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Potential Spray Drift Damage: What Steps to Take?

by

Tiffany Dowell Lashmet

Texas A&M AgriLife Extension Service



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An Agricultural & Food Law Consortium Project

Potential Spray Drift Damage: What Steps to Take?

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As many farmers know all too well, applications of various pesticides can result in drift and cause damage to neighboring property owners. In recent years, incidences of spray drift damage have been frequent and well-publicized. In the event a farmer discovers damage to his or her own crop, it is important for the injured producer to know some steps to take.

➤ **Document, Document, Document**

First and foremost, any farmer who suspects possible injury from drift should document all potential evidence, including taking photographs or samples of damaged crops or foliage, keeping a log of spray applications made by neighboring landowners, noting any custom applicators applying pesticide in the area, documenting environmental conditions like wind speed, direction, and temperatures, and getting statements from any witnesses who might have seen recent pesticide applications. Photographs should be taken continually for several days, as the full extent of damage may not occur for several weeks after application. The more documentation a landowner has, the better his chances of recovery will be; whether it is from the offender, the offender's insurance or potentially even the injured party's insurance.

➤ **Talk with Neighbors**

Taking time to talk with neighboring landowners can be very important. First, before any pesticide is sprayed during planting season, having a conversation with neighboring landowners about who is growing what crops, what tolerant varieties may be planted in certain areas, and identifying nearby sensitive crops can help avoid damage in the first place. Second, if damage has occurred, it can be helpful to visit with surrounding landowners to determine if they, too, suffered damage from chemical drift. This can help trace where the drift may have come from. Third, if an injured farmer is able to determine who sprayed the pesticide that caused the damage, it may be possible to calmly discuss the issue and begin to work out some sort of agreement, rather than having to resort to getting the State involved or to civil litigation.

➤ **Contact State Agency**

Every state has an agency that governs pesticide application and investigates complaints. For example, in Texas, this falls under the jurisdiction of the Texas Department of Agriculture. In Arkansas, it is the Arkansas Plant Board. In Indiana, it is the Office of Indiana State Chemist.

The information contained in this factsheet is provided for **educational purposes only**. It is **not legal advice**, and is not a substitute for the potential need to consult with a competent attorney licensed to practice law in the appropriate jurisdiction.

When potential drift damage occurs, contacting the appropriate state agency in the particular location is an important step. These agencies can conduct investigations to determine what chemical caused the damage, who may have applied that chemical nearby, and whether state regulation and label requirements were complied with during application. If the agency discovers a violation of applicable regulations has occurred, they can levy fines against the pesticide applicator and may impose restrictions on that person's ability to continue applying pesticides.

It is important to note, however, that any fines levied by the State are regulatory fines paid to the agency. This money does not provide monetary compensation to the damaged farmer. An injured farmer seeking compensation would have to seek remedy through negotiating with the applicator or instituting a civil lawsuit.

➤ **Consider Seeking Monetary Damages**

In many instances, damage to a crop from spray drift can result in significant monetary damages for the injured farmer. The next step to consider is seeking compensation in the form of monetary damages from the person who applied the pesticide.

An initial consideration is to analyze who may be proper defendants in the case. If a landowner used a custom applicator to apply pesticides, the injured farmer will likely need to consider whether the landowner, custom applicator, or both may be proper defendants. This is a decision that will be made in coordination with your attorney after looking at all the facts.

Once potential defendants have been identified, it is important to determine the status of potentially applicable insurance policies. Crop insurance policies through USDA Risk Management Agency likely will not allow loss recovery for an injured farmer due to pesticide drift. It is important to determine whether the farmer applying the pesticides has a liability insurance policy that may be applicable to pesticide drift claims. Additionally, if a custom applicator was used, the injured party should determine who that applicator was and what type of insurance coverage he or she may have.

Next, an injured party should consider what legal claims may be appropriate in the particular situation. The most common legal claims seen when spray drift occurs have been negligence, nuisance, and trespass. Laws vary greatly by state, so farmers should talk with an attorney licensed to practice in their own state to analyze what potential legal claims may be available, whether proceeding with a civil lawsuit makes good financial sense, and what statutes of limitations may apply to potential claims.

➤ **Conclusion**

Pesticide drift is a serious issue that can have real, significant, and far-reaching impacts on an injured farmer. Understanding the steps to take in the event this damage occurs is important and may help an injured farmer recover from current concerns while avoiding future issues.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

October 12, 2017

Jeffery H. Birk PhD
Regulatory Manager
BASF
26 Davis Drive
Research Triangle Park, NC 27709

Subject: Registration Amendment – Label Amendment to Change Directions for Use and additional Terms and Conditions to the Registration as Registered on November 9, 2016 for Use on Dicamba-tolerant Cotton and Dicamba-tolerant Soybeans
Product Name: Engenia Herbicide
EPA Registration Number: 7969-345
Application Date: October 12, 2017
Decision Number: 534661

Dear Dr. Birk:

In response to the high number of crop damage incidents reported to EPA since June 2017, BASF submitted a label amendment to change the directions for use on its product as well as a request to amend its registration to include additional terms and conditions. EPA approves the labeling proposed by BASF as well as the additional terms and conditions of registration. EPA has determined that the Engenia Herbicide (EPA reg. no. 7969-345) labeling and registration continue to meet the standard of registration with the requested amendment as it did on December 20, 2016 when EPA registered these new uses. The amendment approved through this letter includes additional restrictions further minimizing off-field movement of the active ingredient dicamba and do not affect the conclusions in the supporting assessment of risk. EPA accordingly continues to rely on all the assessments that supported the new uses, and therefore does not require a revised endangered species effects determination, nor any other new risk assessment. This approval contains registration terms and conditions that are in addition to the conditions set forth in the new use approval granted on December 20, 2016. These terms and conditions do not supersede any conditions that were previously imposed on this registration. Therefore, BASF continues to be subject to existing conditions on its registration and any deadlines connected with them, including but not limited to the automatic expiration date of December 20, 2018. The amended label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable under FIFRA Section 3(c)(7)(B) subject to the following additional terms and conditions to ensure that the new labeling is provided at the point of sale for the 2018 use season.

The next label printing of this product, which should occur as soon as practicable, must use this approved labeling unless subsequent changes have been approved. You must submit one copy of the final printed labeling before you release the product for shipment with the new labeling. After the next printing, you may only distribute or sell this product if it bears this new

revised labeling or subsequently approved labeling. “To distribute or sell” is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR 152.3. In order to assure the new labeling is implemented for use in the 2018 application season, the appended terms and conditions (listed here) have been added to the existing terms and conditions of this registration. BASF, the registrant, will:

1. Make every effort to relabel all existing Engenia herbicide product inventories within the channels of trade and within BASF’s possession.
2. Relabel existing bulk storage units in place with new labeling. Relabeling will be completed at an EPA registered establishment.
3. Return existing minibulk containers to an approved EPA Establishment site and relabel with new labeling.
4. Return existing 2 x 2.5 gallon cartons and jugs to an approved EPA Establishment site and either relabel or exchange product for new product containing the new labeling.
5. Report as required by FIFRA and implementing regulations.
6. Communicate to retailers to not sell product until relabeling is appropriately conducted.
7. Inform retailers who are not registered establishments the importance of the new labeling and to contact BASF immediately, so that BASF can reclaim the retailer inventory and provide replacement product with labeling updated in a registered establishment.
8. Provide a copy to EPA of the communications used to inform retailers and others as described above.

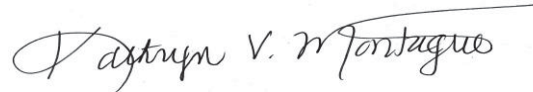
Please be aware that by adding/retaining a reference to the company’s website on your label, the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product’s label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA’s Office of Enforcement and Compliance.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling including all supplemental labels. The new labeling and terms and conditions of registration are hereby granted. As with the December 20, 2016 new use approvals for use of Engenia Herbicide on dicamba-tolerant cotton and dicamba-tolerant soybeans, if these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6.

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EPA Reg. No. 7969-345
Decision No. 534661

If you have any questions, please contact me by phone at 703-305-1243, or via email at montague.kathryn@epa.gov.

Sincerely,

A handwritten signature in cursive script that reads "Kathryn V. Montague". The signature is written in black ink and is positioned above the typed name.

Kathryn Montague, Product Manager 23
Herbicide Branch
Registration Division (7505P)
Office of Pesticide Programs

Enclosure(s)

RESTRICTED USE PESTICIDE

For Retail Sale To and Use Only by Certified Applicators or persons under their direct supervision, and only for those uses covered by Certified Applicators certification.

This label supersedes any previously issued labeling, including previously issued supplemental labeling.

This EPA registration expires December 20, 2018 unless the US EPA determines before that date that off-site incidents are not occurring at unacceptable frequencies or levels. **DO NOT** use or distribute this product after December 20, 2018, unless you visit www.EngeniaQuestions.com and can verify that the EPA has amended this expiration date.



Group 4 Herbicide

We create chemistry

Engenia[®]

Herbicide

ACCEPTED

10/12/2017

Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 7969-345

For weed control in Dicamba-tolerant (DT) cotton[†]; Dicamba-tolerant (DT) soybean[†]; asparagus; conservation reserve programs (CRP); corn; cotton; fallow cropland; farmstead turf (noncropland) and sod farms; grass grown for seed; pasture, hay, rangeland, and farmstead (noncropland); proso millet; small grain; sorghum; soybean; and sugarcane

[†]Only for use in states listed as US EPA approved in the **Dicamba-tolerant (DT) Crops** section of this label.

Active Ingredient*:

Dicamba: N,N-Bis-(3-aminopropyl)methylamine salt of 3,6-dichloro-*o*-anisic acid 60.8%

Other Ingredients: 39.2%

Total: 100.0%

*Contains 48.38% dicamba (5 pounds acid equivalent per gallon or 600 grams per liter)

EPA Reg. No. 7969-345

EPA Est. No.

**KEEP OUT OF REACH OF CHILDREN
CAUTION/PRECAUTION**

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.)

See inside for complete **First Aid, Precautionary Statements, Directions For Use, Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Net Contents:

BASF Corporation
26 Davis Drive, Research Triangle Park, NC 27709

FIRST AID

If swallowed	<ul style="list-style-type: none">• 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.
If inhaled	<ul style="list-style-type: none">• Move person to fresh air.• If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably by mouth to mouth, if possible.• Call a poison control center or doctor for further treatment advice.

HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Corporation for emergency medical treatment information: 1-800-832-HELP (4357).

Precautionary Statements

Hazards to Humans and Domestic Animals

CAUTION. Harmful if swallowed or inhaled. Avoid breathing vapor or spray mist. Remove and wash contaminated clothing before reuse. Wash thoroughly with soap and water after and before eating, drinking, chewing gum, using tobacco, or using the toilet.

Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Personal Protective Equipment (PPE)

All mixers, loaders, applicators, and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Waterproof gloves
- A NIOSH-approved dust/mist filtering respirator with any R, P, or HE filter or a NIOSH-approved number prefix TC-84A.

See **Engineering Controls** for additional requirements. Follow the manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

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

DO NOT apply directly to water, or 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 washwater or rinsate. Apply this product only as directed on the label.

This chemical is known to leach through soil into groundwater under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Ground and Surface Water Protection

Point-source Contamination

To prevent point-source contamination, **DO NOT** mix or load this pesticide product within 50 feet of wells (including abandoned wells and drainage wells), sinkholes, perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs. **DO NOT** apply pesticide product within 50 feet of wells. This setback does not apply to properly capped or plugged abandoned wells and does not apply to impervious pad or properly diked mixing/loading areas as described below.

Mixing, loading, rinsing, or washing operations performed within 50 feet of a well are allowed only when conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be on or move across the pad. The pad must be self-contained to prevent surface water flow over or from the pad. The pad capacity must be

maintained at 110% that of the largest pesticide container or application equipment used on the pad and have sufficient capacity to contain all product spills, equipment or container leaks, equipment washwater, and rainwater that may fall on the pad. The containment capacity does not apply to vehicles delivering pesticide shipments to the mixing/loading site. States may have in effect additional requirements regarding wellhead setbacks and operational containment.

Care must be taken when using this product to prevent:

- Back-siphoning into wells
- Spills
- Improper disposal of excess pesticide, spray mixtures, or rinsate

Check valves or antisiphoning devices must be used on all mixing equipment.

Movement by Surface Runoff or Through Soil

DO NOT apply under conditions which favor runoff.

DO NOT apply to impervious substrates such as paved or highly compacted surfaces in areas with high potential for groundwater contamination. Groundwater contamination may occur in areas where soils are permeable or coarse and groundwater is near the surface. **DO NOT** apply to soils classified as sand with less than 3% organic matter and where groundwater depth is shallow. To minimize the possibility of groundwater contamination, carefully follow the specified rates as affected by soil type in the **Crop-specific Information** section of this label.

Movement by Water Erosion of Treated Soil

DO NOT apply this product through any type of irrigation system including sprinkler, drip, flood, or furrow irrigation. Ensure treated areas have received at least 1/2-inch rainfall (or irrigation) before using tailwater for subsequent irrigation of other fields.

Endangered Species

The use of any pesticide in a manner that may kill or otherwise harm an endangered species or adversely modify their habitat is a violation of federal law.

Directions For Use

RESTRICTED USE PESTICIDE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. This labeling must be in the user's possession during application.

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.

Observe all precautions, restrictions, and limitations in this label and the labels of products used in combination with this product. Keep containers closed to avoid spills and contamination.

All applicable directions, restrictions, precautions, and **Conditions of Sale and Warranty** are to be followed.

RESTRICTED USE PESTICIDE APPLICATION RECORD KEEPING AND TRAINING REQUIREMENTS

Record Keeping Requirements

Applicators must keep the following records for a period of two years; records must be generated within 14 days of application and a record must be kept for every individual application. Records must be made available to State Pesticide Control Official(s), USDA, and EPA upon request. The following information must be recorded and kept as required by the Federal Pesticide Record Keeping Program, 7 CFR Part 110:

1. **Full name of the certified applicator**
2. **Certification number of the certified applicator**
3. **Product name**
4. **EPA registration number**
5. **Total amount applied**
6. **Application month, day, and year**
7. **Location of the application**
8. **Crop or site receiving the application**
9. **Size of area treated**
10. **Training Requirement:** proof that the applicator completed training described in this section.
11. **Application Timing:** whether the applicator applied this product preemergence or, the number of days after planting if the applicator applied this product postemergence.
12. **Receipts of purchase:** receipts for the purchase of this product.
13. **Product Label:** a copy of this product label(s), and any state special local needs label that supplements this label.
14. **Sensitive Crops Awareness:** Document that the applicator checked an applicable sensitive crop registry; or document that the applicator surveyed neighboring fields for any sensitive areas or sensitive crops prior to application. At a minimum, records must include the date the applicator consulted the specialty crop registry or surveyed neighboring fields, and the name of the specialty crop registry the applicator consulted.
15. **Spray System Cleanout:** Document that the applicator complied with the section of this label titled: **"Spray System Equipment Clean-out"**. At a minimum, records must include the date the applicator performed the required cleanout, and cleanout method that the applicator followed.
16. **Tank Mix Products:** a list of all products (pesticides, adjuvants, and other products) that the applicator tank mixed with this product for each application. Include EPA registration numbers in the case of any pesticides.

(continued)

RESTRICTED USE PESTICIDE

APPLICATION RECORD KEEPING AND TRAINING REQUIREMENTS *(continued)*

17. **Start and Finish Times:** the time the applicator begins and the time the applicator completes applications of this product.
18. **Nozzle Selection:** which spray nozzle the applicator used to apply this product, and the nozzle pressure the applicator set the sprayer to.
19. **Air Temperature:** the air temperature at boom height at the time the applicator starts and finishes applications of this product.
20. **Wind Speed and Direction:** the wind speed at boom height at the time the applicator starts and finishes applications of this product, and the wind direction at the time the applicator starts and finishes applications of this product.

Training Requirements

Prior to applying this product, all applicators must complete dicamba or auxin-specific training. If training is available and required by the state where the applicator intends to apply this product, the applicator must complete that training before applying this product in-crop. If your state does not require auxin or dicamba-specific training, then the applicator must complete dicamba or auxin-specific training provided by one of the following sources: a) a registrant of a dicamba product approved for in-crop use with dicamba-tolerant crops, or b) a state or state-authorized provider.

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 intervals. The requirements in this box only apply to uses of this product that are covered by the WPS.

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 worn over short-sleeved shirt and short pants
- Chemical-resistant footwear plus socks
- Waterproof gloves
- Chemical-resistant headgear for overhead exposure
- Protective eyewear

STORAGE AND DISPOSAL

DO NOT contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

Pesticide Storage

Store in original container in a well-ventilated area separately from fertilizer, feed, and foodstuffs. Avoid cross-contamination with other pesticides. **Engenia® herbicide** freezes around 15° F and is stable under conditions of freezing and thawing. Product that has been frozen should be thawed and recirculated prior to use.

Pesticide Disposal

Wastes resulting from this product may be disposed of on-site or at an approved waste disposal facility. Pesticide, spray mixture, or rinsate that cannot be used according to label instructions must be disposed of according to federal, state or local procedures under **Subtitle C** of the **Resource Conservation and Recovery Act**. Improper disposal of excess pesticide, spray mix, or rinsate is a violation of federal law.

Container Handling

Nonrefillable Container. DO NOT reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Triple rinse containers small enough to shake (capacity ≤ 5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. 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.

Triple rinse containers too large to shake (capacity > 5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

(continued)

STORAGE AND DISPOSAL *(continued)*

Container Handling *(continued)*

Pressure rinse as follows: Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. 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.

Refillable Container. Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

Triple rinse as follows: To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

In Case of Emergency

In case of large-scale spill of this product, call:

- CHEMTREC 1-800-424-9300
- BASF Corporation 1-800-832-HELP (4357)

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- BASF Corporation 1-800-832-HELP (4357)

Steps to take if material is released or spilled:

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water.

Product Information

Engenia® herbicide is a water-soluble herbicide that provides postemergence and moderate rate-dependent residual control of many annual broadleaf weeds. **Engenia** is also active on many biennial and perennial broadleaf weeds as well as woody brush and vines (refer to **Table 1** for weeds controlled or suppressed).

Engenia can be used in specific field and row crops, fallow and postharvest croplands, and sod farms. **Engenia** does not control grass weeds and must be used sequentially or tank mixed with a grass herbicide for a complete weed control program. See **Tank Mixing Information** section for important information on herbicide tank mixes or **Crop-specific Information** section(s) for recommendations on sequential programs.

Table 1. Weeds Controlled or Suppressed

Engenia will control or suppress the following weeds when used at rates described in **Table 2**.

