

SHAUGHNESSEY NO.

122010 ok

122001

REVIEW NO.

3

EEB BRANCH REVIEW

DATE: IN 8-31-84

OUT 7 Nov 1984

FILE OR REG. NO. 352-UGL

PETITION OR EXP. PERMIT NO. _____

DATE OF SUBMISSION 7-30-84

DATE RECEIVED BY HED 8-31-84

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RD ACTION CODE/TYPE OF REVIEW 110/New Chemical

TYPE PRODUCT(S): I, D, H, F, N, R, S Herbicide

DATA ACCESSION NO(S). _____

PRODUCT MANAGER NO. R. Taylor (25)

PRODUCT NAME(S) DuPont Ally Herbicide

(OR DPX-T6376)

COMPANY NAME E.I. DuPont De Nemours & Company

SUBMISSION PURPOSE Proposed full registration of uses in small-

grain cereals and reduced-tillage fallow

systems

SHAUGHNESSEY NO.

CHEMICAL, & FORMULATION

% A.I.

122010

metsulfuron methyl

60%

Pesticide name: Ally (or DPX-T6376)

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

Proposed full registration of use as selective weed control in small-grain cereals and reduced tillage fallow systems.

100.2 Formulation Information

active ingredient: metsulfuron methyl60%

inert ingredients:40%

100.3 Application Methods, Directions, Rates

Ally is a dry flowable granule that is suspended in water and applied as a uniform broadcast spray for selective weed control in wheat and barley. Ally is also used for fallow weed control (to reduce tillage) preceding wheat, barley or oats.

For in-crop application Ally should be applied early postemergent. Fallow applications can be made preemergent or postemergent to weeds anytime the ground is not frozen. Herbicide combinations may be required for certain weeds. Degree of control and duration of effect depend on: a) rate used, b) weed spectrum, c) weed size, d) growing conditions at and following time of application, and e) precipitation.

The following directions are from the label:

IN-CROP WEED CONTROL/USE RATE TABLE

Unless directed otherwise on this label, for best weed control or suppression, apply postemergent when broadleaf weeds are less than 2" tall or in diameter and when crop canopy will not prevent thorough coverage of target weeds. Always include a surfactant. Do not use less than 1/10 ounce per acre.

<u>Weeds Controlled or Suppressed*</u>		<u>Rate Ounces Per Acre</u>	<u>Acres Treated Per 8 ounce Container</u>
Bittercress	Miners lettuce	1/10	80
Blue mustard (purple)	Pigweed (redroot, smooth, tumble)		
Bur buttercup	Prickly lettuce		
Chickweed (common)	Shepherdspurse		
Conical catchfly	Smartweed (green, pale, ladythumb)		
Corn cockle	Sowthistle (annual)		
Dogfennel	Wild mustard		
Field pennycress (fanweed)			
Mayweed			

Above list plus:

Wild buckwheat*	Kochia	1/5	40
Canada thistle*	Lambsquarters*		
Corn gromwell*	(common, slimleaf)		
Smallseed falseflax	Russian thistle		
Fiddleneck* (tarweed)	Sunflower		
Filaree	Tansy mustard		
Flixweed*	Treacle mustard		
Groundsel (common)	Tumble mustard		
Henbit	(Jim Hill)		
Knotweed (prostrate)			

*Weeds marked with an asterisk are suppressed. Weed suppression is a visual reduction in weed competition (reduced population or vigor) as compared to untreated area. Degree of suppression will vary with size of weed and environmental conditions following treatment. See "Specific Weed Problems" section concerning wild buckwheat, Canada thistle, corn gromwell, fiddleneck, flixweed and lambsquarters.

"Ally" will not control wild oats or other grasses, therefore, apply "Ally" with a suitable registered product either as a tank mix or sequential treatment for grass control.

SPECIFIC WEED PROBLEMS:

Canada thistle: Apply "Ally" plus surfactant in the spring after the majority of thistles have emerged and are small (rosette stage to 6" elongating stems) but actively growing. An application will inhibit the ability of emerged Canada thistle to compete with the crop.

Wild Buckwheat, Corn Gromwell, Fiddleneck, Flixweed and Lambsquarters:
Apply "Ally" plus surfactant postemergent when weeds are less than 2" tall or in diameter and are actively growing. Thorough coverage is important.

CROP ROTATION GUIDELINES:

Recropping plans are determined by rate of "Ally" applied and a minimum recropping interval. Minimum recrop interval is from time of last application to date of planting. For maximum rotation flexibility, do not use "Ally" on all wheat or barley acreage.

