spray tank through a 20 to 35 mesh screen. This procedure assures good initial dispersion of these formulation types.

Application Directions

Proper application techniques help ensure thorough spray coverage and correct dosage for optimum insect control. Apply Transform WG as a foliar spray at the rate indicated for target pest. The following directions are provided for ground and aerial application of Transform WG. Attention should be given to sprayer speed and calibration, wind speed, and foliar canopy to ensure adequate spray coverage.

Spray Drift Management

Wind: Do not apply when wind speed exceeds 10 mph as uneven spray coverage and drift may result.

Temperature Inversions: Do not make ground or aerial applications during a temperature inversion. Temperature inversions are characterized by stable air and increasing temperatures with height above the ground. Mist or fog may indicate the presence of an inversion in humid areas. The applicator may detect the presence of an inversion by producing smoke and observing a smoke layer near the ground surface.

Droplet Size: Use only medium to coarse spray nozzles (i.e., with median droplet size if 341 µm or greater) for ground and non-ULV aerial application according to ASABE (S-572.1) definition for standard nozzles. In conditions of low humidity and high temperatures, applicators should use a coarser droplet size except where indicated for specific crops.

Ground Application

To prevent drift from groundboom applications, apply using a nozzle height of no more than 4 feet above the ground or crop canopy. Shut off the sprayer when turning at row ends. Risk of exposure to sensitive aquatic areas can be reduced by avoiding applications when wind directions are toward the aquatic area.

Row Crop Application

Use calibrated power-operated ground spray equipment capable of providing uniform coverage of the target crop. Orient the boom and nozzles to obtain uniform crop coverage. Use a minimum of 5 to 10 gallons per acre, increasing volume with crop size and/or pest pressure. Use hollow cone, twin jet flat fan nozzles or other atomizer suitable for insecticide spraying to provide a fine to coarse spray quality (per ASABE S-572.1, see nozzle catalogs). Under certain conditions, drop nozzles may be required to obtain complete coverage of plant surfaces. Follow manufacturer's specifications for ideal nozzle spacing and spray pressure. Minimize boom height to optimize uniformity of coverage and maximize deposition (optimize on-target deposition) to reduce drift.

Aerial Application

Apply in a minimum spray volume of 3 gallons per acre. Mount the spray boom on the aircraft so as to minimize drift caused by wing tip or rotor vortices. Use the minimum practical boom length and do not exceed 75% of the wing span or 80% of the rotor diameter. Flight speed and nozzle orientation must be considered in determining droplet size. Spray must be released at the lowest height consistent with pest control and flight safety. Do not release spray at a height greater than 10 feet above the crop canopy unless a greater height is required for aircraft safety. When applications are made with a crosswind, the swath will be displaced downwind. The applicator must compensate for this displacement at the downwind edge of the application area by adjusting the path of the aircraft upwind.

Spray Adjuvants

The addition of agricultural adjuvants to sprays of Transform WG may improve initial spray deposits, redistribution and weatherability. Select adjuvants that are recommended and registered for your specific use pattern and follow their use directions. When an adjuvant is to be used with this product, Dow AgroSciences recommends the use of a Chemical Producers and Distributors Association certified adjuvant. Always add adjuvants last in the mixing process.

Pests and Application Rates:

Pests	Transform WG (oz/acre)	Comments
Sugarcane aphid	0.75 – 1.5 (0.023 – 0.047 lb ai/acre)	Use a higher rate in the rate range for heavy pest populations.

Application Timing: Treat in accordance with local economic thresholds. Consult your Dow AgroSciences representative, cooperative extension service, certified crop advisor or state agricultural experiment station for any additional local use recommendations for your area.

Application Method: Control of sugarcane aphid may be contingent on thorough coverage to the crop. Use sufficient water to get full coverage of the canopy. It is recommended that a minimum of 5 gallons of water be applied by air.

Restrictions:

- **Preharvest Interval:** Do not apply within 14 days of grain or straw harvest or within 7 days of grazing, or forage, fodder, or hay harvest.
- A restricted entry interval (REI) of 24 hours must be observed.
- Do not make more than two applications per acre per year.
- **Minimum Treatment Interval:** Do not make applications less than 14 days apart.
- Do not apply more than a total of 3.0 oz of Transform WG (0.09 lb ai of sulfoxaflor) per acre per year.

- Do not apply product \leq 3 days pre-bloom until after seed set.

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