Common Name	Scientific Name
Annuals	
Alkanet	<i>Lithospermum arvense</i>
Amaranth, Palmer	<i>Amaranthus palmeri</i>
Amaranth, Powell	<i>Amaranthus powellii</i>
Amaranth, spiny	<i>Amaranthus spinosus</i>
Aster, slender	<i>Aster subulatus</i>
Bedstraw, catchweed	<i>Galium aparine</i>
Beggarweed, Florida	<i>Desmodium tortuosum</i>
Broomweed, common	<i>Gutierrezia dracunculoides</i>
Buckwheat, tartary	<i>Fagopyrum tataricum</i>
Buckwheat, wild	<i>Polygonum convolvulus</i>
Buffalobur	<i>Solanum rostratum</i>
Burclover, California	<i>Medicago polymorpha</i>
Burcucumber	<i>Sicyos angulatus</i>
Buttercup, corn	<i>Ranunculus arvensis</i>
Buttercup, creeping	<i>Ranunculus repens</i>
Buttercup, roughseed	<i>Ranunculus muricatus</i>
Buttercup, western field	<i>Ranunculus occidentalis</i>
Carpetweed	<i>Mollugo verticillata</i>
Catchfly, nightflowering	<i>Silene noctiflorum</i>
Chamomile, corn	<i>Anthemis arvensis</i>
Chervil, bur	<i>Anthriscus caucalis</i>
Chickweed, common	<i>Stellaria media</i>
Clover	<i>Trifolium</i> spp.
Cockle, corn	<i>Agrostemma githago</i>
Cockle, cow	<i>Vaccaria pyramidata</i>
Cocklebur, common	<i>Xanthium strumarium</i>
Copperleaf, hophornbeam	<i>Acalypha ostryifolia</i>
Cornflower	<i>Centaurea cyanus</i>
Croton, tropic	<i>Croton glandulosus</i>
Croton, woolly	<i>Croton capitatus</i>
Daisy, English	<i>Bellis perennis</i>

(continued)

Table 1. Weeds Controlled or Suppressed (continued)

Common Name	Scientific Name
Annuals (continued)	
Dragonhead, American	<i>Dracocephalum parviflorum</i>
Eveningprimrose, cutleaf	<i>Oenothera laciniata</i>
Falseflax, smallseed	<i>Camelina microcarpa</i>
Fleabane, hairy	<i>Conyza bonariensis</i>
Flixweed	<i>Descurainia sophia</i>
Fumitory	<i>Fumaria officinalis</i>
Goosefoot, nettleleaf	<i>Chenopodium murale</i>
Hempnettle	<i>Galeopsis tetrahit</i>
Henbit	<i>Lamium amplexicaule</i>
Horseweed (Marestail)	<i>Conyza canadensis</i>
Jacob's-ladder	<i>Polemonium caeruleum</i>
Jimsonweed	<i>Datura stramonium</i>
Knawel (German moss)	<i>Scleranthus annuus</i>
Knotweed, prostrate	<i>Polygonum aviculare</i>
Kochia ³	<i>Kochia scoparia</i>
Ladysthumb	<i>Polygonum persicaria</i>
Lambsquarters, common	<i>Chenopodium album</i>
Lettuce, miner's	<i>Claytonia perfoliata</i>
Lettuce, prickly	<i>Lactuca serriola</i>
Mallow, common	<i>Malva neglecta</i>
Mallow, Venice	<i>Hibiscus trionum</i>
Mayweed	<i>Anthemis cotula</i>
Morningglory, ivyleaf	<i>Ipomoea hederacea</i>
Morningglory, tall	<i>Ipomoea purpurea</i>
Mustard, black	<i>Brassica nigra</i>
Mustard, blue	<i>Chorispora tenella</i>
Mustard, tansy	<i>Descurainia pinnata</i>
Mustard, treacle	<i>Erysimum repandum</i>
Mustard, tumble	<i>Sisymbrium altissimum</i>
Mustard, wild	<i>Sinapis arvensis</i>
Mustard, yellowtop	<i>Sinapis</i> spp.
Nightshade, black	<i>Solanum nigrum</i>
Nightshade, cutleaf	<i>Solanum triflorum</i>
Pennycress, field	<i>Thlaspi arvense</i>
Pepperweed, Virginia	<i>Lepidium virginicum</i>
Pigweed, prostrate	<i>Amaranthus blitoides</i>
Pigweed, redroot (rough)	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Pigweed, tumble	<i>Amaranthus albus</i>
Pineappleweed	<i>Matricaria matricarioides</i>
Poorjoe	<i>Diodia teres</i>
Poppy, red horn	<i>Glaucium corniculatum</i>
Puncturevine	<i>Tribulus terrestris</i>
Purslane, common	<i>Portulaca oleracea</i>
Pusley, Florida	<i>Richardia scabra</i>
Radish, wild	<i>Raphanus raphanistrum</i>
Ragweed, common	<i>Ambrosia artemisiifolia</i>

(continued)

Table 1. Weeds Controlled or Suppressed (continued)

Common Name	Scientific Name
Annuals (continued)	
Ragweed, giant	<i>Ambrosia trifida</i>
Ragweed, lanceleaf	<i>Ambrosia bidentata</i>
Rocket, London	<i>Sisymbrium irio</i>
Rocket, yellow	<i>Barbarea vulgaris</i>
Rubberweed, bitter	<i>Hymenoxys odorata</i>
Salsify	<i>Tragopogon porrifolius</i>
Senna, coffee	<i>Senna occidentalis</i>
Sesbania, hemp	<i>Sesbania exaltata</i>
Shepherd's purse	<i>Capsella bursa-pastoris</i>
Sicklepod	<i>Cassia obtusifolia</i>
Sida, prickly (Teaweed)	<i>Sida spinosa</i>
Smartweed, green	<i>Polygonum scabrum</i>
Smartweed, Pennsylvania	<i>Polygonum pensylvanicum</i>
Sneezeweed, bitter	<i>Helenium amarum</i>
Sowthistle, annual	<i>Sonchus oleraceus</i>
Sowthistle, spiny	<i>Sonchus asper</i>
Spanish needles	<i>Bidens bipinnata</i>
Spikeweed, common	<i>Hemizonia pungens</i>
Spurge, prostrate	<i>Chamaesyce humistrata</i>
Spurry, corn	<i>Spergula arvensis</i>
Starbur, bristly	<i>Acanthospermum hispidum</i>
Starwort, little	<i>Stellaria graminea</i>
Sumpweed, rough	<i>Iva ciliata</i>
Sunflower, common (wild)	<i>Helianthus annuus</i>
Thistle, Russian	<i>Salsola iberica</i>
Velvetleaf	<i>Abutilon theophrasti</i>
Waterhemp	<i>Amaranthus tuberculatus</i>
Waterprimrose, winged	<i>Ludwigia decurrens</i>
Wormwood	<i>Artemisia annua</i>
Biennials	
Burdock, common	<i>Arctium minus</i>
Carrot, wild	<i>Daucus carota</i>
Cockle, white	<i>Melandrium album</i>
Eveningprimrose, common	<i>Oenothera biennis</i>
Geranium, Carolina	<i>Geranium carolinianum</i>
Gromwell	<i>Lithospermum</i> spp.
Knapweed, diffuse	<i>Centaurea diffusa</i>
Knapweed, spotted	<i>Centaurea maculosa</i>
Mallow, dwarf	<i>Malva borealis</i>
Plantain, bracted	<i>Plantago aristata</i>
Ragwort, tansy	<i>Senecio jacobaea</i>
Starthistle, yellow	<i>Centaurea solstitialis</i>
Sweetclover	<i>Melilotus</i> spp.
Teasel	<i>Dipsacus sativus</i>
Thistle, bull	<i>Cirsium vulgare</i>
Thistle, musk	<i>Carduus nutans</i>
Thistle, plumeless	<i>Carduus acanthoides</i>
Thistle, variegated (milk)	<i>Silybum marianum</i>

(continued)

Table 1. Weeds Controlled or Suppressed (continued)

Common Name	Scientific Name
Perennials¹	
Alfalfa	<i>Medicago sativa</i>
Apple, tropical soda	<i>Solanum viarum</i>
Artichoke, Jerusalem	<i>Helianthus tuberosus</i>
Aster, spiny	<i>Aster spinosus</i>
Aster, whiteheath	<i>Aster pilosus</i>
Bedstraw, smooth	<i>Gallium mollugo</i>
Bindweed, field	<i>Convolvulus arvensis</i>
Bindweed, hedge	<i>Calystegia sepium</i>
Blueweed, Texas	<i>Helianthus ciliaris</i>
Bursage, woollyleaf	<i>Ambrosia grayi</i>
Buttercup, tall	<i>Ranunculus acris</i>
Campion, bladder	<i>Silene vulgaris</i>
Chickweed, field	<i>Cerastium arvense</i>
Chickweed, mouseear	<i>Cerastium vulgatum</i>
Chicory	<i>Cichorium intybus</i>
Clover, hop	<i>Trifolium aureum</i>
Dandelion, common	<i>Taraxacum officinale</i>
Dock, broadleaf (Bitterdock)	<i>Rumex obtusifolius</i>
Dock, curly	<i>Rumex crispus</i>
Dogbane, hemp	<i>Apocynum cannabinum</i>
Dogfennel (Cypressweed)	<i>Eupatorium capillifolium</i>
Fern, bracken	<i>Pteridium aquilinum</i>
Garlic, wild	<i>Allium vineale</i>
Goldenrod, Canada	<i>Solidago canadensis</i>
Goldenrod, Missouri	<i>Solidago missouriensis</i>
Goldenweed, common	<i>Isocoma coronopifolia</i>
Hawkweed	<i>Hieracium</i> spp.
Henbane, black	<i>Hyoscyamus niger</i>
Horsenettle, Carolina	<i>Solanum carolinense</i>
Ironweed	<i>Vernonia</i> spp.
Knapweed, black	<i>Centaurea nigra</i>
Knapweed, Russian	<i>Centaurea repens</i>
Lespedeza, sericea	<i>Lespedeza cuneata</i>
Milkweed, climbing	<i>Sarcostemma cyanchoides</i>
Milkweed, common	<i>Asclepias syriaca</i>
Milkweed, honeyvine	<i>Ampelamus albidus</i>
Milkweed, western whorled	<i>Asclepias subverticillata</i>
Nettle, stinging	<i>Urtica dioica</i>
Nightshade, silverleaf	<i>Solanum elaeagnifolium</i>
Onion, wild	<i>Allium canadense</i>
Plantain, broadleaf	<i>Plantago major</i>
Plantain, buckhorn	<i>Plantago lanceolata</i>
Pokeweed	<i>Phytolacca americana</i>
Ragweed, western	<i>Ambrosia psilostachya</i>
Redvine	<i>Brunnichia ovata</i>
Smartweed, swamp	<i>Polygonum coccineum</i>
Snakeweed, broom	<i>Gutierrezia sarothrae</i>

(continued)

Table 1. Weeds Controlled or Suppressed (continued)

Common Name	Scientific Name
Perennials¹ (continued)	
Sorrel, red (Sheep sorrel)	<i>Rumex acetosella</i>
Sowthistle, perennial	<i>Sonchus arvensis</i>
Spurge, leafy	<i>Euphorbia esula</i>
Sundrop	<i>Oenothera perennis</i>
Thistle, Canada	<i>Cirsium arvense</i>
Thistle, Scotch	<i>Onopordum acanthium</i>
Toadflax, Dalmatian	<i>Linaria genistifolia</i>
Trumpet creeper	<i>Campsis radicans</i>
Vetch	<i>Vicia</i> spp.
Waterhemlock, spotted	<i>Cicuta maculata</i>
Waterprimrose, creeping	<i>Ludwigia peploides</i>
Woodsorrel, creeping	<i>Oxalis corniculata</i>
Woodsorrel, yellow	<i>Oxalis stricta</i>
Wormwood, Louisiana	<i>Artemisia ludoviciana</i>
Yankee weed	<i>Eupatorium compositifolium</i>
Yarrow, common	<i>Achillea millefolium</i>
Woody Brush and Vines^{1, 2}	
Alder	<i>Alnus</i> spp.
Ash	<i>Fraxinus</i> spp.
Basswood	<i>Tilia americana</i>
Beech	<i>Fagus</i> spp.
Birch	<i>Betula</i> spp.
Cherry	<i>Prunus</i> spp.
Chinquapin	<i>Chrysolepis chrysophylla</i>
Cottonwood	<i>Populus deltoides</i>
Cucumbertree	<i>Magnolia acuminata</i>
Elm	<i>Ulmus</i> spp.
Grape	<i>Vitus</i> spp.
Hemlock	<i>Tsuga</i> spp.
Hickory	<i>Carya</i> spp.
Honeylocust	<i>Gleditsia triacanthos</i>
Honeysuckle	<i>Lonicera</i> spp.
Hornbeam	<i>Carpinus</i> spp.
Huckleberry	<i>Vaccinium arboreum</i>
Huisache	<i>Acacia farnesiana</i>
Ivy, poison	<i>Rhus radicans</i>
Kudzu	<i>Pueraria lobata</i>
Locust, black	<i>Robinia pseudoacacia</i>
Maple	<i>Acer</i> spp.
Mesquite	<i>Prosopis ruscifolia</i>
Oak	<i>Quercus</i> spp.
Oak, poison	<i>Rhus toxicodendron</i>
Olive, Russian	<i>Elaeagnus angustifolia</i>
Persimmon, eastern	<i>Diospyros virginiana</i>
Pine	<i>Pinus</i> spp.
Poplar	<i>Populus</i> spp.
Rabbitbrush	<i>Chrysothamnus pulchellus</i>

(continued)

Table 1. Weeds Controlled or Suppressed (continued)

Common Name	Scientific Name
Woody Brush and Vines ^{1,2} (continued)	
Rose, multiflora	<i>Rosa multiflorum</i>
Sassafras	<i>Sassafras albidum</i>
Serviceberry	<i>Amelanchier sanguinea</i>
Spicebush	<i>Lindera benzoin</i>
Spruce	<i>Picea</i> spp.
Sumac	<i>Rhus</i> spp.
Sycamore	<i>Platanus occidentalis</i>
Tarbrush	<i>Flourensia cernua</i>
Willow	<i>Salix</i> spp.
Witchhazel	<i>Hamamelis macrophylla</i>

¹ Suppression only.² Not for use in California.³ Except dicamba resistant.

Product Stewardship Practices

- Apply **Engenia**® herbicide to weeds 4 inches or less in size for best performance.
- Apply **Engenia** at the labeled rate. **DO NOT** apply at less than the labeled rate.
- Use **Engenia** as part of a herbicide program that includes the use of residual herbicides and herbicides with alternate sites of action to reduce resistance selection pressure.
- Select only EPA-approved nozzles that produce **extremely coarse to ultra-coarse** spray droplets. See www.engeniatankmix.com for the list of nozzles approved for use with this product.
- Maintain boom height 24 inches or less from target.
- Identify areas of sensitive nontarget plants and maintain proper setback distance from these areas.
- Thoroughly clean spray equipment before and after application.

Mode of Action

Dicamba, the active ingredient in **Engenia**, is a **Group 4** (WSSA) herbicide. Herbicides in this group mimic auxin (a plant hormone) resulting in a hormone imbalance in sensitive plants that interferes with normal plant growth (e.g. cell division, cell enlargement, and protein synthesis).

Engenia is readily absorbed by leaves, roots, and shoots; translocates throughout the plant; and accumulates in areas of active growth to provide postemergence control of emerged weeds as well as moderate residual control of germinating weed seeds.

Any weed population may contain plants naturally resistant to **Group 4** herbicides. Weeds resistant to **Group 4** herbicides may be effectively managed using herbicide(s) from a different group and/or by using cultural or mechanical practices. Report any incidence of non-performance of this product against a particular weed species at www.EngeniaQuestions.com. Consult your local BASF representative, state cooperative extension service, professional consultants, or other qualified authority to

determine appropriate actions if you suspect resistant weeds. Additional information about weeds which are known to be resistant to dicamba can be found at www.Resistance-Information.BASF.US.

Resistance Management

While weed resistance to **Group 4** herbicides is infrequent, populations of resistant biotypes are known to exist. Resistance management should be part of a diversified weed control strategy that integrates multiple options including chemical, cultural, and mechanical (tillage) control tactics. Cultural control tactics include crop rotation, proper fertilizer placement, optimum seeding rate/row spacing, and timely tillage.

To aid in the prevention of developing weeds resistant to this product, the following steps should be followed where practical:

- Start clean with tillage or an effective burndown herbicide program.
- **DO NOT** rely on a single herbicide site of action for weed control during the growing season.
- Scout fields before application to ensure herbicides and rates will be appropriate for the weed species and weed sizes present.
- Apply full labeled rates of **Engenia** for the most difficult-to-control weed in the field at the specified time (correct weed size) to minimize weed escapes.
- Use of preemergence herbicides that provide soil residual control of broadleaf and grass weeds is recommended to reduce early season weed competition and allow for more timely in-crop postemergence herbicide applications.
- Avoid application of herbicides with the same site of action more than twice a season.
- Scout fields after application to detect weed escapes or shifts in weed species.
- Report any incidence of non-performance of this product against a particular weed species to your BASF retailer, representative or online at www.EngeniaQuestions.com.
- If resistance is suspected, treat weed escapes with a herbicide having a mode of action other than **Group 4** and/or use non-chemical methods to remove escapes, as is practical, with the goal of preventing further seed production.
- For more information about weeds that are known to be resistant to dicamba go to www.Resistance-Information.BASF.US.

Additionally, users should follow as many of the following herbicide resistance management practices as is practical:

- Use a broad spectrum soil-applied herbicide with other modes of action as a foundation in a weed control program.
- Utilize sequential applications of herbicides with alternative modes of action.
- Rotate the use of this product with non-**Group 4** herbicides.
- Avoid making more than two applications of **Engenia** and any other **Group 4** herbicides within a single growing

season unless mixed with another mechanism of action with an overlapping spectrum for the difficult-to-control weeds.

- Incorporate non-chemical weed control practices, such as mechanical cultivation, crop rotation, cover crops and weed-free crop seeds, as part of an integrated weed control program.
- Thoroughly clean plant residues from equipment before and after leaving fields suspected to contain resistant weeds.
- Manage weeds in and around fields during and after harvest to reduce weed seed production.
- Contact the local agricultural extension service, BASF representative, ag retailer or crop consultant for further guidance on weed control practices as needed.

Crop Tolerance

Crops growing under normal environmental conditions are tolerant to **Engenia® herbicide** when applied according to label directions. Crop injury may occur under stressful growing conditions (e.g. low soil fertility, seedling disease, extreme hot or cold weather, excessive moisture, high soil pH, high soil salt concentration, drought).

Application Instructions

Apply **Engenia** by ground to actively growing weeds as a band, broadcast, or spot spray application for postemergence control of emerged weeds as well as moderate residual control of germinating weed seeds.

Make postemergence applications of **Engenia** when broadleaf weeds are small and actively growing. An adjuvant is recommended with **Engenia** for best postemergence activity; refer to **Tank Mixing Information** section and crop-specific information sections for details. Postemergence activity may be slowed or reduced under cloudy and/or foggy or cooler weather conditions, or when weeds are growing under drought or other stress conditions. When targeting dense weed populations and/or larger broadleaf weeds, use higher spray volumes and a higher application rate within an application rate range.

Cultivation should be delayed until 7 days after applying **Engenia** or a reduction in weed control may occur.

Use extreme care when applying **Engenia** to prevent injury to desirable plants. **Engenia** may cause injury to desirable sensitive plants when contacting their roots, stems, or foliage.

Application Rates

Always read and follow crop-specific use directions.

Table 2. Application Rate to Control or Suppress Target Weed by Weed Type and Growth Stage for Non-DT Use Sites

(See **Crop-specific Information** section for additional directions and exceptions)

Weed Type and Growth Stage	Rate/Acre ^{2,5} (fl ozs)
Annual	
Small, actively growing ¹ (less than 4-inches tall)	3.2 to 12.8
Small, actively growing (less than 4-inches tall) plus moderate residual control	12.8
Biennial	
Rosette diameter 1 to 3 inches ¹	6.4 to 12.8
Rosette diameter more than 3 inches	12.8
Perennial^{3,4}	
Top growth suppression	6.4 to 12.8
Top growth control and root suppression	12.8
Woody Brush and Vines⁴	
Top growth suppression	12.8

¹ Although rates below 12.8 fl ozs/A may provide adequate control of annual and biennial weeds, for optimum performance use listed rates or lower rates tank mixed with other herbicides that are effective on the same species and biotype.

² Use the higher rate within listed ranges when treating weeds resistant to other sites of action, dense vegetative growth, or weeds with a well-established root system. The higher rates also provide moderate residual annual weed control.

³ Refer to **Table 1** for use on perennials in California.

⁴ **Engenia** will suppress the top growth of herbaceous perennial and woody brush and vines and can be combined with other herbicides to improve control. Not for use in California.

⁵ **DO NOT** broadcast-apply more than 12.8 fl ozs/A per application. Retreatment or tank mixes may be necessary for best control of some weeds. However, sequential applications must not exceed a maximum cumulative total of 51.2 fl ozs/A of **Engenia** (2 lbs dicamba ae/A) per year.

Application Methods and Equipment

Apply **Engenia**[®] herbicide by ground. Thorough spray coverage is important for best broadleaf weed control and can be improved with adjuvant, nozzle, and spray volume selection.

Calibrate application equipment for accurate target spray volume and application rate to ensure uniform distribution of spray and to avoid spray drift to nontarget areas. Adjust equipment to maintain continuous agitation during spraying with good mechanical or bypass agitation. Avoid overlaps that will increase rates above the labeled use rates.

Engenia may be applied using water; consult crop-specific information sections of this label for other spray carrier options.

Ground Application

Banding Applications

When applying **Engenia** by banding, use the following formula to calculate the amount of herbicide and water volume needed:

$$\frac{\text{Bandwidth in inches}}{\text{Row width in inches}} \times \text{Broadcast rate per acre} = \text{Banding herbicide rate per acre}$$

$$\frac{\text{Bandwidth in inches}}{\text{Row width in inches}} \times \text{Broadcast volume per acre} = \text{Banding water volume per acre}$$

Broadcast Applications

Unless noted in the crop-specific information section, use a spray volume of 10 or more gallons of water per treated acre. Thorough coverage of existing vegetation is essential for postemergence applications; higher spray volumes may be necessary for optimum performance.

Wiper Applications

Engenia may be applied through wiper application equipment to control or suppress actively growing broadleaf weeds, brush, and vines. Use a 50% solution containing 1 part **Engenia** to 1 part water.

- **DO NOT** apply more than 12.8 fl ozs/A of **Engenia** [0.5 lb dicamba acid equivalent (ae) per acre] per application.
- **DO NOT** contact desirable vegetation with herbicide solution. Wiper application may be made to crops (including pastures) and noncropland areas described in this label.

EXCEPTION: DO NOT use wiper application on non-dicamba-tolerant cotton or soybean.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The spray system and weather-related factors determine the potential for spray drift. The applicator is responsible for considering these factors when making application decisions to avoid spray drift onto nontarget areas.

Applicators must follow application requirements to avoid spray drift hazards, including those found in this labeling and applicable state and local regulations and ordinances. Where states have more stringent regulations, they must be observed.

All application equipment must be properly maintained and calibrated using appropriate carriers.

DO NOT allow herbicide solution to drip, physically drift, or splash onto desirable vegetation because severe injury or destruction to desirable broadleaf plants could result. The following physical spray drift management requirements must be followed.

Controlling Droplets

Drift potential may be reduced by applying large droplets that provide sufficient coverage and control. Applying larger droplets can reduce drift potential, but will not prevent drift if the application is made improperly, or under unfavorable environmental conditions (see the **Temperature Inversions** and the **Wind Speed and Direction Requirements** sections).