<u>Rate Used (ounce/acre)</u>	<u>Crop To Be Planted</u>	<u>Minimum Recropping Interval (months)</u>
1/5	winter/spring wheat	0
1/10 to 1/5	durum wheat, barley, oats, sorghum (grain, forage)	10
1/10 to 1/5	alfalfa, dry beans, corn, flax, lentils, peas, safflower, soybeans, sunflower, sugarbeets and others	22

TIMING FOR POSTEMERGENCE APPLICATION TO WHEAT OR BARLEY:

Apply "Ally" (1/10 to 1/5 ounce per acre) postemergent to spring or winter wheat or barley after the 2 to 3 leaf stage, but before boot stage. For maximum performance, apply to actively growing annual broadleaf weeds which are less than 2" tall or in diameter prior to crop canopy closing in.

SPRAY PREPARATION/TANK MIXES:

Pour the proper amount of "Ally" into the necessary volume of water in the spray tank with the agitator running. Continuous agitation is required for a uniform suspension and application.

Use spray preparation of "Ally" within 24 hours or product degradation may occur. If spray preparation is left standing without agitation, thoroughly agitate before re-using.

Surfactant - Use a surfactant of at least 80% active ingredient to improve wetting and/or contact activity of "Ally". Add surfactant as the last ingredient at the rate of 1 quart per 100 gallons of spray volume. Antifoaming agents may be needed.

Liquid Fertilizer - Slurry "Ally" in water; then thoroughly mix the slurry into the liquid fertilizer. Do not add a surfactant. Run a tank mix compatability test before mixing "Ally" in fertilizer solutions.

Tank Mixtures - Tank mix "Ally" with a suitable registered herbicide if weeds larger than "Ally" label guidelines are present or if weeds other than those listed for "Ally" are present or anticipated (follow manufacturer's label). "Ally" must be in suspension before adding the companion herbicide. Follow the surfactant recommendation of the companion herbicide. If application timing of companion herbicide differs from "Ally", apply separately as recommended for each product.

EQUIPMENT - SPRAY VOLUMES:

Apply using properly calibrated air or ground equipment. Select a spray volume and delivery system that will ensure thorough coverage and a uniform spray pattern. For ground application, flat fan nozzles are recommended (minimum 3 gallon spray volume per acre, GPA). When using flood jet or "Raindrop" nozzles, use higher spray volume (minimum 20 GPA) to ensure thorough coverage. Use at least 1 GPA by air (In Idaho, Oregon, Utah and Washington use at least 3 GPA by air). Use 50-mesh screens or larger.

If weeds to be sprayed are stressed (drought and/or cold temperatures), or crop canopy will prevent thorough coverage of target weeds, use higher spray volumes and rate to provide better coverage and control.

Continuous agitation is required to keep "Ally" in suspension. Avoid overlapping, and shut off spray booms while starting, turning, slowing or stopping to prevent over-application.

Note: Do not allow spray to drift onto adjacent crops, or onto agriculture land scheduled to be planted to crops other than wheat, barley or oats as injury to the crop may occur. Extreme care must be taken to prevent drift to desirable plants or nontarget agricultural land.

REDUCED-TILLAGE FALLOW WEED CONTROL/USE RATE TABLE

Fallow applications of "Ally" are made to ground preceding wheat, barley, or oat planting. Do not apply more than 3/5 ounce of "Ally" within a 10 month period. See "Crop Rotation Guideline" section for specific rotation intervals.

For maximum long term control for each weed, use the higher recommended rate. Also use the higher rate for control of larger less susceptible weeds and for weeds hardened-off by drought or cold weather. Do not use less than 1/5 ounce per acre.

Weeds Controlled		Rate Ounces Per Acre	Acres Treated Per 8 Ounce Container
Blue mustard	Pigweed (redroot, tumble)	1/5 to 2/5	40 to 20
Bur buttercup	Prickly lettuce		
False chamomile	Smallseed falseflax		
Fiddleneck (tarweed)	Sunflower		
Henbit	Tansy mustard		
Mayweed	Tumble mustard (Jim Hill)		
	Wild mustard		
Above list plus:			
Wild buckwheat	Lambsquarters (common,	2/5 to 3/5	20 to 13.3
Flixweed	slimleaf)		
Kochia	Russian thistle		

CROP ROTATION GUIDELINES:

Recropping plans are determined by rate of "Ally" applied and a minimum recropping interval. Minimum recrop interval is from time of last application to the anticipated date of wheat, barley, or oat planting. For maximum rotation flexibility, do not use "Ally" on all your reduced tillage fallow acreage.

Rate Used (ounce/acre)	Crop To Be Planted	Minimum Recropping Interval (months)
2/5 to 3/5	winter/spring wheat	4
2/5	durum wheat, barley, oats	18
2/5 to 3/5	others	36 to 48 or more*

***IMPORTANT** - Land previously treated with "Ally" at 2/5 to 3/5 cannot be rotated to crops other than wheat, barley, or spring oats until a FIELD BIOASSAY confirms that residues of "Ally" are not present. A FIELD BIOASSAY involves growing a test strip of the crop(s) intended for production the following year in fields previously treated with "Ally". Crop response will indicate whether or not to rotate to the crop(s) used in the test strip. See separate Du Pont bulletin "Ally" Field Bioassay." Failure to follow these instructions could result in injury to subsequent crops.