- **Nozzle Type** - Use the **Turbo TeeJet**[®] TTI11004 nozzle when applying **Engenia**. **DO NOT** use any other nozzle unless specifically allowed by label. To find a list of approved nozzles visit www.engeniatankmix.com no more than seven days prior to applying **Engenia**.
- **Pressure** - **DO NOT** exceed the nozzle manufacturer's specified pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate (large orifice) nozzles instead of increasing pressure. Ensure sprayer rate controller hardware (if so equipped) does not allow pressure increases above the desired range.
- **Spray Volume** - Apply this product in a minimum of 10 gallons of spray solution per acre. Use a higher spray volume when treating dense vegetation. Higher spray volumes may also allow the use of larger nozzle orifices (sizes) which produce coarser spray droplets.
- **Equipment Ground Speed** - Select a ground speed that will deliver the desired spray volume while maintaining the desired spray pressure, but **DO NOT** exceed a ground speed of 15 miles per hour. Slower speeds generally result in better spray coverage and deposition on the target area. It is recommended that ground speed be reduced to 5 miles per hour when making applications to the edge of the treatment area.
- **Spray Boom Height** - Spray at the appropriate boom height based on nozzle selection and nozzle spacing, but **DO NOT** exceed a boom height of 24 inches above target pest or crop canopy. Set boom to lowest effective height over the target pest or crop canopy based on equipment manufacturer's directions. Automated boom height controllers are recommended with large booms to better maintain optimum nozzle to canopy height. Excessive boom height will increase the potential for spray drift.
- **Hooded Spray Booms** - Hooded spray booms are another tool that can be used to minimize spray drift

potential. **Engenia® herbicide** may be applied using a hooded spray boom in combination with approved nozzles; however, the applicator must ensure the configuration is compatible with equipment used.

Temperature Inversions

- **DO NOT** apply **Engenia** when temperature inversions exist at the field level.
- **Apply only during the following period:** sunrise until sunset.

Temperature inversions increase drift potential because fine droplets may remain suspended in the air longer after application. Suspended droplets can move in unpredictable directions because of the light, variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light-to-no wind.

Inversions begin to form as the sun sets and often continue into the morning before surface warming. Their presence can be indicated by ground fog, smoke not rising, dust hanging over a road, or presence of dew or frost. Smoke that layers and moves laterally (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing. Inversion conditions typically dissipate with increased winds (above 3 MPH) or when surface air begins to warm (3° F from morning low).

Sensitive Areas

Engenia should only be applied when the potential for drift to adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, or sensitive crop plants) is minimal (e.g. when the wind is blowing away from sensitive areas).

Maintain a 110 foot buffer when applying this product from the downwind outer edges of the field, less the distance of any of the adjacent areas specified below.

To maintain the required buffer zone:

- No application swath containing **Engenia** can be initiated in, or into an area that is within the applicable buffer distance.
- The following areas may be included in the buffer distance calculation when adjacent to field edges:
 1. Roads, paved or gravel surfaces.
 2. Agricultural fields that have been prepared for planting.
 3. Planted agricultural fields containing asparagus, corn, DT cotton, DT soybeans, sorghum, proso millet, small grains and sugarcane.
 4. Areas covered by the footprint of a building, shade house, silo, feed crib, or other man made structure with walls and or roof.

Sensitive Crops: Restrictions and precautions for the protection of sensitive crops.

- **DO NOT** apply under circumstances where spray drift may occur to food, forage, or other plantings that might

be damaged or the crops thereof rendered unfit for sale, use or consumption.

- During application and sprayer clean-out **DO NOT** allow contact of herbicide with foliage, green stems, exposed non-woody roots of crops, and desirable plants.

In addition to the required 110 foot down wind spray buffer, additional protections are required for dicamba sensitive crops. **DO NOT** apply when wind is blowing in the direction of neighboring sensitive crops.

Sensitive crops include, but are not limited to:

- non-DT soybeans
- cucumber and melons (**EPA Crop Group 9**)
- flowers
- fruit trees
- grapes
- ornamentals including greenhouse-grown and shade house-grown broadleaf plants
- peanuts
- peas and beans (**EPA Crop Group 6**)
- peppers, tomatoes, and other fruiting vegetables (**EPA Crop Group 8**)
- potato
- sweet potato
- tobacco

Severe injury or destruction could occur if any contact between this product and these plants occurs.

Survey the area before spraying: Small amounts of spray drift that may not be visible may injure sensitive broadleaf plants. Applicators are required to ensure that they are aware of the proximity to sensitive areas, and to avoid potential adverse effects from off-target movement of **Engenia**. Before making an application, the applicator must survey the application site for neighboring sensitive areas. The applicator must also consult sensitive crop registries to locate nearby sensitive areas where available.

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.

The interaction of equipment and weather related factors must be monitored to maximize performance and on-target spray deposition. The applicator is responsible for considering all of these factors when making a spray decision. The applicator is responsible for compliance with state and local pesticide drift regulations.

Wind Speed and Direction Requirements

- **Wind Speed** - 3 to 10 mph
- **Wind Direction** - Local terrain can influence wind patterns. Every applicator must be familiar with local wind patterns and how they affect drift.

Spray System Equipment Clean-out

As part of the Restricted Use Product requirements, applicators must document that they have complied with the **Spray System Equipment Clean-out** section of this label.

The applicator must ensure that the spray system used to apply **Engenia® herbicide** is clean before application. Small quantities of ammonium sulfate (AMS) can increase the volatility potential of **Engenia**.

Severe crop injury may occur if any **Engenia** remains in the spray equipment following application and is subsequently applied to sensitive crops. After using **Engenia**, clean all mixing and spray equipment (including tanks, pumps, lines, filters, screens, and nozzles) with a strong detergent based sprayer cleaner. Dispose of rinsate in compliance with local, state, and federal guidelines.

1. After spraying, drain the sprayer (including boom and lines). Avoid allowing the spray solution to remain in the spray boom lines overnight or for extended periods of time.
2. Flush tank, hoses, boom, and nozzles with clean water. Open boom ends and flush if so equipped.
3. Inspect and clean all strainers, screens, and filters.
4. Use commercial sprayer cleaner containing strong detergents according to the manufacturer's directions.
5. Wash all parts of the tank, including the inside top surface. Start agitation in the sprayer and thoroughly recirculate the cleaning solution for at least 15 minutes. All visible deposits must be removed from the spraying system.
6. Flush hoses, spray lines, and nozzles with the cleaning solution for at least 1 minute. Remove nozzles, screens, and strainers, and clean separately in the cleaning solution after completing the above procedure.
7. Drain pump, filter, and lines.
8. Rinse the complete spraying system with clean water.
9. Clean and rinse the exterior of the sprayer.
10. Appropriately dispose of all rinsate in compliance with local, state, and federal requirements.

Tank Mixing Information

Engenia may only be tank-mixed with products that have been tested and found by the EPA not to have an unreasonable adverse effect on the spray drift properties of **Engenia**. A list of those EPA approved products may be found at www.engeniatankmix.com. **DO NOT** tank mix any product with **Engenia** unless:

1. You check the list of EPA approved products for use with **Engenia** at www.engeniatankmix.com no more than 7 days before applying **Engenia**; and
2. The intended product tank-mix with **Engenia** is identified on that list of tested and approved products; and
3. The intended product to be tank-mixed with **Engenia** is not prohibited on this label.

4. Additional Warnings and Restrictions:

- Some COC, HSOC and MSO adjuvants may cause a temporary crop response.
- **DO NOT** tank mix products containing ammonium salts such as ammonium sulfate and urea ammonium nitrate.
- **DO NOT** add adjuvants that will further decrease pH or acidify the spray solution.
- Hard water does not usually affect the activity of **Engenia**; however, other tank mix components may be adversely affected (e.g. glyphosate). Use of an approved conditioning agent should be considered when hard water (i.e. total calcium, magnesium, and iron content above 500 ppm) is used as a spray carrier.
- Use of an approved neutral buffering agent may be warranted if the water source or tank mix components will create an acidic spray solution less than pH 5.
- Drift reduction agents listed on the website above can minimize the percentage of driftable fines. However, the applicator must check with the DRA manufacturer to determine if the approved DRA will work effectively with the spray nozzle, the spray pressure, and the desired spray solution.

For an up to date and complete list of approved tank mix options with **Engenia**, visit www.engeniatankmix.com.

Refer to the tank mix product labels to confirm that the respective tank mix products are registered for the specific crop use; follow required crop rotation restrictions. Read and follow the applicable restrictions and limitations and **Directions For Use** on all product labels involved in tank mixing. Always follow the most restrictive label use directions; refer to crop-specific information section for details.

Mixing **Engenia** with postemergence grass (graminicide) herbicides may reduce the effectiveness of those products. Follow graminicide label when mixing with **Engenia** to ensure optimum weed control. Physical incompatibility, reduced weed control, or crop injury may result from mixing **Engenia** with other pesticides, additives, nutritionals, etc.

Adjuvants. BASF recommends the use of quality adjuvants with **Engenia** such as **Astonish™**, **Class Act®**, **Ridion®**, **Grounded®**, **Iconic®**, **Jackhammer™ Elite**, **R-11®**, **Strike Force®**, and **Verifact**.

Compatibility Test for Mix Components

Before mixing components, always perform a compatibility jar test.

1. For 20 gallons per acre spray volume, use 3.3 cups (800 mL) of water. For other spray volumes, adjust rates accordingly. Only use water from the intended source at the source temperature.
2. Add components in the sequence indicated in the following **Mixing Order** instructions using 2 teaspoons for each pound or 1 teaspoon for each pint of labeled use rate per acre.
3. Cap the jar and invert 10 cycles between component additions.

4. When the components have all been added to the jar, let the solution stand for 15 minutes.
5. Evaluate the solution for uniformity and stability. The spray solution should not have free oil on the surface; fine particles that precipitate to the bottom; or thick (clabbered) texture. If the spray solution is not compatible, repeat the compatibility test with the addition of a suitable compatibility agent. If the solution is then compatible, use the compatibility agent as directed on its label. If the solution is still incompatible, **DO NOT** mix the ingredients in the same tank.

Mixing Order

Make sure each component is thoroughly mixed and suspended before adding tank mix partners. Except when mixing products in PVA bags, maintain constant agitation during mixing and application.

1. **Water** - Begin by agitating a thoroughly clean sprayer tank 1/2 to 3/4 full of clean water.
2. **Inductor** - If an inductor is used, rinse it thoroughly after each component has been added.
3. **Products in PVA bags** - Place any product contained in water-soluble PVA bags into the mixing tank. Wait until all water-soluble PVA bags have fully dissolved and the product is evenly mixed in the spray tank before continuing.
4. **Water-soluble additives**
5. **Water-dispersible products** (such as dry flowables, wettable powders, suspension concentrates, or suspo-emulsions)
6. **Water-soluble products and additives (Engenia® herbicide)**
7. **Emulsifiable concentrates** (including NIS and oil concentrate)
8. Remaining quantity of water

Maintain continuous and constant agitation throughout mixing and application until spraying is completed. If the spray mixture is allowed to settle for any period of time, thorough agitation is essential to resuspend the mixture before spraying is resumed. Continue agitation while spraying.

Use Precautions

- **Maximum Seasonal Use Rate** - Refer to crop-specific information sections for maximum seasonal application rates for each crop or use pattern.
- **Stress** - Application to crops under stress because of lack of moisture, hail damage, flooding, herbicide injury, mechanical injury, or widely fluctuating temperatures may result in crop injury.
- **Rainfast Period - Engenia** is rainfast 4 hours after application. Postemergence activity may be reduced if rain or irrigation occurs within 4 hours of application.

Use Restrictions

Applicator MUST ALSO follow restrictions under Crop-specific Information section(s).

- **DO NOT** apply this product aerially.
- **DO NOT** apply **Engenia** with ammonium-containing additives, conditioners, or fertilizers (e.g. AMS, UAN). Small quantities of AMS can greatly increase the volatility potential of dicamba.
- **DO NOT** apply **Engenia** if rain is expected within 24 hours after application.
- Apply **Engenia** at wind speeds between 3 and 10 mph.
- Apply **Engenia** only during the following period: sunrise until sunset.
- **DO NOT** contaminate irrigation ditches or water used for domestic purposes.
- **DO NOT** apply **Engenia** through any type of irrigation system (e.g. chemigation).
- **DO NOT** tank mix **Engenia** with **Lorsban® insecticide**.

Crop Rotation Restrictions

Use the following information to determine the required interval between **Engenia** application and rotational crop planting as well as replanting after crop failure because of environmental factors such as drought, frost, or hail. Determine the rotational crop interval for tank mix products and use the most restrictive interval of all products applied.

Table 3. Crop Rotation Restrictions by Application Rate

Crop	Engenia® herbicide (fl ozs/A)		
	≤ 6.4	9.6	12.8
	Rotational Crop Interval ¹ (days after application)		
Corn	0	0	0
Cotton, non-DT ²	21 [†]	28	42
Cotton, DT	0	0	0
Sorghum	14	21	28
Soybean, non-DT ²	14	21	28
Soybean, DT	0	0	0
Grasses ³ 30 inches or more annual precipitation	14	21	28
Grasses ³ less than 30-inches annual precipitation	21	28	42
All other crops	120	120	120

¹ **DO NOT** include time when the soil is frozen and days before receiving any required rainfall or overhead irrigation.

² Following application of **Engenia** and a minimum accumulation of 1 inch of rainfall or overhead irrigation, observe the indicated waiting interval.

³ Includes barley, oats, wheat, and other grass crops. Small grains may be planted with no waiting interval following **Engenia** applied at 3.2 fl ozs/A.

[†] **Missouri and Tennessee Only.** Following application of **Engenia**, wait until an accumulation of 1 inch of rainfall or irrigation followed by an interval of **14 days** per 6.4 fl ozs/A or less before planting cotton. This interval must be observed before planting cotton or severe crop injury may occur.

Crop-specific Information—Dicamba-tolerant (DT) Crops

Dicamba-tolerant (DT) Crops

Engenia® herbicide is EPA approved for use in DT crops in the following states, subject to county restrictions as noted:

Alabama, Arizona, Arkansas, Colorado, Delaware, Florida (excluding Palm Beach County), Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee (excluding Wilson County), Texas, Virginia, West Virginia, Wisconsin.

The following directions are specific for Engenia use in DT cotton and DT soybeans.

Depending on specific crop application directions, **Engenia** may be applied for postemergence control of emerged broadleaf weeds and/or residual control of germinating broadleaf weed seeds before crop planting (preplant and/or preseed) and after planting (preemergence, postemergence). Refer to **Table 1** for list of weeds controlled or suppressed.

Engenia may be applied preplant, at-planting, preemergence, and postemergence (in-crop) for weed control in DT cotton and DT soybeans.

Dicamba-tolerant (DT) Cotton

Engenia may be applied preplant surface, preemergence, or postemergence (over the top) to control or suppress many annual, biennial, and perennial broadleaf weeds (see **Table 1**) in dicamba-tolerant (DT) cotton. If **Engenia** is applied to non-dicamba-tolerant cotton other than as directed, severe crop injury will result. For non-dicamba-tolerant cotton information, see **Cotton** section in **Crop-specific Information** section.

Application Rates and Timings

Maximum Application Rates in DT Cotton

Application Timing	Amount (fl ozs/A)
Single Preplant Preemergence Postemergence	12.8 (0.5 lb dicamba ae/A)
All Applications Combined Total per Season	51.2 (2 lbs dicamba ae/A)
Total Preplant and Preemergence	25.6 (1 lb dicamba ae/A)
Total Postemergence	51.2 (2 lbs dicamba ae/A)

Application of **Engenia** plus specified adjuvants (refer to **Tank Mixing Information** section for details) may be made before and after cotton emergence. Separate sequential applications by 7 days or more. For best performance, apply **Engenia** when weeds are less than 4 inches in height and rosettes are less than 2-inches across. Timely application will improve control and reduce weed competition. Apply preplant, preemergence, and postemergence to DT cotton only by ground. **DO NOT** apply more than 51.2 fl ozs/A of **Engenia** per year (single growing season).

Preplant and Preemergence Applications

Engenia can be applied at 12.8 fl ozs/A before, during, or after planting DT cotton. **Engenia** will provide burndown of emerged weeds. Apply as a sequential application with other preemergence herbicides to control emerged grass weeds and other broadleaf weeds, and with a preemergence residual herbicide to control germinating weed seeds. Early season weed control is critical for minimizing weed competition and protecting crop yield potential.

Postemergence Applications

Apply **Engenia** postemergence at 12.8 fl ozs/A from cotton emergence up to 7 days before harvest. **DO NOT** apply more than 12.8 fl ozs/A in a single postemergence over-the-top application of **Engenia**.

For best weed control, **Engenia** applications should be made early in the season to small (less than 4-inches tall), actively growing weeds. Sequential postemergence applications may be necessary to control new weed flushes. Allow at least 7 days between applications. Avoid application of **Engenia** more than twice in a season to reduce resistance-selection pressure. Apply **Engenia** in a herbicide program that includes sequential application of herbicides with a different mechanism of action to control new weed regrowth.

Postemergence applications of **Engenia** mixed with some adjuvants may cause injury to DT cotton (see **Tank Mixing Information** section for details). Injury symptoms usually appear as necrotic spots on leaves. Potential for injury may be reduced when applications are made with spray volumes of at least 15 GPA and lower adjuvant rates. Symptomology is temporary with cotton recovering quickly after application.

Apply **Engenia** preplant, preemergence, and postemergence over the top by ground only.

Harvest Aid Applications

Engenia may be used for harvest aid in DT cotton. Apply **Engenia** as a broadcast spray by ground only. Applications must adhere to ground application requirements in this label; see the **Application Methods and Equipment** section. Apply **Engenia** at least 7 days before harvest.

Use with Other Herbicides

Broad-spectrum control of grass weeds or additional broadleaf weeds may require a sequential herbicide application. **Engenia® herbicide** may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Outlook® herbicide**
- **Prowl® H2O herbicide**
- glyphosate (e.g. **Roundup® herbicide**)

For approved tank mix options see www.engeniatankmix.com.

DT Cotton Restrictions

- **DO NOT** apply **Engenia** to non-dicamba-tolerant cotton varieties other than as directed or severe cotton injury will occur; refer to **Cotton** section in **Crop-specific Information** section.
- **DO NOT** apply harvest aid application of **Engenia** within 7 days of harvest.
- Use caution when tank mixing **Engenia** with approved emulsifiable concentrates (EC) or oil-based products that may increase the potential for crop injury.

Dicamba-tolerant (DT) Soybean

Engenia may be applied preplant surface, preemergence, or postemergence (over the top) to control or suppress many annual, biennial, and perennial broadleaf weeds (see **Table 1**) in dicamba-tolerant (DT) soybean. If **Engenia** is applied to non-dicamba-tolerant soybean other than as directed, severe crop injury will result. For non-dicamba-tolerant soybean information, see **Soybean** section in **Crop-specific Information** section.

Application Rates and Timings

Maximum Application Rates in DT Soybean

Application Timing	Amount (fl ozs/A)
Single Preplant Preemergence Postemergence	12.8 (0.5 lb dicamba ae/A)
All Applications Combined Total per Season	51.2 (2 lbs dicamba ae/A)
Total Preplant and Preemergence	25.6 (1 lb dicamba ae/A)
Total Postemergence	25.6 (1 lb dicamba ae/A)

Application of **Engenia** plus specified adjuvants (refer to **Tank Mixing Information** section for details) may be made before and after soybean emergence. Separate sequential applications by 7 days or more. For best performance, apply **Engenia** when weeds are less than 4 inches in height and rosettes are less than 2-inches across. Timely application will improve control and reduce weed competition. Apply preplant, preemergence, and postemergence to DT soybean only by ground.

Preplant and Preemergence Applications

Engenia can be applied at 12.8 fl ozs/A before, during, or after planting dicamba-tolerant soybean. **Engenia** will provide burndown of emerged weeds and moderate residual activity. Apply as a sequential application with other labeled herbicides to control emerged grass weeds and other broadleaf weeds, and with a preemergence residual herbicide to control germinating weed seeds. Early season weed control is critical for minimizing weed competition and protecting crop yield potential.

Postemergence Applications

Up to two postemergence applications using 12.8 fl ozs/A of **Engenia** per application may be made from soybean emergence up to and including beginning bloom (R1 growth stage of soybeans). Allow at least 7 days between applications. However, **DO NOT** apply more than a maximum cumulative total of 25.6 fl ozs/A of **Engenia** postemergence.

Engenia applications should be made to small (less than 4-inches tall), actively growing weeds. Sequential postemergence applications may be necessary to control new weed flushes. For best results, apply **Engenia** in a herbicide program that includes sequential application of herbicides with a different mechanism of action to control new weed growth.

Postemergence applications of **Engenia** may cause dicamba-tolerant soybeans to wilt or droop shortly after application. Symptomology is transient, and soybeans recover quickly after application.

Use with Other Herbicides

Broad-spectrum control of grass weeds or additional broadleaf weeds may require a sequential herbicide application. **Engenia**[®] herbicide may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Optill**[®] powered by **Kixor**[®] herbicide
- **Outlook**[®] herbicide
- **Prowl**[®] H2O herbicide
- **Pursuit**[®] herbicide
- **Raptor**[®] herbicide
- **Sharpen**[®] powered by **Kixor**[®] herbicide
- **Varisto**[®] herbicide
- **Verdict**[®] powered by **Kixor**[®] herbicide
- **Zidua**[®] herbicide
- **Zidua**[®] PRO powered by **Kixor**[®] herbicide
- clethodim (e.g. **Select Max**[®] herbicide)
- glyphosate (e.g. **Roundup**[®] herbicide)

For approved tank mix options see www.engeniatankmix.com.

DT Soybean Restrictions

- **DO NOT** apply **Engenia** to non-dicamba-tolerant soybean varieties other than as directed or severe soybean injury will occur; refer to **Soybean** section in **Crop-specific Information** section.
- **DO NOT** apply **Engenia** to soybeans after first bloom (R1).
- Use caution when tank mixing **Engenia** with approved emulsifiable concentrates (EC) or oil-based products that may increase the potential for crop injury.
- Allow at least 7 days between final application and harvest or feeding of soybean forage.
- Allow at least 14 days between final application and harvest or feeding of soybean hay.

Crop-specific Information—Conventional (non-Dicamba-tolerant) Crops

This section provides use directions for **Engenia**[®] herbicide in conventional (non-DT) crops. Read product information, application instructions, weeds controlled, and additive instructions in preceding sections of the label.

Depending on specific crop application directions, **Engenia** may be applied for postemergence control of emerged broadleaf weeds and/or residual control of germinating broadleaf weed seeds before crop planting (preplant and/or preseed) and after planting (preemergence, postemergence). Refer to **Table 1** for list of weeds controlled or suppressed.

Asparagus

Engenia may be applied immediately after cutting asparagus but at least 24 hours before the next cutting. Apply 6.4 to 12.8 fl ozs/A of **Engenia** in 40 to 60 gallons of diluted spray to emerged and actively growing weeds. Apply 12.8 fl ozs/A of **Engenia** to control common chickweed, field bindweed, nettleleaf goosefoot, and wild radish. To improve control of Canada thistle and field bindweed, apply **Engenia** in combination with glyphosate (e.g. **Roundup**[®] herbicide) or sequentially with 2,4-D.

If spray contacts emerged spears, crooking (twisting) of some spears may result. If crooking occurs, discard affected spears.

Asparagus Restrictions

- **DO NOT** apply more than a total of 12.8 fl ozs/A of **Engenia** (0.5 pound dicamba ae/A) per year in asparagus.
- **DO NOT** harvest for 24 hours after treatment.
- **DO NOT** use in the Coachella Valley of California.

Between Crop Application

Engenia may be used as a burndown treatment to control broadleaf weeds at any time of the year during the fallow period following crop harvest and before the following crop is planted. Apply **Engenia** as a broadcast or spot treatment to emerged and actively growing weeds after crop harvest (postharvest) and before a killing frost, or in fallow cropland or crop stubble the following spring or summer.

Application Rates and Timings

Apply **Engenia** as a broadcast or spot treatment at 3.2 to 12.8 fl ozs/A plus specified adjuvants; see **Tank Mixing Information** section for details. Refer to **Table 2** to determine use rates for specific targeted weed species. For best performance, apply **Engenia** when annual weeds are less than 4-inches tall, when biennial weeds are in the rosette stage, and to perennial weed regrowth in late summer or fall following a mowing or tillage treatment. For the most effective control of upright perennial broadleaf weeds such as Canada thistle and Jerusalem artichoke, apply **Engenia** when the majority of weeds have at least 4 inches of

regrowth, or for weeds such as field bindweed and hedge bindweed that are in or beyond the full bloom stage.

Avoid disturbing treated areas following application. Treatments may not kill weeds that develop from seed or underground plant parts, such as rhizomes or bulblets, after the effective period for **Engenia**. For seedling control, a follow-up program or other cultural practices should be instituted. For small grain in-crop uses of **Engenia**, refer to **Small Grain** section for details.

Specific crop rotation intervals must be observed between an application of **Engenia** and planting the following crop; see **Crop Rotation Restrictions** in **Use Restrictions** section.

Use with Other Herbicides

Broad-spectrum burndown control of grass weeds and/or additional broadleaf weeds requires another herbicide.

Engenia may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Distinct**[®] herbicide
- **Facet**[®] L herbicide
- **Outlook**[®] herbicide
- **Sharpen**[®] powered by **Kixor**[®] herbicide
- **Verdict**[®] powered by **Kixor**[®] herbicide
- 2,4-D
- glyphosate (e.g. **Roundup**)

For approved tank mix options see www.engeniatankmix.com.

Between Crop Application Restrictions

- **DO NOT** apply more than 12.8 fl ozs/A (0.5 pound dicamba ae/A) in a single application of **Engenia** as a between crop application.
- **DO NOT** apply more than a maximum cumulative total of 2 pounds dicamba ae/A from all product sources per cropping season.

Conservation Reserve Program (CRP)

Engenia may be used on both newly seeded and established grasses grown in the Conservation Reserve or federal Set-Aside Programs. Treatment with **Engenia** will injure or may kill alfalfa, clovers, lespedeza, wild winter peas, vetch, and other legumes.

Application Rates and Timings

Engenia may be applied at 3.2 to 12.8 fl ozs/A; refer to **Table 2** for rates based on target weed type and growth stage.

Newly Seeded Areas

Engenia may be applied either preplant or postemergence to newly seeded grasses or small grain such as barley, oats, rye, sudangrass, wheat, or other grain species grown

Crop-specific Information – Conventional (non-Dicamba-tolerant) Crops *(continued)*

as a cover crop. Postemergence application may be made after seedling grasses exceed the 3-leaf stage.

Preplant Intervals. Preplant applications at 12.8 fl ozs/A may injure new seedlings if the interval between application and grass planting is less than:

- 20 days - 30 inches or more annual precipitation
- 45 days - less than 30-inches annual precipitation

Established Grass Stands

Established grass stands are perennial grasses planted one or more seasons before treatment. Certain species (bentgrass, buffalograss, carpetgrass, St. Augustinegrass, or smooth brome) may show a response when treated with **Engenia® herbicide**.

Use with Other Herbicides

Broad-spectrum control of broadleaf and grass weeds requires another herbicide. **Engenia** may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Facet® L herbicide**
- atrazine
- glyphosate (e.g. **Roundup® herbicide**)
- paraquat (e.g. **Gramoxone® SL herbicide**)

For approved tank mix options see www.engeniatankmix.com.

CRP Restrictions

- **DO NOT** apply more than 12.8 fl ozs/A of **Engenia** per application.
- **DO NOT** apply more than a maximum cumulative total of 51.2 fl ozs/A of **Engenia** (2 lbs dicamba ae/A) per season.

- **Engenia** may injure newly seeded grasses and certain species, such as bentgrass, buffalograss, carpetgrass, St. Augustinegrass, or smooth brome.

Corn (field, seed, silage) and Popcorn

Engenia may be applied preplant surface, preemergence, or postemergence to corn. Corn in this label refers to conventional or herbicide-tolerant field corn (grown for grain, seed, or silage) and popcorn. Before applying **Engenia** to seed corn or popcorn, verify with your local seed company (supplier) the selectivity of **Engenia** on your inbred line or hybrid to help avoid potential injury to sensitive inbreds or hybrids.

Engenia is not registered for use on sweet corn.

Direct contact of **Engenia** with corn seed must be avoided. If corn seeds are less than 1.5 inches below the soil surface, delay application until corn has emerged.

Postemergence applications of **Engenia** to corn during periods of rapid growth may result in temporary leaning. Corn will usually become erect within 3 to 7 days. To avoid breakage, delay cultivation until after corn is growing normally.

Application Rate

Engenia application rates vary by soil texture, organic matter, and application timing. Refer to **Table 4** for **Engenia** application rates by application timing. Up to 2 applications of **Engenia** may be made during a growing season. Sequential applications must be separated by 2 weeks or more.

Table 4. Engenia Application Rates for Corn

Soil Texture	Organic Matter	Application Rate (fl ozs/A)			
		Preplant/ Preemergence ²	Preemergence	Postemergence	
		No Tillage	Conventional/ Reduced Tillage	Early ³	Late ⁴
Coarse ¹	All	6.4	NA	6.4	6.4
Medium/Fine	2.5% or less	6.4	NA	12.8	6.4
Medium/Fine	more than 2.5%	12.8	12.8	12.8	6.4

¹ Coarse soil types include sand, loamy sand, or sandy loam.

² Use only preemergence applications in conventional and reduced tillage systems.

³ Apply between corn emergence and the 5-leaf stage or 8-inches tall, whichever comes first. Use crop oil concentrate only in dry conditions when corn is less than 5-inches tall and when applying **Engenia** alone or tank mixed with atrazine.

⁴ Apply in corn that is 8-inches to 36-inches tall or up to 15 days before tassel emergence, whichever comes first.

NA - not applicable

Application Timing

Preplant (up to 14 days before planting) and Preemergence Applications in No Tillage Corn

Engenia® herbicide can be applied to emerged weeds before, during, or after planting a corn crop. When planting into a legume sod (e.g. alfalfa or clover), apply **Engenia** after 4 inches of regrowth. For application rates, refer to **Table 4**.

Preemergence Applications in Conventional or Reduced Tillage Corn

Engenia may be applied after planting and before corn emergence; refer to **Table 4** for application rates. Preemergence application of **Engenia** does not require mechanical incorporation to become active. A shallow mechanical incorporation is recommended if the application is not followed by adequate rainfall or sprinkler irrigation. Avoid tillage equipment (e.g. drags, harrows) that concentrates treated soil over seed furrow or seed damage could result.

Postemergence Applications (all tillage systems)

Apply early postemergence treatment between corn emergence and the 5-leaf stage or 8-inches tall, whichever comes first. Apply later applications when corn is 8-inches to 36-inches tall, or up to 15 days before tassel emergence, whichever comes first. Apply as a directed spray when corn leaves prevent proper spray coverage. Application rates vary by application timing; refer to **Table 4** for specific postemergence application rates.

Use with Other Herbicides

Engenia may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Armezon® herbicide**
- **Armezon® PRO herbicide**
- **Outlook® herbicide**
- **Prowl® H2O herbicide**
- **Sharpen® powered by Kixor® herbicide**
- **Verdict® powered by Kixor® herbicide**
- **Zidua® herbicide**
- atrazine
- glyphosate (e.g. **Roundup® herbicide**)

For approved tank mix options see www.EngeniaTankMix.com.

NOTE: Refer to tank mix product labels to confirm the respective tank mix products are registered for use on specific corn types. Not all corn products are registered on popcorn and seed corn.

Corn and Popcorn Restrictions

- **DO NOT** apply more than 12.8 fl ozs/A (0.5 pound dicamba ae/A) in a single application of **Engenia**.
- **DO NOT** apply more than a maximum cumulative total of 1.5 pounds dicamba ae/A from all product sources per cropping season.
- Corn or popcorn forage and silage may be harvested, fed, or grazed when the crop has reached the ensilage (milk) stage or later in maturity.
- **Engenia is not registered for use on sweet corn.**

Cotton

Before planting cotton, **Engenia** may be used early preplant for burndown of actively growing broadleaf weeds; refer to **Table 1** for weeds controlled or suppressed.

Application Rates and Timings

Apply **Engenia** as a broadcast spray up to 6.4 fl ozs/A plus specified adjuvants; refer to **Tank Mixing Information** section for details. For best performance, apply **Engenia** when weeds are less than 4 inches in height and rosettes are less than 2-inches across.

Following application of **Engenia**, wait until an accumulation of 1 inch of rainfall or irrigation followed by an interval of 21 days per 6.4 fl ozs/A or less before planting cotton. This interval must be observed before planting cotton or severe crop injury may occur.

Missouri and Tennessee Only. Following application of **Engenia**, wait until an accumulation of 1 inch of rainfall or irrigation followed by an interval of **14 days** per 6.4 fl ozs/A or less before planting cotton. This interval must be observed before planting cotton or severe crop injury may occur.

Use with Other Herbicides

Broad-spectrum postemergence control of grass weeds or additional broadleaf weeds requires another herbicide such as glyphosate. **Engenia** may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Sharpen**
- glyphosate (e.g. **Roundup**)

For approved tank mix options see www.EngeniaTankMix.com.

Cotton Restrictions

- **DO NOT** apply more than 6.4 fl ozs/A (0.25 pound dicamba ae/A) of **Engenia**[®] herbicide per year (single growing season).
- **DO NOT** apply preplant to cotton west of Interstate 25.
- **DO NOT** make **Engenia** preplant application to cotton in geographic areas with average annual rainfall less than 25 inches.
- **DO NOT** apply more than 2 pounds dicamba acid equivalent per acre for the combination of treatments if applying a spring preplant treatment following application of a fall preplant (postharvest) treatment.
- Cotton gin byproducts may be fed to livestock.

Grass Grown for Seed

Engenia may be used to control annual and perennial broadleaf weeds after weed emergence. For best performance, apply **Engenia** when weeds are less than 4 inches in height and rosettes are less than 2-inches across. Apply **Engenia** at 6.4 to 12.8 fl ozs/A plus specified adjuvants to seedling grasses after the crop reaches 3-leaf to 5-leaf stage; see **Tank Mixing Information** section for details. Apply up to 12.8 fl ozs/A of **Engenia** on well-established perennial grasses. Use the higher rate of the listed rate range when treating more mature weeds or dense vegetative growth.

Use with Other Herbicides

Engenia may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Facet**[®] L herbicide
- **Prowl**[®] H2O herbicide

For approved tank mix options see www.engeniatankmix.com.

Grass Grown for Seed Restrictions

- **DO NOT** apply **Engenia** after grass seed crop begins to joint.
- **DO NOT** apply more than 12.8 fl ozs/A of **Engenia** (0.5 lb dicamba ae/A) per application or a cumulative total of 51.2 fl ozs/A of **Engenia** (2 lbs dicamba ae/A) per season.
- Refer to **Table 5** for grazing restrictions.

Pasture, Hay, Rangeland, and Farmstead (noncropland)

Engenia may be used on pasture, hay, rangeland, and farmstead including fencerows and nonirrigation ditch-banks for control or suppression of broadleaf weed and woody brush and vine species listed in **Table 1**. **Engenia** uses described in this section also refer to small grain grown for forage pasture use (rye, sorghum, sudangrass, or wheat). Grazing and harvest intervals are shown in **Table 5**.

Engenia may also be applied to noncropland areas to control broadleaf weeds in noxious weed control programs, districts, or areas including broadcast or spot treatment of roadsides, highways, utilities, railroad, and pipeline rights-of-way. Noxious weeds must be recognized at the state level, but programs may be administered at state, county, or other level.

Application Rates and Timings

Refer to **Table 2** for rate selection based on targeted weed or brush species. Some weed species will require a tank mix partner for adequate control. Retreatments may be applied as needed.

For approved tank mix options see www.engeniatankmix.com.

DO NOT apply more than 25.6 fl ozs/A of **Engenia** during a growing season.

DO NOT apply more than 12.8 fl ozs/A of **Engenia** during a growing season on small grain grown for pasture and newly seeded areas.

Established grass crops growing under stress can exhibit various injury symptoms that may be more pronounced if herbicides are applied. Bentgrass, buffalograss, carpetgrass, and St. Augustinegrass may show a response. Usually, colonial bentgrasses are more tolerant than creeping types. Velvetgrasses are most easily injured. Treatments will injure or kill alfalfa, clovers, lespedeza, wild winter peas, vetch, and other legumes.

Spray volume may range from 10 to 600 gallons per acre. The volume of spray applied depends on the height, density, and type of weeds or brush being treated and on the type of equipment used. **Engenia** may be applied as a spot treatment to individual clumps or small areas of undesirable vegetation using a handgun or similar type of application equipment. Apply diluted sprays to allow complete wetting (up to runoff) of foliage and stems.

Table 5. Grazing and Haying Restrictions for Lactating Dairy Animals after Engenia® herbicide Treatment

Engenia Rate (fl ozs/A)	Days before Grazing	Days before Hay Harvest
Up to 12.8	7	37

Cut-surface Treatment

Engenia may be applied as a cut-surface treatment for control of unwanted trees and prevention of sprouts of cut trees. Mix 1 part **Engenia** with 1 to 3 parts water to create the application solution. Use the lower dilution rate when treating difficult-to-control species.

- **Frill or Girdle Treatment** - Using an axe to girdle tree trunk, make a continuous cut or a series of overlapping cuts. Spray or paint the cut surface with the solution.
- **Stump Treatment** - Spray or paint freshly cut surface with the water mix. Thoroughly wet the area adjacent to the bark.

Dormant Multiflora Rose Applications

Engenia can be applied as an undiluted spot treatment directly to the soil or as a Lo-Oil basal bark treatment using an oil-in-water emulsion solution when plants are dormant.

Spot Treatment Applications

Spot treatment application of **Engenia** should be applied directly to the soil as close as possible to the root crown within 6 inches to 8 inches of the crown. On sloping terrain, apply **Engenia** to the uphill side of the crown. **DO NOT** apply when snow or water prevents applying **Engenia** directly to the soil. The use rate of **Engenia** depends on the canopy diameter of the multiflora rose.

Example Engenia use rates:

- 0.25 fl oz per 5-foot canopy diameter
- 1.0 fl oz per 10-foot canopy diameter
- 2.35 fl ozs per 15-foot canopy diameter

Lo-Oil Basal Bark Treatment

For Lo-Oil basal bark treatments, apply **Engenia** to the basal stem region from the ground line to a height of 12 inches to 18 inches. Spray until runoff, with special emphasis on covering the root crown. For best results, apply **Engenia** when plants are dormant.

- **DO NOT** apply after bud break or when plants are showing signs of active growth.
- **DO NOT** apply when snow or water prevents applying **Engenia** to the ground line.

Lo-Oil Spray Solution Preparation

1. Combine 1.5 gallons of water, 1 oz of emulsifier, 12.8 fl ozs of **Engenia**, and 2.5 pints of No. 2 diesel fuel.

2. Adjust the amounts of materials used proportionately to the amount of final spray solution desired.

DO NOT apply more than 8 gallons/A of Lo-Oil spray solution mix per year.

Use with Other Herbicides

Broad-spectrum control of broadleaf and grass weeds requires another herbicide. **Engenia** may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Frequency® herbicide**

For approved tank mix options see www.engeniatankmix.com.

Pasture, Hay, Rangeland, and Farmstead (noncropland) Restrictions

- **DO NOT** apply more than a maximum cumulative total of 25.6 fl ozs/A of **Engenia** (1 lb dicamba ae/A) during a growing season.
- **DO NOT** apply more than a maximum cumulative total of 12.8 fl ozs/A of **Engenia** (0.5 lb dicamba ae/A) to small grain grown for pasture and to newly seeded areas.

Proso Millet

For use only within Colorado, Nebraska, North Dakota, South Dakota, and Wyoming

Apply **Engenia** and 2,4-D sequentially to provide control or suppression of annual broadleaf weeds; see **Table 1**.

Apply 3.2 fl ozs/A of **Engenia** with 0.375 lb acid equivalent of 2,4-D per acre. Apply as a broadcast or spot treatment to emerged and actively growing weeds and when proso millet is in the 2-leaf to 5-leaf stage. Use directions for 2,4-D products vary with manufacturers; refer to a 2,4-D product with labeling consistent with the crop-stage timing for **Engenia**. Some types of proso millet may be affected adversely by a sequential application of **Engenia** and 2,4-D.

Proso Millet Restrictions

- **DO NOT** apply unless possible proso millet crop injury will be acceptable.
- **DO NOT** apply more than 3.2 fl ozs/A of **Engenia** (0.125 lb dicamba ae/A) per season in proso millet.
- Refer to **Table 5** for grazing restrictions.

Small Grain (barley, oats, triticale, and wheat)

Engenia may be applied before, during, or after planting small grain (barley, oats, triticale, and wheat). Refer to **Application Rates and Timings** for specific small grain

Crop-specific Information – Conventional (non-Dicamba-tolerant) Crops *(continued)*

crop uses. For best performance, apply **Engenia**[®] herbicide when weeds are less than 4 inches in height and rosettes are less than 2-inches across. Applying **Engenia** to small grain during periods of rapid growth may result in crop leaning; this condition is temporary and will not reduce crop yield.

Restrictions for small grain areas grazed or cut for hay are indicated in **Table 5** in **Pasture, Hay, Rangeland, and Farmstead (noncropland)** section of this label.

Application Rates and Timings

Early Season Applications

Table 6. Early Season Application Rate and Growth Stage in Small Grain¹

Crop	Fall-seeded		Spring-seeded	
	Rate (fl ozs/A)	Growth Stage	Rate (fl ozs/A)	Growth Stage (up to)
Barley ^{2, 3}	1.6 to 3.2	before joint	1.6 to 2.4	4-leaf
Oats ³			1.6 to 3.2	5-leaf
Triticale			1.6 to 3.2	6-leaf
Wheat ⁴			1.6 to 3.2	6-leaf

¹ An adjuvant system should be used with all **Engenia** applications; refer to **Tank Mixing Information** section for details. **DO NOT** use oil concentrates for postemergence in-crop application.

² For spring barley varieties seeded during winter months or later, follow the rate and timing given for spring-seeded barley.

³ **DO NOT** tank mix **Engenia** with 2,4-D in oats or early season application on spring-seeded barley.

⁴ Early developing wheat varieties must receive application between early tillering and the joint stage; ensure that the application occurs before the jointing stage.

Fall-seeded Wheat ONLY

Western Oregon. When applied in the spring, **Engenia** may be used at rates up to 4.8 fl ozs/A on fall-seeded wheat. Periods of extended stress such as cold and wet weather may enhance the possibility of crop injury.

Colorado, Kansas, New Mexico, Oklahoma, and Texas. For suppression of perennial weeds (such as field bindweed), up to 6.4 fl ozs/A of **Engenia** may be applied on fall-seeded wheat after wheat exceeds the 3-leaf stage. Application may be made in the fall following a frost but before a killing freeze. **Engenia** at 6.4 fl ozs/A may be sequentially applied with MCPA after wheat begins to tiller. Periods of extended stress such as cold and wet weather may enhance the possibility of crop injury. For fall applications only, **DO NOT** apply **Engenia** if the potential for crop injury is unacceptable.

Preharvest Applications

To control broadleaf weeds that interfere with harvest, **Engenia** may be applied before harvest when barley or wheat is in the hard dough stage and the green color is

gone from the nodes (joints) of the stem. Best results will be obtained if the application can be made when weeds are actively growing but before weeds canopy.

Engenia applications may be made to fall-planted and spring-planted barley and wheat at 6.4 fl ozs/A as a broadcast application or spot treatment. A preharvest interval (PHI) of 7 days is required before crop harvest.

Use with Other Herbicides

Broad-spectrum control of broadleaf and grass weeds requires another herbicide. **Engenia** may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Beyond**[®] herbicide (for **Clearfield**[®] wheat and **Clearfield Plus** wheat only)
- **Clearmax**[®] herbicide (for **Clearfield** wheat and **Clearfield Plus** wheat only)
- **Sharpen**[®] powered by **Kixor**[®] herbicide
- **Zidua**[®] herbicide
- 2,4-D amine
- MCPA
- sulfonylurea-based herbicide (e.g. **Ally**[®] herbicide, **Express**[®] herbicide, **Finesse**[®] herbicide)

For approved tank mix options see www.engeniatankmix.com.

Small Grain Restrictions

- **Maximum use rate per application**
 - 3.2 fl ozs/A: Oats and triticale
 - 6.4 fl ozs/A: Spring-seeded barley, fall-seeded barley, wheat
- **Maximum seasonal use rate**
 - 3.2 fl ozs/A: Oats and triticale
 - 8.8 fl ozs/A: Spring-seeded barley
 - 9.6 fl ozs/A: Fall-seeded barley
 - 12.8 fl ozs/A: Wheat
- **DO NOT** apply **Engenia** preharvest to oats or triticale.
- **DO NOT** use oil concentrate for postemergence in-crop application.
- **DO NOT** use preharvest-treated barley or wheat for seed unless a germination test with an acceptable result of 95% germination or more is performed on the seed.
- **DO NOT** graze small grain (barley, oats, triticale, wheat) within 7 days after treatment.
- **DO NOT** harvest for hay within 37 days after treatment.
- Barley and wheat may be harvested 7 days or more after a preharvest application.
- **DO NOT** make preharvest application in California.

Sorghum

Engenia® herbicide may be used early preplant, postemergence, and preharvest in sorghum to control many annual broadleaf weeds and to reduce competition from established perennial broadleaf weeds.

Application Rates and Timings

Preplant Applications

(at least 14 days before planting)

A preplant application of **Engenia** up to 6.4 fl ozs/A may be applied at least 14 days before sorghum planting.

Postemergence Applications

Up to 6.4 fl ozs/A of **Engenia** plus specified adjuvants (refer to **Tank Mixing Information** section for details) may be applied after sorghum is in the spike stage (all sorghum emerged) but before sorghum is 15-inches tall. For best performance, apply **Engenia** when sorghum crop is in the 3-leaf to 5-leaf stage and weeds are small (less than 3-inches tall). Use drop nozzles if sorghum is taller than 8 inches. Keep spray off sorghum leaves and out of the whorl to reduce the likelihood of crop injury and to improve spray coverage of weed foliage.

Applying **Engenia** to sorghum during periods of rapid growth may result in temporary leaning of plants or rolling of leaves. These effects are usually outgrown within 10 to 14 days.

Preharvest Applications

Oklahoma and Texas ONLY

Up to 6.4 fl ozs/A of **Engenia** may be applied for weed suppression any time after sorghum has reached the soft-dough stage. An agriculturally approved surfactant may be used to improve performance; see **Tank Mixing Information** section for details. Delay harvest until 30 days after a preharvest treatment.

Split Applications

Engenia may be applied in split applications: preplant followed by postemergence or preharvest; or postemergence followed by preharvest. **DO NOT** apply more than 6.4 fl ozs/A of **Engenia** per application, or a maximum cumulative total of 12.8 fl ozs/A of **Engenia** per year.

Use with Other Herbicides

Engenia may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Basagran® 5L herbicide**
- **Facet® L herbicide**
- **Outlook® herbicide** - (Preplant only)
- **Sharpen® powered by Kixor® herbicide**
- **Verdict® powered by Kixor® herbicide**
- atrazine
- glyphosate (e.g. **Roundup® herbicide**)

For approved tank mix options see www.engeniatankmix.com.

Sorghum Restrictions

- **DO NOT** graze or feed treated sorghum forage or silage before mature grain stage. If sorghum is grown for pasture or hay, refer to **Pasture, Hay, Rangeland, and Farmstead (noncropland)** section for specific grazing and feeding restrictions.
- **DO NOT** apply **Engenia** to sorghum grown for seed production.
- **DO NOT** apply more than 6.4 fl ozs/A of **Engenia** (0.25 lb dicamba ae/A) per application.
- **DO NOT** apply more than a maximum cumulative total of 12.8 fl ozs/A of **Engenia** (0.5 lb dicamba ae/A) per season.
- **Oklahoma and Texas only** - Delay harvest until 30 days after a preharvest treatment.

Soybean

Engenia may be used preplant or preharvest in soybean to control many annual broadleaf weeds and to reduce competition from established biennial and perennial broadleaf weeds.

Application Rates and Timings

Preplant Applications

(at least 14 days before planting)

Apply **Engenia** as a broadcast spray at 3.2 to 12.8 fl ozs/A plus specified adjuvants; refer to **Tank Mixing Information** section for details.

Preplant Intervals. Following application of **Engenia** and a minimum accumulation of 1 inch of rainfall or overhead irrigation, preplant waiting intervals are required before planting soybeans or crop injury may occur:

- **14 days** for 3.2 to 6.4 fl ozs/A
- **28 days** for 6.5 to 12.8 fl ozs/A

Preharvest Applications

Apply **Engenia** as a broadcast spray or spot spray at 6.4 to 12.8 fl ozs/A plus specified adjuvants; refer to **Tank Mixing Information** section for details. Applications should be made to emerged and actively growing weeds after soybean pods have reached mature brown color and at least 75% leaf drop has occurred.

Treatments may not kill weeds that later develop from seed or underground parts, such as rhizomes or bulblets, after the effective residual period for **Engenia**. For seedling control, a follow-up program or other cultural practices should be instituted.

Use with Other Herbicides

Engenia® herbicide may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Optill® powered by Kixor® herbicide**
- **Outlook® herbicide**
- **Prowl® H2O herbicide**
- **Pursuit® herbicide**
- **Raptor® herbicide**
- **Sharpen® powered by Kixor® herbicide**
- **Verdict® powered by Kixor® herbicide**
- **Zidua® herbicide**
- **Zidua® PRO powered by Kixor® herbicide**
- glyphosate (e.g. **Roundup® herbicide**)

For approved tank mix options see www.engeniatankmix.com.

Soybean Restrictions

- **DO NOT** apply more than 12.8 fl ozs/A of **Engenia** (0.5 lb dicamba ae/A) in a spring application before soybean planting.
- **DO NOT** make **Engenia** preplant application to soybeans in geographic areas with average annual rainfall less than 25 inches.
- **DO NOT** apply more than 51.2 fl ozs/A of **Engenia** (2 lbs dicamba ae/A) per year (single growing season).
- **DO NOT** use preharvest-treated soybean for seed unless a germination test with an acceptable result of 95% germination or better is performed on the seed.
- **DO NOT** harvest soybeans until 7 days after a preharvest application.
- **DO NOT** feed soybean fodder or hay following preharvest application of **Engenia**.
- **DO NOT** make preharvest applications in California.

Sugarcane

Engenia may be used any time after weed emergence but before the close-in stage of sugarcane to control many annual and perennial broadleaf weeds; see **Table 1** for weeds controlled or suppressed.

Apply 6.4 to 12.8 fl ozs/A of **Engenia** for control of annual weeds and 12.8 fl ozs/A for control or suppression of biennial and perennial weeds. Use the higher rate of the specified rate range when treating dense vegetative growth. Repeat treatment may be made as needed; however, **DO NOT** apply more than the annual maximum cumulative total of 51.2 fl ozs/A of **Engenia** (2 lbs dicamba ae/A).

When possible, direct the spray beneath the sugarcane canopy to minimize the likelihood of crop injury. Using directed sprays will also help maximize the spray coverage of weed foliage.

Use with Other Herbicides

Engenia may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Prowl H2O**
- atrazine

For approved tank mix options see www.engeniatankmix.com.

Sugarcane Restrictions

- **DO NOT** apply more than 12.8 fl ozs/A of **Engenia** (1 lb dicamba ae/A) in a single application.
- **DO NOT** apply more than a maximum cumulative total of 51.2 fl ozs/A of **Engenia** (2 lbs dicamba ae/A) per growing season.
- **DO NOT** harvest sugarcane until 87 days after application.

Farmstead Turf (noncropland) and Sod Farms

Engenia may be used in farmstead turf (noncropland) and sod farms to control or suppress growth of many annual, biennial, and some perennial broadleaf weeds; see **Table 1** for weeds controlled or suppressed. **Engenia** will also suppress woody brush and vine species; refer to **Table 2** for application rates based on targeted weed or woody brush and vine species and growth stage. Some weed species will require tank mixes for optimum control.

Repeat treatment may be made as needed; however, **DO NOT** apply more than 25.6 fl ozs/A of **Engenia** (1 lb dicamba ae/A) per growing season.

Apply 30 to 200 gallons of diluted spray per acre (3 to 17 quarts of water per 1000 sq ft), depending on density or height of weeds treated and on type of equipment used.

To avoid injury to newly seeded grasses, delay application of **Engenia** until after the second mowing. Established grass crops growing under stress can exhibit various injury symptoms that may be more pronounced if herbicides are applied. Bentgrass, buffalograss, carpetgrass, and St. Augustinegrass may show a response.

Use with Other Herbicides

Engenia® herbicide at 3.2 to 12.8 fl ozs/A may be applied sequentially with one or more of, but not limited to, the following herbicide products:

- **Drive® XLR8 herbicide**
- **Pendulum® herbicide**
- **Tower® herbicide**
- 2,4-D
- MCPA
- MCPP

For approved tank mix options see

www.engeniatankmix.com.

Farmstead Turf and Sod Farm Restrictions

- **DO NOT** use on residential sites.
- **DO NOT** apply more than 25.6 fl ozs/A of **Engenia** (1 lb dicamba ae/A) per growing season.
- **Areas where Roots of Sensitive Plants Extend**
 - **DO NOT** apply more than 3.2 fl ozs/A of **Engenia** (0.125 lb dicamba ae/A) on coarse-texture soils (sand, loamy sand, or sandy loam).
 - **DO NOT** apply more than 6.4 fl ozs/A of **Engenia** on fine-texture soils.
 - **DO NOT** make repeat applications in these areas for 30 days and until previous applications of **Engenia** have been activated in the soil by rainfall or irrigation.

Conditions of Sale and Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, it is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of BASF CORPORATION ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

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ARKANSAS COURT OF APPEALS
DIVISION III
No. CV-16-739

FARM CREDIT MIDSOUTH, PCA
APPELLANT/CROSS-APPELLEE

Opinion Delivered: April 4, 2018

V.

APPEAL FROM THE CRITTENDEN
COUNTY CIRCUIT COURT
[NO. 18CV-09-414]

FRED BOLLINGER, JR.; BOLLINGER
LONE OAK, INC.; AND BOLLINGER
PARTNERS, INC.

APPELLEES/CROSS-APPELLANTS

HONORABLE PAMELA HONEYCUTT,
JUDGE

AFFIRMED IN PART AND REVERSED
IN PART ON DIRECT APPEAL;
AFFIRMED ON CROSS-APPEAL

BART F. VIRDEN, Judge

Farm Credit Midsouth, PCA, appeals from a Crittenden County jury's verdict in favor of appellees Fred Bollinger Jr., individually, and his related farming entities Bollinger Lone Oak, Inc., and Bollinger Partners, Inc. (collectively, the Bollingers). The Bollingers cross-appeal from the circuit court's decisions granting summary judgment or directed verdicts in favor of Farm Credit on certain of the Bollingers' claims. We affirm in part and reverse in part on direct appeal; we affirm on cross-appeal.

I. Background

Beginning in 2003, Farm Credit made a series of operating and equipment loans to the Bollingers' farming operations. The loans were secured by various security agreements

and mortgages granting Farm Credit liens in the Bollingers' crops, government payments, crop insurance, equipment, and real estate. The Bollingers had a disastrous 2007 crop season when a late-April freeze damaged their wheat crop. Later, a severe drought reduced their soybean yield. Because of these weather impacts, the Bollingers, who had booked their crops with Riceland Foods, were unable to produce enough grain to fulfill their contracts with Riceland. This caused a default on the Farm Credit loans.

After the Bollingers defaulted, Farm Credit filed a foreclosure and replevin action in 2009 for judgment on the notes and foreclosure of the collateral.¹

The Bollingers answered, raising affirmative defenses. They also filed a counterclaim, asserting three basic claims: (1) that Farm Credit improperly required the Bollingers to book their crops as a condition of receiving loans; (2) that Farm Credit disclaimed any interest in the proceeds of the Bollingers' 2008 soybean crop only later to renege on its disclaimer and wrongfully assert a lien on those proceeds; and (3) that Farm Credit mishandled the Bollingers' crop-insurance applications and claims.² The Bollingers also sought punitive damages and a jury trial on all issues triable by jury.

¹Farm Credit originally named Fred Bollinger, Sr.; his wife, Syble Bollinger; and Fred Bollinger, Jr.'s wife, Betty Bollinger as defendants. Syble Bollinger died during the pendency of this action in the lower court and Fred Bollinger, Sr., was appointed personal representative. Also, Betty Bollinger filed for bankruptcy protection during the pendency of the case. Farm Credit was granted summary judgment on the counterclaim filed by Betty Bollinger.

²As explained below, there were multiple theories for each claim.

The circuit court granted partial summary judgment in favor of Farm Credit on the Bollingers' claim for punitive damages. Farm Credit also moved for summary judgment on its complaint, which the circuit court granted as to liability but withheld entry of a final summary judgement until after trial of the Bollingers' counterclaim when the value of all of the claims could be determined.

The case was submitted to a jury over several days. The circuit court directed verdicts in favor of Farm Credit on certain claims. The jury found in favor of the Bollingers on all three of their claims, based on multiple theories on each claim. In entering judgment on the jury's verdict, the court found that the Bollingers were entitled to only one recovery on each of their claims. Thus, Fred Bollinger, Jr., was awarded a total of \$564,564.35; Bollinger Lone Oak, Inc., a total of \$534,314.42; and Bollinger Partners, Inc., a total of \$389,108.15

Farm Credit filed a timely motion for judgment notwithstanding the verdict (JNOV) or, alternatively, for new trial, which was denied after a hearing. The Bollingers also filed a posttrial motion seeking prejudgment interest on their claims for Farm Credit's asserting a lien on their 2008 soybean crop. At the conclusion of a telephone hearing, the court granted the motion and awarded the Bollingers a total of \$173,867.45. This appeal and cross-appeal timely followed.

II. *Finality*

Before addressing the merits of the appeal and cross-appeal, we must first address an issue of finality. The issue is that there was no express resolution of Farm Credit's complaint for foreclosure.

As mentioned above, the circuit court granted summary judgment in favor of Farm Credit on its foreclosure complaint. However, the court withheld entry of a judgment in favor of Farm Credit until after trial of the Bollingers' counterclaim. The court said that it intended to issue a judgment once the amounts of the various claims were determined. Between the entry of the summary-judgment order as to liability and trial, however, Fred Bollinger, Jr., and Fred Bollinger, Sr., sold their interests in Bollinger Brothers, Inc., and paid off the principal and interest owing on loans made to Bollinger Lone Oak, Inc., and Bollinger Partners, Inc., secured by mortgages on land owned by Bollinger Brothers, Inc. Farm Credit subsequently released the mortgages securing the loans. Obviously, by having the loans paid and the mortgages released, there was no further need for action on Farm Credit's complaint. Both parties acknowledge that no order was ever entered finally adjudicating Farm Credit's complaint.

Generally, this lack of an order disposing of Farm Credit's complaint would render the judgment entered on the Bollingers' counterclaim nonfinal. *See Bevans v. Deutsche Bank Nat'l Tr. Co.*, 373 Ark. 105, 281 S.W.3d 740 (2008). However, Farm Credit's notice of appeal contains a statement that it abandoned all pending but unresolved claims. This abandonment operates as a dismissal with prejudice effective on the date that the otherwise final judgment appealed from was entered. Ark. R. App. P.-Civ. 3(e)(vi). We hold that the

statement in the notice of appeal was sufficient to render the judgment entered on the jury's verdict final and appealable even though there was no express final adjudication of Farm Credit's complaint. Ark. R. App. P.-Civ. 3; *Bradshaw v. Fort Smith Sch. Dist.*, 2017 Ark. App. 196, at 4, 519 S.W.3d 344, 347.

III. *Arguments on Appeal*

We depart from our usual practice of addressing the points of error in the order raised by the parties and address the points topically, including arguments on both direct appeal and cross-appeal. This is done in an attempt to make it easier on the reader of this opinion.

On appeal, Farm Credit argues that (1) it is entitled to a new trial because the Bollingers received a double recovery; (2) there is no substantial evidence to support the jury's verdict on tortious interference; (3) there is no substantial evidence to support the jury's verdict on deceit as to the 2008 soybean crop; (4) there is no substantial evidence to support the verdict for promissory estoppel; (5) there is no substantial evidence to support the claims for negligence and breach of fiduciary duty arising out of the 2008 soybean crop; (6) there is no substantial evidence to support the jury's verdict of promissory estoppel on crop insurance; (7) it is entitled to a new trial because the circuit court erred by allowing the jury to decide the Bollingers' counterclaim; and (8) the court erred in granting prejudgment interest.

On cross appeal, the Bollingers argue that the circuit court erred in granting Farm Credit directed verdicts on their claims for (1) negligence in the booking claim; (2) breach

of fiduciary duty in the booking claim; (3) reduced yields; (4) and unplanted crops; and in granting Farm Credit summary judgment on their booking-penalties claim.

IV. *Standard of Review*

Both parties challenge the circuit court's rulings on motions for directed verdicts. A circuit court evaluates a motion for directed verdict by deciding whether the evidence is sufficient for the case to be submitted to the jury; that is, whether the case constitutes a prima facie case for relief. *Gamble v. Wagner*, 2014 Ark. App. 442, 440 S.W.3d 352. In making that determination, the circuit court does not weigh the evidence; rather, it is to view the evidence in the light most favorable to the party against whom the verdict is sought and give it its highest probative value, taking into account all reasonable inferences deducible from it. *Id.* If any substantial evidence exists that tends to establish an issue in favor of that party, then a jury question is presented. *Id.* Substantial evidence goes beyond suspicion or conjecture and is sufficient to compel a conclusion one way or the other. *Id.*

V. *Discussion*

A. The Booking Claim

The Bollingers' first claim is their "booking" claim. Although Farm Credit denied it, the Bollingers claimed that as a requirement of receiving their 2007 crop loans, Farm Credit forced the Bollingers to "book" their crops. "Booking" means that the Bollingers entered into contracts to set the amount and price of the crops in advance of their planting, with Riceland Foods or some other buyer. In other words, they would sell in advance of planting a predetermined amount of grain at a predetermined price. The

Bollingers argued that Farm Credit, by requiring them to book their crops, interfered with their right to market their crops however they pleased and to whomever they pleased at the time of harvest. They also argued that this introduced an unacceptable level of uncertainty and risk into their operations. In late 2006, the Bollingers booked both their 2007 and 2008 crops.

The Bollingers pursued their booking claim under theories of negligence, breach of fiduciary duty, and tortious interference with contractual relations or business expectancies. The circuit court directed verdicts in favor of Farm Credit on the negligence and breach-of-fiduciary-duty theories. The jury found in favor of the Bollingers on their tortious interference claim and awarded the Bollingers \$987,417. Farm Credit argues that the circuit court should have granted a directed verdict on this cause of action.

Our supreme court recently set out the elements of the cause of action as follows:

The elements of tortious interference are (1) the existence of a valid contractual relationship or a business expectancy; (2) knowledge of the relationship or expectancy on the part of the interfering party; (3) intentional interference inducing or causing a breach or termination of the relationship or expectancy; and (4) resultant damage to the party whose relationship or expectancy has been disrupted. A fifth requirement has been added by this court: the conduct of the defendant must be “improper.” In addition to the above, another essential element of a tortious-interference-with-contractual-relations claim is that there must be some third party involved.

Ballard Grp., Inc. v. BP Lubricants USA, Inc., 2014 Ark. 276, at 14–15, 436 S.W.3d 445, 454 (citations omitted). Furthermore, the expectancy that is obstructed must be precise, and it must be sufficiently concrete in order to qualify as a business expectancy and survive summary dismissal. See *Skalla v. Canepari*, 2013 Ark. 415, 430 S.W.3d 72.

The chief distinction between a cause of action for interference with a contractual relationship and a cause of action for interference with a business expectancy lies in whether there is a present contractual relationship or whether there is merely some prospective relationship that is interfered with. See, e.g., *Stewart Title Guar. Co. v. Am. Abstract & Title Co.*, 363 Ark. 530, 215 S.W.3d 596 (2005); Restatement (Second) of Torts § 766B cmt. a (1979). Our supreme court has noted that tortious interference with an existing contract needs “greater protection,” whereas tortious interference with a business expectancy needs only “some protection.” *Mason v. Funderburk*, 247 Ark. 521, 526–27, 446 S.W.2d. 543, 547 (1969). There is a greater recognition of privilege as a defense in the case of interference with business expectations. *Walt Bennett Ford, Inc. v. Pulaski Cty. Special Sch. Dist.*, 274 Ark. 208, 214–B, 624 S.W.2d 426, 429–30 (1981) (citing W. Prosser, *The Law of Torts*, § 130 (4th ed. 1971)).

The first element of the tort may be proved by demonstrating *either* a valid contractual relationship *or* a business expectancy. *Cross v. Ark. Livestock & Poultry Comm’n*, 328 Ark. 255, 262, 943 S.W.2d 230, 234 (1997). The Bollingers do not allege that they had an existing contract with Riceland; instead, they argue that they had a preexisting relationship with Riceland and sold their crops to Riceland as harvested each year. The business relationships protected by this tort include *any* prospective contractual relations if the potential contract would be of pecuniary value. *Stewart Title*, 363 Ark. at 542–43, 215 S.W.3d at 603. The protected relationships also include a “continuing business or other customary relationship” which is non-contractual. *Stewart Title*, 363 Ark. at 543, 215

S.W.3d at 603 (quoting Restatement (Second) of Torts § 766B, cmt. c (1979)). This includes potential opportunities to sell or buy, and options. *Id.* Here, the Bollingers would enter into contracts with Riceland as each crop season progressed. As the Bollingers argued to the circuit court in response to Farm Credit’s motion for directed verdict on this claim, the expectancy was that the Bollingers would control the marketing and selling of their crops without interference. The question of whether a valid business expectancy existed was a question for the jury to determine. *Stewart Title, supra*. It is clear from the jury’s verdict that they found such an expectancy. Accordingly, we conclude that the Bollingers had a valid expectancy entitled to protection. As such, there was no requirement that there be a third party involved. *Ballard Grp., Inc. v. BP Lubricants USA, Inc., supra; Faulkner v. Ark. Children’s Hosp.*, 347 Ark. 941, 961, 69 S.W.3d 393, 406 (2002).

The next necessary element of the cause of action for tortious interference requires that the relationship be terminated or breached. See *Navorro-Monzo v. Hughes*, 297 Ark. 444, 447, 763 S.W.2d 635, 636 (1989).³ After the Bollingers “booked” their crops, their relationship with Riceland continued, albeit on somewhat different terms than before. Therefore, we conclude there was a failure to prove a termination of breach of the relationship.

This brings us to the next question, if Farm Credit required the Bollingers to “book” their crops as a condition for the further extension of credit, did such requirement amount to an *improper* interference with the Bollingers’ business expectancy.

³*Navorro-Monzo* involved an existing contractual relationship between the parties.

Impropriety is determined by (1) the nature of the actor's conduct, (2) the actor's motive, (3) the interests of the other with which the actor's conduct interferes, (4) the interests sought to be advanced by the actor, (5) the social interests in protecting the freedom of the action of the actor and the contractual interests of the other, and (6) the proximity or remoteness of the actor's conduct to the interference and the relations between the parties. *Hamby v. Health Mgmt. Assocs., Inc.*, 2015 Ark. App. 298, at 3, 462 S.W.3d 346, 349-50. The actor's conduct is to be considered in light of what is fair and reasonable under the circumstances. *Id.* The determination of whether the interference is improper is ordinarily left to the jury. *Id.*

What is missing from the Bollingers' argument is any discussion of the factual support for the jury's finding that Farm Credit's actions were improper. Indeed, in their summary of the elements of the cause of action, the Bollingers omit any discussion of impropriety, and they argue only that the verdict should be upheld because the jury was instructed on the seven factors set out above. The only evidence supporting impropriety was the testimony of Mack Adams, a former Farm Credit loan officer who handled the Bollingers' account, that requiring the Bollingers to "book" their crops would be a violation of Farm Credit's policy. However, that is not enough to support the jury's verdict because a Farm Credit policy is not independently enforceable. It was not contained in any of the contracts or loan documents between the Bollingers and Farm Credit. Again, what is missing is a discussion of the *evidence* to support the jury's verdict on this point. If the

interference is not improper, the tort has not occurred, even if the victim is harmed. See *Mason v. Wal-Mart Stores, Inc.*, 333 Ark. 3, 969 S.W.2d 160 (1998).

Arkansas law recognizes justification as a defense to a claim of tortious interference. See *Walt Bennett Ford, Inc.*, *supra*. Farm Credit denies that it conditioned the extension of credit on the Bollingers “booking” their 2007 crops. Assuming, as we must in light of the jury’s verdict, that Farm Credit did impose such a requirement, that does not make it “improper” as would support a verdict for tortious interference. Farm Credit had its own valid, economic interest to protect. Protecting one’s economic interest constitutes justification for interference with a business expectancy unless one employs improper means to protect that interest. See *Kinco, Inc. v. Schueck Steel, Inc.*, 283 Ark. 72, 78, 671 S.W.2d 178, 181–82 (1984) (quoting Restatement (Second) of Torts § 768 (1977)). So long as a defendant does not employ improper means, a defendant’s own economic interest provides sufficient justification for an alleged tortious interference. *West Memphis Adolescent Residential, LLC v. Compton*, 2010 Ark. App. 450, 374 S.W.3d 922.

Also under this claim, the Bollingers argue that the circuit court erred in granting a directed verdict in favor of Farm Credit on their claim of negligence arising out of Farm Credit’s requirement that they book their 2007 and 2008 crops. However, the Bollingers’ assertion on this point is made without a developed argument and without a convincing explanation as to how or why a legal error occurred. It is the appellant’s burden to demonstrate reversible error. *Parker v. Parker*, 97 Ark. App. 298, 248 S.W.3d 523 (2007).

Points asserted without citation to authority or convincing argument should not be considered. *Id.*

The Bollingers next argue that the circuit court erred in directing a verdict for Farm Credit on their breach-of-fiduciary-duty claim arising from the requirement that they “book” their crops. We disagree.

Ordinarily, the relationship between a bank and its customer is one of debtor and creditor. *Mans v. Peoples Bank*, 340 Ark. 518, 10 S.W.3d 885 (2000). For a fiduciary relationship to exist, our supreme court has emphasized the necessity of factual underpinnings to establish a relationship of trust between a bank and its customers. *Id.* at 526, 10 S.W.3d at 889. In their amended counterclaim, the Bollingers assert that the fiduciary relationship between them and Farm Credit resulted from Farm Credit being their lender over a period of years. A customer asserting a fiduciary relationship with his bank has the burden of proving the relationship is beyond that of debtor-creditor. *Marsh v. Nat’l Bank of Commerce*, 37 Ark. App. 41, 822 S.W.2d 404 (1992).

The Bollingers have not shown anything more than an ordinary debtor-creditor relationship between them and Farm Credit. The mere fact that there is a long-term relationship, without more, is insufficient to establish a fiduciary relationship. *Mans, supra.* There has been no showing that Farm Credit has been “intimately involved” with the Bollingers’ operations so as to elevate the relationship to a “special relationship” for which fiduciary duties are owed. Thus, the circuit court correctly directed a verdict on this count of the Bollingers’ counterclaim.

Because the Bollingers failed to prove two of the elements of the cause of action for tortious interference—that there was a termination or breach of their relationship with Riceland and that Farm Credit used improper means to achieve that result—the circuit court erred when it failed to grant Farm Credit’s motion for a directed verdict on this claim.

B. The 2008 Soybean Crop

For the 2008 crop season, Farm Credit loaned the Bollingers only enough money for their wheat crop and for their land rent for the entire crop year cycle. The loans did not include moneys for their soybean crop. In fact, Farm Credit took the position that it would look at the situation again in June or July to determine whether to extend credit for the soybean crop. The Bollingers sought financing for its 2008 soybean crop from another agricultural lender, Home Oil Company, and its lending arm, AgQuest (collectively, Home Oil). Fred Bollinger, Jr., testified that he obtained a \$100,000 line of credit from Home Oil in October 2007. He further testified that in an effort to obtain alternative financing, he asked Farm Credit to write a letter to Home Oil, stating that Farm Credit was not claiming a lien or security interest in the Bollingers’ 2008 soybean crop. The letter, dated February 14, 2008, states in pertinent part:

This letter is to notify Home Oil Company that Farm Credit Midsouth, ACA [sic], has no security interest or crop lien against the 2008 soybean crop for all entities related to Fred Bollinger, Jr. (including Fred Bollinger Jr., Individually, Bollinger Lone Oak, Inc., Bollinger Partners, Inc., or FNB Farms).

Home Oil eventually loaned the Bollingers \$300,000 in July 2008. However, Fred Bollinger, Jr., testified that the loan was not related to the February 2008 letter. The loan was not secured by a lien on the soybean crop. Instead, the loan was guaranteed by William Tennison. Farm Credit later asserted a lien on the soybean crop, and Riceland made the proceeds, approximately \$411,000, jointly payable to Farm Credit and the Bollingers. The Bollingers endorsed the proceeds over to Farm Credit, who applied them to the balance of the Bollingers' notes and loans.

The Bollingers' claim for recovery of the 2008 soybean proceeds fails on multiple bases. First, the Bollingers are getting a double recovery. The Bollingers received approximately \$411,000 for their 2008 soybean crop. Farm Credit applied those proceeds to reduce the balance due on the Bollingers' loans. Thus, they have received the benefit of those proceeds when Farm Credit applied those same proceeds to reduce the loan balance. For the Bollingers to then recover a judgment for those same proceeds amounts to a prohibited double recovery. *Fisher Trucking, Inc. v. Fleet Lease, Inc.*, 304 Ark. 451, 803 S.W.2d 888 (1991).

Second, the Bollingers' promissory-estoppel and deceit claims also fail because the promise—made in the February 2008 letter—induced no reliance or action by anyone. Home Oil did not assert its own lien on the proceeds of the crop. The law on promissory estoppel is set out in the Restatement (Second) of Contracts:

A promise which the promisor should reasonably expect to induce action or forbearance on the part of the promisee or a third person and which does induce such action or forbearance is binding if injustice can be avoided only by

enforcement of the promise. The remedy granted for breach may be limited as justice requires.

Restatement (Second) of Contracts §90 (1981); *see also* *K.C. Props. of N.W. Ark., Inc. v. Lowell Inv. Partners, LLC*, 373 Ark. 14, 280 S.W.3d 1 (2008); *Rigsby v. Rigsby*, 356 Ark. 311, 149 S.W.3d 318 (2004).

As noted above, Fred Bollinger, Jr., testified that the July 2008 loan from Home Oil was not related to Farm Credit's February 2008 letter to Home Oil. Likewise, a claim of fraud or deceit also includes a reliance element. *Tyson Foods, Inc. v. Davis*, 347 Ark. 566, 66 S.W.3d 568 (2002).

Because the claim fails, we also reverse the circuit court's award of prejudgment interest to the Bollingers arising from this claim.

C. The Crop-Insurance Claims

Farm Credit also argues that there is no substantial evidence to support the jury's verdicts for negligence, breach of fiduciary duty, and promissory estoppel concerning the Bollingers' crop-insurance claims. The Bollingers contend that Farm Credit mishandled their claim so that they did not recover all of the proceeds they were due.

One of the Bollingers' claims centered on Farm 2311. For the 2007 crop year, the Bollingers reported to Charlene Zachary of Farm Credit that they had planted fifteen acres on Farm 2311. Zachary, in turn, relayed this information to the insurance company, Rain and Hail. Rain and Hail then issued a summary of coverage to both Farm Credit and the Bollingers. The 2007 summary of coverage, however, listed Farm 2311 as having only eight

planted acres. The Bollingers did not notice or object to the acreage reduction. In obtaining their 2008 crop insurance, the Bollingers reported their 2007 production to Zachary, who relayed the information to Rain and Hail. The Bollingers reported their production for Farm 2311 as 534.14 bushels, which, when divided by eight acres rather than fifteen acres, resulted in an abnormally high yield of 67 bushels per acre. Fred Bollinger, Jr., testified that when he received a letter from Rain and Hail inquiring about possible excessive yields and requesting documentation, he spoke with Zachary and she said that she would handle it. He asked that she look at the documentation to determine the acreage he reported because he did not report eight acres for Farm 2311. Instead, he reported fifteen acres. Zachary testified that the Bollingers had correctly reported that they had planted fifteen acres. She said that she did not call Rain and Hail to discuss the discrepancy when she received the letter questioning the excessive yield. She said that Mr. Bollinger had told her that he had taken care of the situation. Zachary said that Rain and Hail probably resolved the issue by combining the Bollingers' separate farms into basic units. She also said that the Bollingers had paid to have their farms insured separately instead of having them combined into basic units.

Farm Credit argues that it did not owe any duty to the Bollingers and cites the common-law rule that a policyholder has a duty to educate himself concerning matters of insurance, including the coverage available under different policies, and that an insurance agent generally has no duty to advise or inform policyholders as to different coverages. *Buelow v. Madlock*, 90 Ark. App. 466, 206 S.W.3d 890 (2005) (citing *Scott-Huff Ins. Agency v.*

Sandusky, 318 Ark. 613, 887 S.W.2d 516 (1994); *Howell v. Bullock*, 297 Ark. 552, 764 S.W.2d 422 (1989); *Stokes v. Harrell*, 289 Ark. 179, 711 S.W.2d 755 (1986)). However, if a special relationship exists between the insured and his insurance agent, this may place on the agent a higher duty to inform the insured. *Id.* The existence of a special relationship presents a question of fact. *Id.*

Based on these principles, Farm Credit argues that the promissory-estoppel claim cannot stand because it owed no duty to the Bollingers to advise about coverages. However, these claims are not about coverages per se; instead, they concern whether Farm Credit was negligent in helping the Bollingers in resolving the excessive-yield matter with Rain and Hail. Although Farm Credit may not have owed the Bollingers a duty, the jury may have found that it had assumed a duty when Charlene Zachary told Fred Bollinger, Jr., that she would handle it. A party who gratuitously undertakes a duty can be liable for negligently performing that duty. *Mercy Health Sys. of Nw. Ark. v. McGraw*, 2013 Ark. App. 459, 429 S.W.3d 298. In that case, a hospital doctor, upon being served with a summons and complaint in a malpractice action, entrusted it to employees of the hospital who assured her that it would be answered. However, when no answer was timely filed, a default judgment for \$500,000 was entered against the doctor. The doctor's subsequent promissory-estoppel claim against the hospital for failing to keep its specific promise "to take care of the complaint" was tried to a jury, which awarded the doctor \$350,000 after the verdict was reduced by the doctor's fault. We affirmed and held that the hospital employees' promise to the doctor to "take care of" the malpractice complaint was specific

enough to be relied on by the doctor as an element of her promissory-estoppel claim against the hospital.

Here, the evidence was such that the issue of whether Zachary said that she would handle the excessive-yield matter and, if so, whether she was negligent in doing so, presented a jury question.

D. Other Issues

There are some loose ends on both direct appeal and on cross-appeal that do not fit into the discussion of the other issues. They are discussed here.

First, Farm Credit concedes that in light of the supreme court's recent decision abolishing the clean-up doctrine in *Tilley v. Malvern National Bank*, 2017 Ark. 343, 532 S.W.3d 570, the circuit court did not err in submitting the Bollingers' counterclaim to a jury.

Next, the Bollingers argue that the circuit court erred in directing a verdict for Farm Credit on their claim for reduced crop yields for their 2008 crop. Farm Credit moved for a directed verdict on this claim on the basis that the Bollingers did not provide proper evidence of their damages. In its motion, Farm Credit asserted that the Bollingers simply provided county-wide figures for average yield per acre for the prior years without comparison of the yield for the damaged field and the yield for an adjacent, undamaged field growing the same crop during the same season. There was discussion between the court and counsel for the Bollingers over the proper measure of damages. Counsel for the Bollingers indicated that he had used county-wide average yields. The court denied the

motion at the conclusion of the Bollingers' case-in-chief but indicated that it was likely to grant the motion at the conclusion of all of the evidence. There was further discussion of the measure of damages and the Bollingers' proof at the close of all of the evidence. This discussion included both the reduced-yield claim and the claim for the acreage not planted. The court eventually granted the motion as to both claims.

Arkansas law provides that when a crop is damaged but nonetheless grows to maturity, the damages are the difference between the market value, at the time of harvest, of the crop actually produced and the crop that would have been produced without the damage, less the costs of production. *McGraw v. Weeks*, 326 Ark. 285, 930 S.W.2d 365 (1996); *McCorkle Farms, Inc. v. Thompson*, 79 Ark. App. 150, 84 S.W.3d 884 (2002). Evidence as to the average yield per acre for the prior years is not reliable in computing damages in light of weather conditions and other factors that vary annually. *McCorkle Farms*, 79 Ark. App. at 164, 84 S.W.3d at 892 (citing *J.L. Wilson Farms, Inc. v. Wallace*, 267 Ark. 643, 590 S.W.2d 42 (Ark. App. 1979)). However, "a comparison between the yield from the damaged land and the yield from adjacent but undamaged land during the same season, for the same crop, [is] substantial evidence to support an award of damages." *Id.*

The Bollingers contend that they submitted proof regarding the proper measure of damages through the testimony of Fred Bollinger, Jr., and an exhibit he prepared. In his testimony, Bollinger gave an average yield for his total acreage farmed at the booked price of \$8.85 per acre. He also testified as to the cost of production. He did not attempt to break the figures down as to how many acres had reduced yields as opposed to yields for

his undamaged lands. Nor is there any evidence as to yields from adjacent, undamaged farms and how their yields compared to the Bollingers' yields. Without the showing of comparability, the circuit court properly granted the motion for directed verdict on this claim. *McCorkle Farms, supra*.

The Bollingers also invite this court to adopt a measure of damages allowing recovery based on evidence of prior years' yields. This we cannot do. We are without authority to overrule our supreme court's precedent. *See, e.g., Selrahc Ltd. P'ship v. Seeco Inc.*, 2009 Ark. App. 865, 374 S.W.3d 33; *Roark v. State*, 46 Ark. App. 49, 876 S.W.2d 596 (1994); *Leach v. State*, 38 Ark. App. 117, 831 S.W.2d 615 (1992).

Another element of damages the Bollingers sought to recover was the value of their unplanted 2008 soybean crop. The circuit court granted a directed a verdict on this claim as part of a discussion that also included the Bollingers' reduced-yield claim. The circuit court and the parties agreed that the correct measure of damages was the fair rental value of the land. *Gregory v. Walker*, 239 Ark. 415, 389 S.W.2d 892 (1965); *Farm Bureau Lumber Corp. v. McMillan*, 211 Ark. 951, 203 S.W.2d 398 (1947); *St. Louis, Iron Mtn. & S. Ry. v. Saunders*, 85 Ark. 111, 107 S.W. 194 (1908).

The Bollingers contend that they submitted proof regarding the rental value of the relevant land. We disagree. Fred Bollinger, Jr., testified that his loan from Farm Credit included enough money to cover the rental of the land. The Bollingers also cite part of the Bollingers' 2008 credit presentation prepared by Farm Credit, as setting forth the relevant rental figures. However, no such rental information appears in that document. Instead,

that document breaks down the Bollingers' already-incurred costs per acre, as well as how much additional money per acre will be necessary to "make" or "finish" their *wheat* crop. There was no loan for the *soybean* crop at that time, and the document notes that Farm Credit would reevaluate in June or July for funding of the soybean crop. Therefore, the circuit court did not err in granting a directed verdict on this claim.

Finally, the Bollingers argue that the circuit court erred in granting summary judgment in favor of Farm Credit on the Bollingers' claim for booking penalties imposed but never collected or sued for by Riceland.

This issue arose as follows. By "booking" their 2007 crops, the Bollingers obligated themselves to sell certain quantities of grain to Riceland at a future date but then were unable to deliver those quantities of grain within the timeframe required. As a result, the Bollingers alleged that they incurred booking penalties in excess of \$300,000.

Farm Credit filed a motion for partial summary judgment on this claim, arguing that because the statute of limitations had run without Riceland having collected the booking penalties, they were not a proper element of the Bollingers' damages. The motion also sought to exclude evidence of the penalties from the jury. In their response to the motion, the Bollingers admitted that Riceland had not filed suit to collect the penalties. In their supporting brief, they also argued that excluding evidence of the penalties violated the collateral-source rule. After a hearing, the circuit court granted the motion for summary judgment.

The burden of proving damages rests on the party claiming them. *Minerva Enters., Inc. v. Howlett*, 308 Ark. 291, 824 S.W.2d 377 (1992.) The Bollingers argue that Farm Credit never presented proof in support of its motion for partial summary judgment. However, there is no such requirement. Rule 56 does not require the moving party to present affidavits. Instead, it expressly dispenses with that requirement, stating that “a party seeking to recover upon a claim, counterclaim, or cross-claim or to obtain a declaratory judgment” and “[a] party against whom a claim, counterclaim, or cross-claim is asserted or a declaratory judgment is sought” may move for summary judgment “*with or without supporting affidavits.*” Ark. R. Civ. P. 56 (a), (b) (emphasis added). In any event, Farm Credit *did* provide proof to support its motion by citing the deposition testimony of Fred Bollinger, Jr., to the effect that the penalties had not been paid and that Riceland was not going to collect them. Moreover, the Bollingers admitted that they had not paid the penalties, that Riceland never filed suit to collect the penalties, and that the statute of limitations had run. Under these circumstances, the Bollingers cannot prove one of the elements of their claim to recover the booking penalties—namely, that they suffered damages. When a party cannot present proof on an essential element of his or her claim, there is no remaining genuine issue of material fact, and the party moving for a summary judgment is entitled to judgment as a matter of law. *First United Methodist Church of Ozark v. Harness Roofing, Inc.*, 2015 Ark. App. 611, 474 S.W.3d 892. Therefore, the circuit court correctly granted summary judgment in favor of Farm Credit on the Bollingers’ claim for the booking penalties.

VI. Conclusion

In conclusion, we affirm the circuit court's decision to have the Bollingers' counterclaim presented to a jury because the clean-up doctrine has been abolished. We also affirm the jury's verdict on Farm Credit's handling of the Bollingers' crop-insurance claims. Because the Bollingers failed to make a prima facie case of tortious interference, we reverse the jury's verdict and dismiss that claim. We likewise reverse and dismiss the Bollingers' claim for the proceeds from their 2008 soybean crop. The judgments in the Bollingers' favor for deceit and promissory estoppel cannot stand because there was no reliance on Farm Credit's February 2008 letter to Home Oil Company. We also affirm on all points of the Bollingers' cross-appeal.

Affirmed in part and reversed in part on direct appeal; affirmed on cross-appeal.

GLADWIN and VAUGHT, JJ., agree.

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Pesticide Law: A Summary of the Statutes

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CRS Report for Congress

Prepared for Members and Committees of Congress

Summary

This report summarizes the major statutory authorities governing pesticide regulation: the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and Section 408 of the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended, as well as the major regulatory programs for pesticides. Text relevant to FIFRA is excerpted, with minor modifications, from the corresponding chapter of CRS Report RL30798, *Environmental Laws: Summaries of Major Statutes Administered by the Environmental Protection Agency*, coordinated by David M. Bearden, which summarizes more than a dozen environmental statutes.

Congress enacted the original version of FIFRA in 1947, but a revision in 1972 is the basis of current pesticide policy. Substantial changes were made in 1988, with a focus on the reregistration of older pesticides, and again in the 1996 Food Quality Protection Act (FQPA), which also amended the FFDCA. The Pesticide Registration Improvement Act of 2003 (PRIA 1), the Pesticide Registration Improvement Renewal Act of 2007 (PRIA 2), and the Pesticide Registration Improvement Extension Act of 2012 (PRIA 3; P.L. 112-177), enacted September 28, 2012, amended FIFRA to revise EPA authorities for collecting and expending fees imposed on pesticide manufacturers and formulators. These fees are used to supplement annual appropriations so as to expedite EPA processing of applications for pesticide registration and reregistration.

Congress first required limits on pesticide residues on raw food in 1954 amendments to the FFDCA. Limits were required for food additives (including pesticide residues in processed foods) in the 1958 FFDCA amendments. In the 1996 FFDCA amendments, Congress established a new standard of safety for pesticide residues in food (both raw and processed): maximum residue levels set by EPA must ensure with “a reasonable certainty” that “no harm” will result from pesticide exposure. The FQPA directed EPA to coordinate tolerance setting with pesticide registration under FIFRA for food-use registrations of pesticides.

FIFRA requires the U.S. Environmental Protection Agency (EPA) to regulate the sale and use of pesticides in the United States through registration and labeling of pesticide products. The sale of any pesticide is prohibited in the United States unless it is registered and labeled. EPA is directed to restrict the use of pesticides as necessary to prevent unreasonable adverse effects on people and the environment, taking into account the costs and benefits of various pesticide uses. Pesticides manufactured solely for export do not require registration. FIFRA also requires EPA to review registrations for pesticides periodically and to reregister older pesticides based on new data that meet current regulatory and scientific standards. For pesticides to be registered for use in food production, FFDCA Section 408 authorizes EPA to establish allowable residue levels, called “tolerances,” that ensure that human exposure to pesticide residues in food will be “safe.” Foods with pesticide residues above the tolerance, or for which there is no tolerance established, may not be imported or sold in interstate commerce. A pesticide may not be registered under FIFRA for a food use unless a tolerance for that pesticide and food has been established under FFDCA.

FIFRA directs EPA to make public any data submitted to support a registration application, if EPA registers the pesticide, but certain data are protected as trade secrets, and other registrants may not use the same data to support registration applications for similar pesticides for a period of 10 years. EPA continues to evaluate the safety of pesticides after they are registered, as new information becomes available. A pesticide registration may be canceled or amended if EPA determines that current use may cause unreasonable adverse effects.

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Introduction

The Environmental Protection Agency (EPA) is responsible for implementing federal pesticide policies under two statutes: the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA),¹ governing the sale and use of pesticide products within the United States, and the Federal Food, Drug, and Cosmetic Act (FFDCA), which limits pesticide residues on food in interstate commerce (including imports). This report defines key terms, provides a brief history of the federal pesticide laws, and describes key provisions of the laws, including the pesticide registration process and how it interfaces with food safety requirements. In addition, this report lists several references for more detailed information about the acts, and two tables cross reference sections of the *U.S. Code* with corresponding sections of the acts. The report is descriptive rather than analytic, highlights key provisions rather than providing a comprehensive inventory of s' numerous sections, and addresses authorities and limitations imposed by statute, rather than the status of EPA implementation or other policy issues. Other CRS products address current pesticide issues, including CRS Report RL32218, *Pesticide Registration and Tolerance Fees: An Overview*, by Robert Esworthy, and CRS Report RL32884, *Pesticide Use and Water Quality: Are the Laws Complementary or in Conflict?*, by Claudia Copeland.

Overview

There are an estimated 18,000 pesticide products currently in use.² These generally are regulated under FIFRA, but approximately 5,800 pesticide products used in food production also are regulated under the FFDCA, as discussed below. FIFRA requires EPA to regulate the sale and use of pesticides in the United States through registration and labeling.³ Pesticides are broadly defined in FIFRA Section 2(u) as chemicals and other products used to kill, repel, or control pests. Familiar examples include pesticides used to kill insects and weeds that can reduce the yield, and sometimes harm the quality, of agricultural crops, ornamental plants, forests, wooden structures (e.g., through termite damage), and pastures. But the broad definition of “pesticide” in FIFRA Section 2 also applies to products with less familiar “pesticidal uses.” For example, substances are pesticides when used to control mold, mildew, algae, and other nuisance growths on equipment, in surface water, or on stored grains. The term also applies to disinfectants and sterilizing agents, animal repellents, rat poison, and many other substances.

FIFRA directs EPA to restrict the use of pesticides as necessary to prevent unreasonable adverse effects on people and the environment, taking into account the costs and benefits of various pesticide uses. The act prohibits sale of any pesticide in the United States unless it is registered (licensed) and labeled to indicate approved uses and restrictions. It is a violation of the law to use a pesticide in a manner that is inconsistent with the label instructions. EPA registers each pesticide product for each approved use. For example, a product may be registered for use on green beans to control mites, as a seed treatment for cotton, and as a treatment for structural cracks. In addition, FIFRA requires EPA to reregister each older pesticide product that was first registered prior to 1984 and to review all registered pesticides (including those that have

¹ FIFRA also is known as the Act of June 25, 1947.

² Sven-Erik Kaiser, U.S. EPA, Office of Congressional and Intergovernmental Relations, personal communication, December 16, 2011.

³ Exceptions are noted in 40 CFR 152.20, 152.25, and 152.30.

completed the one-time reregistration requirement) periodically on a 15-year cycle based on new data that meet current regulatory and scientific standards. Establishments that manufacture or sell pesticide products must register with EPA. Facility managers are required to keep certain records and to allow inspections by federal or state regulatory officials.

For the 600 or more pesticides (i.e., active ingredients) registered for use in food production, the FFDCFA Section 408 authorizes EPA to establish maximum allowable residue levels (also known as “tolerances”) to ensure that human exposure to the pesticide ingredients in food and animal feed will be “safe.”⁴ A “safe” tolerance is defined in the law as a level at which there is “a reasonable certainty of no harm” from the exposure, even when considering total cumulative and aggregate pesticide exposure of children. Under FFDCFA, foods with a residue of a pesticide ingredient for which there is no tolerance established, or with a residue level exceeding an established tolerance limit, are declared “unsafe” and “adulterated”; such foods cannot be sold in interstate commerce or imported to the United States. Pesticides may not be registered under FIFRA for use on food unless tolerances (or exemptions) have been established under the FFDCFA.

FIFRA authorizes EPA to fund registration-related activities (including registration reviews and tolerance assessments) by collecting fees from pesticide registrants (i.e., manufacturers and formulators) to supplement appropriations.

History of Federal Pesticide Law

Table 1 and **Table 2** summarize the history of FIFRA and FFDCFA, respectively.

FIFRA

Federal pesticide legislation was first enacted in 1910; it authorized the U.S. Department of Agriculture (USDA) to set standards for the manufacture of insecticides and fungicides and to require them to be labeled. USDA then could inspect and remove from the market products that were “adulterated”⁵ or ineffective. The original 1947 version of FIFRA broadened the scope of pesticide law to include more types of pesticides, required product registration by USDA prior to interstate or international shipment, and required that labels carry adequate warnings and precautionary instructions for use.

The 1970s brought major changes to the federal role in regulating pesticide production and use. Responsibility for administering FIFRA was shifted to EPA when that agency was created in 1970. A complete revision of FIFRA in 1972 was precipitated by congressional concerns about long- and short-term toxic effects of pesticide exposure on people who applied pesticides (applicators), wildlife, insects and birds not targeted by the pesticide product, and on food

⁴ Ingredients in pesticide products are categorized as active or inert. Active ingredients are those that are intended to control the pest, while inert ingredients, now generally known as “other ingredients,” are used to deliver the active ingredients effectively to the pest. Other ingredients often are solvents or surfactants and often comprise the bulk of the pesticide product. Some inerts are known to be toxic, some are known to be harmless, and others have unknown toxicity.

⁵ FIFRA 2(c) defines “adulterated” in terms of quality, that is, the purity and strength of the product relative to the standards established for that product.

consumers. The 1972 law replaced the original 1947 law, and is the basis of current federal policy, which is summarized in this report. FIFRA, as amended in 1972,⁶ directed EPA to register pesticide products and to “reregister” older products in order to assess their safety in light of more demanding and current scientific standards.

Substantial changes to FIFRA also were made in 1978 (P.L. 95-396), 1988 (P.L. 100-532), 1996 (P.L. 104-170), 2004 (P.L. 108-199), and 2007 (P.L. 110-94). Concerns about the pace of pesticide reregistration were addressed in 1978 when Congress streamlined the process.⁷ The 1978 FIFRA amendments required EPA to review groupings of products having the same active ingredients, on a generic instead of individual product basis, and made provisions for registrants to share the cost of data generation. In addition, Congress authorized EPA to suspend registrations of products if registrants did not provide required test data in a timely fashion. The 1988 amendments focused on further accelerating reregistration (including tolerance assessment) by focusing on older pesticides (registered before 1984), authorizing additional registration fees, and establishing the Reregistration and Expedited Processing Fund in the U.S. Treasury to receive the fee payments (FIFRA Section 4(k)). Congress amended FIFRA Section 4 to require agricultural chemical producers to pay a one-time reregistration fee for each active ingredient and product registrants (manufacturers and formulators) to pay an annual registration maintenance fee for each product registration. The Reregistration and Expedited Processing Fund was intended to supplement appropriations to offset the cost of reregistration and tolerance reassessment.

The Food Quality Protection Act of 1996 (FQPA) established a new, more stringent safety standard for pesticide residues on food, required special protection for children, directed EPA to reassess pesticides posing the greatest risks first, facilitated registration of pesticides for special (so-called “minor”) uses, mandated a periodic review of all registered pesticides at least once every 15 years, and required coordination of regulations implementing FIFRA and FFDCA. The FQPA also authorized and reauthorized collection of new and existing fees to support reregistration and tolerance reassessments through FY2001. Exemptions from, or reductions in, fees were allowed for minor-use pesticides, public health pesticides, and small business registrants.

Current Fees Related to Pesticide Registration

Registration service fees: FIFRA Section 33 [7 U.S.C. 136w-8]

Annual maintenance fees: FIFRA Section 4(i)(5) [7 U.S.C. 136a-1(i)(5)]

Congress extended authority for fees annually through appropriations legislation after FY2001, until the omnibus appropriations legislation signed January 23, 2004 (P.L. 108-199), modified the types and amounts of fees that EPA could collect through FY2008. That legislation included the Pesticide Registration Improvement Act (PRIA 1), which amended FIFRA Section 4 to reauthorize collection of annual “maintenance” fees to support reregistration and tolerance reassessment activities and designated a portion of those fees for the review of inert ingredients. Maintenance fees are deposited in the “Reregistration and Expedited Processing Fund” in the

⁶ Federal Environmental Pesticide Control Act of 1972, P.L. 92-516, Section 4(c)(2).

⁷ Federal Pesticide Act of 1978, P.L. 95-396.

U.S. Treasury (initially established in 1988⁸). PRIA 1 extended the deadline for completion of reregistration. In addition, PRIA 1 added a new Section 33 to FIFRA to establish a system of “Registration Service Fees” (also known as “Enhanced Registration Service” fees) to expedite specific pesticide registration applications submitted to EPA, and established a new fund in the U.S. Treasury to receive those fees, the Pesticide Registration Fund (FIFRA Section 33(c)). PRIA 1 prohibited collection of fees other than maintenance and the new registration fees. The Pesticide Registration Improvement Renewal Act of 2007, or PRIA 2, reauthorized and revised these fee provisions through the end of FY2012, and the Pesticide Registration Improvement Extension Act of 2012, or PRIA 3 (P.L. 112-177), enacted September 28, 2012, further revised the fee collection provisions and extended reauthorization through the end of FY2017. Certain fee collections and apportionment are authorized under PRIA 3 on a reduced basis through FY2019.⁹

See **Table 3** for a listing of current provisions in FIFRA.

Table 1. Federal Insecticide, Fungicide, and Rodenticide Act and Amendments
(codified generally as 7 U.S.C. 136-136y)

Year	Act	Public Law Number
1947	Federal Insecticide, Fungicide, and Rodenticide Act	P.L. 80-104
1964	Federal Insecticide, Fungicide, and Rodenticide Act Amendments	P.L. 88-305
1972	Federal Environmental Pesticide Control Act	P.L. 92-516
1975	Federal Insecticide, Fungicide, and Rodenticide Act Extension	P.L. 94-140
1978	Federal Pesticide Act of 1978	P.L. 95-396
1980	Federal Insecticide, Fungicide and Rodenticide Act Amendments	P.L. 96-539
1988	Federal Insecticide, Fungicide, and Rodenticide Amendments of 1988	P.L. 100-532
1990	Food, Agriculture, Conservation, and Trade Act of 1990	P.L. 101-624
1991	Food, Agriculture, Conservation and Trade Amendments of 1991	P.L. 102-237
1996	Food Quality Protection Act (FQPA) of 1996	P.L. 104-170
2004	Pesticide Registration Improvement Act of 2003	P.L. 108-199
2007	Pesticide Registration Improvement Renewal Act of 2007	P.L. 110-94
2012	Pesticide Registration Improvement Extension Act of 2012	P.L. 112-177

Source: Congressional Research Service.

Note: The current FIFRA statute was established by P.L. 92-516, which completely replaced (by amendment) the original 1947 legislation.

⁸ Federal Insecticide, Fungicide, and Rodenticide Act Amendments of 1988 (P.L. 100-532), enacted October 25, 1988, and retained in Section 501(b) P.L. 104-170, the Food Quality Protection Act of 1996, enacted August 3, 1996; 7 U.S.C. §136a-1(k)(1).

⁹ CRS Report RL32218, *Pesticide Registration and Tolerance Fees: An Overview*, provides a historical overview of federal authority regarding pesticide fees, including the amount of fee revenues collected over time, and summarizes the key elements of PRIA 1, the revisions reflected in PRIA 2 and in PRIA 3, and highlights of EPA’s registration and reregistration activities since the enactment of PRIA 1.

Authorization for appropriations for FIFRA expired on September 31, 1991, although appropriations bills have continued to provide funding to implement the law. Authority provided by FIFRA to EPA to issue and enforce regulations is, for the most part, permanent, and is not affected by the lack of authorization.

FFDCA

The original FFDCA of 1938 established the structure of the current law. With respect to food safety and possible contaminants, it required the Food and Drug Administration (FDA, then a part of USDA) to set tolerances for unavoidable poisonous substances in food. Congress acted to protect consumers from pesticide residues on food in 1954 by adding a new Section 408 to the FFDCA. It directed FDA to set residue tolerances for all pesticides in *raw* agricultural commodities. Congress expanded the requirement for tolerances in the Food Additives Amendment of 1958, which added Section 409, directing FDA to set tolerances for food additives, including pesticide residues in *processed* foods. Section 409 also forbade the addition to food of any additive (including pesticide residue), if it was found to be a potential cancer-causing agent. This provision is referred to as the Delaney Clause.

In 1970, authority to establish tolerances for pesticide residues was transferred to the newly formed EPA. FDA, in the Department of Health and Human Services (HHS), retained responsibility for enforcement of tolerances in food that is imported or sold across state boundaries.

In 1996, Congress substantially revised requirements for pesticide residue tolerance setting in the Food Quality Protection Act (FQPA). The FQPA redefined terms so that pesticide residues in processed foods were no longer regulated as food additives, and therefore no longer were subject to the Delaney Clause. The FQPA also established a new safety standard of a “reasonable certainty of no harm” from exposure to pesticides. (For details on the safety standard, see “Tolerance Setting” below.) See **Table 4** for a listing of current pesticide-related provisions in the FFDCA.

The Act of July 22, 1954, authorized such sums as may be necessary to carry out this FFDCA section (21 U.S.C. 346b). Fees for tolerance assessments are authorized by FFDCA Section 408(m), but PRIA 1 prohibited collection of tolerance fees in 2004. General appropriations supplemented by the Reregistration and Expedited Processing Fund and the Pesticide Registration Fund support EPA activities with respect to tolerance setting for food-use pesticides.

Table 2. Federal Food, Drug, and Cosmetic Act, Section 408, and Amendments
(codified generally as 21 USC 346a)

Year	Act	Public Law Number
1938	Federal Food, Drug, and Cosmetic Act	Act of June 25, 1938
1954	Federal Food, Drug, and Cosmetic Act Amendments	Act of July 22, 1954
1958	Food Additive Amendments of 1958 (including the Delaney Clause)	P.L. 85-929
1996	Food Quality Protection Act of 1996	P.L. 104-170

Source: Congressional Research Service.

Registration of Pesticide Products

When pesticide manufacturers apply to register a pesticide active ingredient¹⁰, pesticide product, or a new use of a registered pesticide under FIFRA Section 3, EPA requires them to submit scientific data on toxicity and behavior in the environment. EPA may require data from any combination of more than 100 different tests, depending on the potential toxicity of active and inert ingredients and degree of exposure. To register a pesticide use on food, EPA also requires applicants to identify analytical methods that can be used to test food for residues of active ingredients, certain inert ingredients, and their breakdown products and to determine the amount of residue that could remain on crops, as well as on (or in) food products, assuming that the pesticide product is applied according to the manufacturers' recommended rates and methods.

Based on the data submitted, EPA determines whether and under what conditions the proposed pesticide use would present an unreasonable risk to human health or the environment. If the pesticide is proposed for use on a food crop, EPA also determines whether a "safe" level of pesticide residue, or tolerance, can be established under the FFDCA. A tolerance must be established before a pesticide registration may be granted for use on food crops. If registration is granted, the agency specifies the approved uses and conditions of use, including safe methods of pesticide storage and disposal, which the registrant must explain on the product label. FIFRA requires that federal regulations for pesticide labels pre-empt state, local, and tribal regulations. Use of a pesticide product in a manner inconsistent with its label is prohibited.

EPA may classify and register a pesticide product for general or for restricted use. Products known as "restricted-use pesticides" are those judged to be more dangerous to the applicator or to the environment. Such pesticides can be applied only by people who have been trained and certified. Individual states and Indian tribes generally are responsible for training and certifying pesticide applicators.

FIFRA Section 3 also allows "conditional," temporary registrations if (1) the proposed pesticide ingredients and uses are substantially similar to currently registered products and will not create additional significant environmental risks; (2) an amendment is proposed for additional uses of a registered pesticide, and sufficient data are submitted indicating that there is no significant additional risk; or (3) data requirements for a new active ingredient require more time to generate than normally allowed, and use of the pesticide during the period will not cause any unreasonable adverse effect on the environment and will be in the public interest.

EPA has authority to collect fee revenues as a means of accelerating the pace of the agency's activities to meet its statutory obligations required under FIFRA and FFDCA. All Section 3 registrations are subject to a maintenance fee, collected annually from pesticide registrants (pesticide manufacturers and formulators) to continue existing registrations of their pesticides the year in which the fee is paid. In addition, Section 33 of FIFRA, "Pesticide Registration Services Fees," describes a fee system for new and certain pending applications for pesticide registrations, amended registrations, and associated tolerance actions. Fees are charged based on a statutorily prescribed schedule,¹¹ and fees received by EPA are deposited in the Pesticide Registration Fund

¹⁰ See footnote 4 for definitions of "active" and "inert" pesticide ingredients.

¹¹ The category or type of application, the amount of the pesticide registration service fee, and the corresponding decision review time frame in which the agency is to make a decision under PRIA 3 (P.L. 112-177) are prescribed in the act. Section 2(b)(1)(A) of P.L. 112-177 amends FIFRA by striking existing paragraph (3) under 7 U.S.C. §136w- (continued...)

in the Treasury of the United States, which was established by Congress under PRIA 1 (FIFRA Section 33(c)). PRIA 1 prohibited collection of additional tolerance fees authorized under FFDCA Section 408(m). Revenues from the Pesticide Registration Fund can be used for costs associated with review and decision making for applications for which registration service fees have been paid, but fees collected cover only a portion of EPA's registration activities. The remaining costs are expected to be paid from annual appropriations. To ensure that the appropriated funds are not reduced in lieu of fee revenues, PRIA 3 enacted September 28, 2012, revised and extended the prohibition on authorizing registration service fees unless the amount of congressional appropriations for specified functions conducted by the EPA Office of Pesticide Programs (OPP) (excluding any fees appropriated) remains no less than the corresponding FY2012 appropriation.¹² PRIA 1 and PRIA 2 had stipulated that appropriated funds for specific EPA OPP functions be maintained at no less than 3% below their FY2002 levels. PRIA 3 also continued to stipulate that the authorization to collect and obligate fees must be provided in advance in appropriations acts.¹³ These requirements have been met in EPA annual appropriations for FY2004 through FY2012,¹⁴ and until March 27, 2013, in the FY2013 continuing appropriations resolution (P.L. 112-175).

FIFRA-FFDCA Coordination

EPA has long coordinated pesticide registrations for food uses under FIFRA with tolerance setting under the FFDCA. The Food Quality Protection Act of 1996 (FQPA; P.L. 104-170) codified this policy. Thus, if EPA revokes a residue tolerance under FFDCA, it cancels the FIFRA pesticide registration for that food use. Similarly, if a pesticide registration for use on a food crop is canceled, EPA also cancels the residue tolerance for the food. However, just as FIFRA allows continued use of remaining pesticide stocks after a registration is canceled, FFDCA allows continued commerce in commodities legally treated with a pesticide. Thus, EPA does not immediately revoke the tolerance for the pesticide residue, when it cancels the corresponding registration.

Tolerance Setting

Any person who has registered a pesticide may petition EPA proposing establishment of a tolerance or an exemption for that pesticide to permit its use on food-related crops.¹⁵ Tolerance petitions must include information about pesticide application rates, measured concentrations of pesticide residues on the food after the pesticide has been applied according to directions on its label, and safety of pesticide use on food crops. The FFDCA requires EPA to respond to each petition by establishing a tolerance or exempting the pesticide from the requirement. If the pesticide will not leave residues above an established safe level, EPA will register the pesticide

(...continued)

8(b) and inserting new paragraph (3), "Schedule of Covered Applications and Registration Service Fees." Under PRIA 1 and PRIA 2, the EPA Administrator was directed to publish a detailed schedule of covered pesticide applications and corresponding registration service fees, as reported in the *Congressional Record*.

¹² P.L. 112-177 Section 2(b)(3)(A) through (C) amends 7 U.S.C. §136w-8(d)(2) and strikes paragraph (4).

¹³ FIFRA §33(c)(4) Collections and Appropriations (7 U.S.C. §136w-8(c)(4)(A)).

¹⁴ FY2004 (P.L. 108-199); FY2005 (P.L. 108-447); FY2006 (P.L. 109-54); FY2007 (P.L. 110-5); FY2008 (P.L. 110-161); FY2009 (P.L. 111-8); FY2010 (P.L. 111-88); FY2011 (P.L. 112-10, for EPA, §1101(a)(4) and §1104 in Title I of Division B in P.L. 112-10 provided continued authorization for the collection of pesticide fees during FY2011 pursuant to FY2010 P.L. 111-88, Division A); and FY2012 (P.L. 112-74).

¹⁵ That is, use on food crops, animal feed crops, or food products directly (e.g., grains, fruits, or vegetables after harvest).

for use on that food product and set the tolerance level by issuing a regulation. EPA tolerances for pesticide residues preempt state and local restrictions on food, if the state and local restrictions are based on lower residue levels. States may petition for an exception if the EPA-set residue level threatens public health.

The FFDCA, Section 408, as amended by the FQPA, requires EPA to assess safety in terms of total exposure to the pesticide (that is, to the concentration of pesticide allowed by the tolerance, together with all other dietary and non-food exposures for which there is reliable information) as well as to other pesticides that have the same toxic effects on people. No quantitative standard of safety is established by law, but the Committee on Commerce noted in its report on the bill that became the FQPA that EPA should continue setting standards to ensure safety as it had in the past:

the Committee expects that a tolerance will provide a ‘reasonable certainty of no harm’ if the Administrator determines that the aggregate exposure to the pesticide chemical residue will be lower by an ample margin of safety than the level at which the pesticide chemical residue will not cause or contribute to any known or anticipated harm to human health. The Committee further expects, based on discussions with the Environmental Protection Agency, that the Administrator will interpret an ample margin of safety to be a 100-fold safety factor applied to the scientifically determined ‘no observable effect’ level when data are extrapolated from animal studies.¹⁶

In determining a safe level, the FFDCA directs EPA to take into account many factors, including available information on dietary exposure to pesticides among infants and children. The FQPA strictly limited the nature and influence of benefits considered in tolerance setting under Section 408 of the FFDCA. As amended, Section 408 allows EPA to maintain or modify existing tolerances (but not to establish new tolerances) at higher than “safe” residue levels *only if* the pesticide use avoids other greater risks to consumers, or is necessary to avoid significant disruption in domestic production of an adequate, wholesome, and economical food supply. Such higher tolerance levels may be set only for pesticides that are potential carcinogens (or have some other health effect) for which there is no known level of exposure at which no harm is anticipated (known as a non-threshold effect). The higher tolerance level allowed for such pesticide residues must be “safe” for infants and children, as well as with respect to health effects for which there is a known threshold (that is, a level below which exposure is known to be harmless). The higher cancer (or other non-threshold) risk posed by the tolerance on an annual basis may not be more than 10 times the risk at a “safe” level of exposure and not more than twice the risk of a “safe” level over a lifetime.

For nonthreshold effects, the House Commerce Committee provided additional guidance for establishing a level of residue that should be considered “safe.”

In the case of a nonthreshold effect which can be assessed through quantitative risk assessment, such as a cancer effect, the Committee expects, based on its understanding of current EPA practice, that a tolerance will be considered to provide a ‘reasonable certainty of no harm’ if any increase in lifetime risk, based on quantitative risk assessment using conservative assumptions, will be no greater than ‘negligible.’ It is the Committee’s understanding that, under current EPA practice, ... EPA interprets a negligible risk to be a

¹⁶ U.S. House of Representatives, Committee on Commerce, *Food Quality Protection Act of 1996*, H.Rept. 104-669, part 2, 104th Cong., 2nd Session, 1996, p. 6.

one-in-a-million lifetime risk. The Committee expects the Administrator to continue to follow this interpretation.¹⁷

The “safe” standard applies to both raw and processed foods, and requires EPA to consider cumulative and aggregate exposure to pesticides in food, drinking water, air, and consumer products. Congress directed EPA to reevaluate all existing tolerances against this standard before August 2006.

FFDCA directs the FDA and USDA to monitor pesticide residue levels in food in interstate commerce and to enforce tolerances through their food inspection programs. USDA is responsible for inspecting meat and poultry; FDA inspects all other foods. States also may monitor pesticide residues in food sold within their jurisdictions.

Public Disclosure, Exclusive Use, and Trade Secrets

FIFRA Section 3 directs EPA to make the data submitted by the applicant for pesticide registration publicly available within 30 days after a registration is granted. However, applicants may claim certain data are protected as trade secrets under FIFRA, Section 10. If EPA agrees that the data are protected, the agency must withhold those data from the public, unless the data pertain to the health effects or environmental fate or effects of the pesticide ingredients. Information may be protected if it qualifies as a trade secret and reveals: (1) manufacturing processes; (2) details of methods for testing, detecting, or measuring amounts of inert ingredients; or (3) the identity or percentage quantity of inert ingredients.

Companies sometimes seek to register a product based upon the registration of similar products, relying upon the data provided by the original registrant that are publicly released. This is allowed. However, Section 3 of FIFRA provides for a 10-year period of “exclusive use” by the registrant of data submitted in support of an original registration or a new use. In addition, an applicant who submits any new data in support of a registration is entitled to compensation for the cost of data development by any subsequent applicant who supports an application with that data within 15 years of its submission. If compensation is not jointly agreed upon by the registrant and applicant, binding arbitration can be invoked.

Reregistration

For many years, Congress has been concerned about the tens of thousands of registered pesticide products that had not been subjected to modern safety reviews. FIFRA Section 4 directs EPA to reregister such products (if they were first registered prior to 1984), in order to assess their safety in light of current scientific standards. Many of those older pesticide products have had their registrations canceled, often because registrants did not request reregistration. At least 14,000 products are no longer in use. Nevertheless, the task for registrants and EPA of reregistering the remaining older pesticide products is immense and costly, and is ongoing.¹⁸

¹⁷ Ibid.

¹⁸ See EPA, “Product Reregistration,” as of November 2012, at <http://www.epa.gov/pesticides/reregistration/product-reregistration.htm>, and “Pesticide Reregistration Facts,” as of November 18, 2011, http://www.epa.gov/oppsrrd1/reregistration/reregistration_facts.htm, visited November 2012.

For the purpose of reregistration, EPA considers groupings of products having the same active ingredients (known as “cases”), on a generic instead of individual product basis. For each active case, the agency evaluates existing scientific data to determine whether they are sufficient to inform EPA’s decision about the ingredient’s eligibility for reregistration, given the safety standards specified by FIFRA and FFDCA. For food-use pesticides, EPA evaluates a pesticide’s eligibility for reregistration at the same time the agency reassesses the tolerance for that pesticide under the FFDCA. If data are not sufficient, the agency issues a “data call-in” to registrants, who are responsible for generating the necessary new data following EPA protocols.¹⁹ Registrants may share the cost of testing and analysis. EPA is responsible for reviewing data and determining whether it adequately demonstrates the safety of the product. When all necessary data have been received and reviewed, EPA prepares and issues a Reregistration Eligibility Decision document, known as a “RED.” If registrants do not provide required test data in a timely fashion, EPA is authorized to suspend registrations of products.

FIFRA Section 4(i) directs EPA to collect one-time reregistration fees and to deposit them into the Reregistration and Expedited Processing Fund, established under FIFRA Section 4(k). Annual maintenance fees for registered products also are deposited into this fund. These funds supplement EPA appropriations and are meant to expedite EPA processing of applications for pesticide reregistration (including tolerance reassessment) and to offset costs associated with pesticide registration review (see below). PRIA 1 directed EPA to complete REDs for pesticides (i.e., active ingredients) with food uses/tolerances by August 3, 2006, and to complete REDs for all remaining non-food use pesticides by October 3, 2008. However, the reregistration process continues after that date, as explained on the EPA reregistration website:

After EPA has issued a RED and declared a pesticide eligible for reregistration, individual end-use products that contain the pesticide active ingredient still must be reregistered. Through this concluding part of the process, known as “product reregistration,” the Agency makes sure that the risk reduction measures called for in REDs are reflected on individual pesticide product labels. In some cases, the Agency uses Memoranda of Agreement or other measures to include risk reduction measures on pesticide labels sooner, before product reregistration is completed. EPA plans to complete the last product reregistration decisions several years after the last REDs are signed.²⁰

Registration Review

In anticipation of EPA’s completion of reregistration, Congress amended FIFRA Section 3(g), mandating periodic review of all pesticide registrations on a 15-year cycle. PRIA 2 authorized use of the moneys in the Reregistration and Expedited Processing Fund (FIFRA Section 4(k)) to offset costs of these reviews. PRIA 2 established a deadline of October 1, 2022, for EPA to complete registration review decisions for all pesticide products registered as of October 1, 2007. PRIA 3 (P.L. 112-177), enacted September 28, 2012, continued the authorization of the moneys in this Fund and retained the October 1, 2022, deadline. The registration reviews are intended to determine whether pesticides continue to meet the statutory standard of no unreasonable adverse effects (and a reasonable certainty of no harm, for food-use pesticides), taking into account

¹⁹ Test protocols and laboratory practices are issued as regulations and may be found in Title 40 of the *Code of Federal Regulations*, Sections 158 and 160.

²⁰ EPA, Pesticide Reregistration Facts, November 18, 2011, http://www.epa.gov/oppsrrd1/reregistration/reregistration_facts.htm.

changes in scientific capabilities for assessing risk, as well as changes in policies and pesticide use practices over time. Registration review is replacing EPA's reregistration and tolerance reassessment programs.²¹

Special Review

EPA continues to evaluate the safety of pesticides after they are registered as new information becomes available. FIFRA requires registrants to report promptly any new evidence of adverse effects from pesticide exposure. If evidence indicates that a registered pesticide may pose an unreasonable risk, EPA may initiate a special review of available information to reevaluate the risks and benefits of each registered use. FIFRA also authorizes EPA to require registrants to conduct new studies to fill gaps in scientific understanding to assist risk assessments. As a result of a special review EPA may conclude that registration is adequate, needs amendment, or should be canceled.

Canceling or Suspending a Registration

If a special review or reregistration evaluation finds that a registered use may cause "unreasonable adverse effects," EPA may amend or cancel the registration.²² FIFRA also allows registrants to request cancellation or amendment of a registration to terminate selected pesticide uses. Requesting voluntary cancellation sometimes reflects a registrant's conclusion that the cost of additional studies is not worth the expected benefit (that is, profit) from sales if the registration would be maintained.

If a registration is canceled for one or more uses of a pesticide, FIFRA does not permit it to be sold or distributed for those uses in the United States, although for a specified period of time, U.S. farmers may use remaining stocks, and commerce may continue for commodities that were legally treated with the pesticide. FIFRA allows registrants to appeal an EPA decision to cancel a registration. An appeal initiates a lengthy review process during which the product may continue to be marketed. However, if there is threat of an "imminent hazard" during the time required to cancel a registration, FIFRA authorizes EPA to suspend registration. Suspension orders, which also may be appealed, stop sales and use of the pesticide.

In the event of suspension and cancellation, FIFRA Section 15 directs EPA to request an appropriation from Congress to compensate anyone who owned any of the pesticide and suffered any loss due to the suspension or cancellation. The registrant of the suspended and canceled product is responsible, however, for all of the transportation and disposal costs, and most storage costs.

²¹ For a more detailed overview of EPA's registration review process, and updated information on EPA's schedule for opening dockets to begin pesticide registration reviews, see http://www.epa.gov/oppsrrd1/registration_review/reg_review_process.htm, updated May 9, 2012.

²² Registrations also may be canceled under other conditions, for example, if data are not submitted in response to EPA's request for additional information to maintain a registration or if a registrant fails to pay the maintenance fee.

Use of Unregistered Pesticides

FIFRA also allows for unregistered use of pesticide products in special circumstances. Section 5 allows experimental use permits for purposes of research and to collect data needed to register a pesticide. Section 18 allows “emergency exemptions” from the provisions of FIFRA to be granted to federal or state agencies, for example, if there is a virulent outbreak of a disease that cannot be controlled by registered products. In addition, Section 24(c) permits states to allow additional uses of a federally registered product to meet “special local needs.”

Enforcement

Generally, EPA has the authority to enforce FIFRA requirements. However, FIFRA Section 26 gives states with adequate enforcement procedures, laws, and regulations primary authority, including inspection authority, for enforcing FIFRA provisions related to pesticide use. EPA is authorized by Section 27 to rescind a state’s primary enforcement responsibility if it is not being carried out.

FIFRA Section 11 authorizes EPA to form cooperative agreements with states, giving them the responsibility for training and certifying applicators of restricted use pesticides. States also may initially review and give preliminary approval to applications for emergency exemptions and special local needs registrations (although under some conditions FIFRA allows EPA later to deny state-approved applications).

Section 9 authorizes inspections by EPA and authorized state officials of pesticide products where they are stored for distribution or sale. Section 13 authorizes EPA to issue orders to stop sales and to seize supplies of pesticide products. Civil and criminal penalties for violations of FIFRA are established in Section 14, while Section 15 provides indemnity payments for end users, distributors, and dealers of pesticides when registrations are suspended and canceled.

Federal district courts are authorized in Section 16 to review EPA final actions and omissions when action is not discretionary. People adversely affected by an EPA order may file for judicial review of the order following a hearing. But FIFRA does not authorize citizen suits against violators.

Export of Unregistered Pesticides

FIFRA does not give EPA the authority to regulate domestic production for export of unregistered pesticides, even if U.S. registration has been canceled for health or environmental reasons. However, FIFRA does require exporters to prepare or pack pesticides as specified by the purchaser and in accord with some of the FIFRA labeling provisions. For example, exporters must translate warning information into the language of the destination. FIFRA also requires exporters of unregistered pesticides to obtain the purchaser’s signature on a statement acknowledging that the pesticide is unregistered and cannot be sold in the United States. EPA is required to notify governments of other countries and international agencies whenever a registration, cancellation, or suspension of any pesticide becomes or ceases to be effective in the United States.

Table 3. Major U.S. Code Sections of the Federal Insecticide, Fungicide, and Rodenticide Act
(codified generally as 7 U.S.C. 136-136y)

7 U.S.C.	Section Title	FIFRA
	Short title and table of contents	§1
136	Definitions	§2
136a	Registration of pesticides	§3
136a-1	Reregistration of registered pesticides	§4
136c	Experimental use permits	§5
136d	Administration review; suspension	§6
136e	Registration of establishments	§7
136f	Books and records	§8
136g	Inspection of establishments	§9
136h	Protection of trade secrets and other information	§10
136i	Restricted use pesticides; applicators	§11
136j	Unlawful acts	§12
136k	Stop sale, use, removal, and seizure	§13
136l	Penalties	§14
136m	Indemnities	§15
136n	Administrative procedure; judicial review	§16
136o	Imports and exports	§17
136p	Exemption of federal and state agencies	§18
136q	Storage, disposal, transportation, and recall	§19
136r	Research and monitoring	§20
136s	Solicitation of comments; notice of public hearings	§21
136t	Delegation and cooperation	§22
136u	State cooperation, aid, training	§23
136v	Authority of states	§24
136w	Authority of Administrator	§25
136w-1	State primary enforcement responsibility	§26
136w-2	Failure by the state to assure enforcement of state pesticide use regulations	§27
136w-3	Identification of pests; cooperation with Department of Agriculture's program	§28
136w-4	Annual report	§29
136w-5	Minimum requirements for training of maintenance applicators and service technicians	§30
136w-6	Environmental Protection Agency minor use program	§31
136w-7	Department of Agriculture minor use program	§32
136w-8	Pesticide Registration Service Fees	§33

7 U.S.C.	Section Title	FIFRA
136x	Severability	§34
136y	Authorization of Appropriations	§35

Note: This table shows only the major code sections. For more detail and to determine when a section was added, the reader should consult the official printed version of the *U.S. Code*.

Table 4. Major U.S. Code Sections of the Federal Food, Drug, and Cosmetic Act Related to Pesticides

(codified generally as 21 U.S.C. 321-346a)

21 U.S.C.	Section Title	FFDCA
Chapter II—Definitions		
321	Definitions	§201
Chapter III—Prohibited Acts and Penalties		
331	Prohibited acts	§301
332	Injunction proceedings	§302
333	Penalties	§303
334	Seizure	§304
Chapter IV—Food		
342	Adulterated food	§402
343	Misbranded food	§403
346	Tolerances for poisonous ingredients in food	§406
346a	Tolerances and exemptions for pesticide chemical residues	§408
346a(a)	Requirement for tolerance or exemption	§408(a)
346a(b)	Authority and standard for tolerance	§408(b)
346a(c)	Authority and standard for exemptions	§408(c)
346a(d)	Petition for tolerance or exemption	§408(d)
346a(e)	Action on Administrator's own initiative	§408(e)
346a(f)	Special data requirements	§408(f)
346a(g)	Effective data, objections, hearings, and administrative review	§408(g)
346a(h)	Judicial review	§408(h)
346a(i)	Confidentiality and use of data	§408(i)
346a(j)	Status of previously issued regulations	§408(j)
346a(k)	Transitional provision	§408(k)
346a(l)	Harmonization with action under other laws	§408(l)
346a(m)	Fees	§408(m)
346a(n)	National uniformity of tolerances	§408(n)
346a(o)	Consumer right to know	§408(o)
346a(p)	Estrogenic substances screening program	§408(p)
346a(q)	Schedule for review	§408(q)

21 U.S.C.	Section Title	FFDCA
346a(r)	Temporary tolerance or exemption	§408(r)
346a(s)	Savings clause	§408(s)

Note: This table shows only the major code sections. For more detail and to determine when a section was added, the reader should consult the official printed version of the *U.S. Code*.

Selected References

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