TIMING OF FALLOW APPLICATIONS:

Four options are available for use of "Ally" to reduce tillage.

1. Summer or Fall (post-harvest) - Apply "Ally" early postemergent to small actively growing weeds.
2. Spring (during fallow) - Apply "Ally" early postemergent to small actively growing weeds.

3. Summer, Fall, Spring - Apply "Ally" as a preemergent application to broadleaf weeds. Rainfall following treatment to wet the soil 2 to 3" in depth (usually 1/2 to 1 inch) is necessary to obtain best results.

4. Post-Harvest Contact Control - Apply "Ally" plus surfactant (2 to 3 quarts per 100 gallons of spray volume) to emerged sensitive weeds as soon as possible after harvest. For best results apply when temperatures exceed 70°F. Thorough coverage is essential. Do not treat weeds that have been previously treated with another herbicide.

Determine use rate according to Weed Control/Use Rate Table.

Determine crop rotation planting date according to "Crop Rotation Guidelines" section.

SPRAY PREPARATION/TANK MIXTURES/SEQUENTIAL TREATMENTS:

Pour the proper amount of "Ally" into the necessary volume of water in the spray tank with the agitator running. Continuous agitation is required for a uniform suspension and application.

Use spray preparation of "Ally" within 24 hours or product degradation may occur. If spray preparation is left standing, thoroughly agitate before re-using.

Surfactant - Use a surfactant of at least 80% active ingredient in postemergence applications to weeds. Add surfactant as the last ingredient at the rates of 1 to 2 quarts per 100 gallons of spray volume. Antifoaming agents may be needed.

Tank Mixtures/Sequential Treatments

AllyTM plus Roundup¹ - Use for control of broadleaf, volunteer cereals and grassy weeds. For best results, apply this mixture to small (6" tall or less) actively growing broadleaf and grassy weeds. "Ally" plus Roundup should be applied in 5 to 10 GPA with ground equipment or 3 to 5 GPA by air.

AllyTM plus Residual Herbicides - Tank mix "Ally" for control of volunteer cereals and grassy weeds with other fallow labeled herbicides such as atrazine, Bladex², Igran³, Kerb⁴, Chem Hoe 135⁵ or Lexone DF[®] Herbicide.

If broadleaf and grassy weed stages are not appropriate for tank mix application, apply each product sequentially according to respective label timing guidelines.

AllyTM plus 2,4-D and/or Banvel⁵ - Use for control of broadleaf weeds that are larger than "Ally" label guidelines or if broadleaf weeds other than those listed for "Ally" are present (follow manufacturer's label).

In tank mixtures, "Ally" must be in suspension before adding the companion herbicides or spray adjuvant. See Weed Control/Use Rate Table for recommended rates of "Ally".

Follow all use instructions, label rates, warnings, precautions and surfactant recommendations of companion herbicides.

EQUIPMENT - SPRAY VOLUMES:

Apply using properly calibrated air or ground equipment. Select a spray volume and delivery system that will ensure thorough coverage and a uniform spray pattern. For ground application, flat fan nozzles are recommended (minimum 3 GPA). When using flood jet or "Raindrop" nozzles, use higher spray volume (minimum 20 GPA) to ensure thorough coverage. Use at least 1 GPA by air (In Idaho, Oregon, Utah and Washington use at least 3 GPA by air). For post-harvest contact weed control, apply "Ally" in 3 to 5 GPA by air or 10 to 25 GPA with ground equipment. Use 50-mesh screens or larger in all applications.

When stubble is dense and/or weeds are stressed (drought and/or cold weather), use higher spray volumes and rates to provide better coverage and control.

Continuous agitation is required to keep "Ally" in suspension. Avoid overlapping, and shut off spray booms while starting, turning, slowing or stopping to prevent over-application.

Note: Do not allow spray to drift onto adjacent crops, or onto agriculture land scheduled to be planted to crops other than wheat, barley or oats as injury to the crop may occur. Extreme care must be taken to prevent drift to desirable plants or nontarget agricultural land.

SPRAYER CLEANUP

To avoid subsequent injury to crops other than wheat, barley, or oats, immediately after spraying thoroughly remove all traces of "Ally" from mixing and spray equipment as follows:

1. Drain tank; then flush tank, boom and hoses with clean water for a minimum of ten minutes.
2. Fill the tank with clean water then add 1/2 gallon chlorine bleach (containing 5 1/4% sodium hypochlorite) per 100 gallons of water. Flush solution through boom and hoses, then allow to sit for 15 minutes with agitation; then drain.
3. Repeat Step 2.
4. Nozzles and screens should be removed and cleaned separately. To remove traces of chlorine bleach, rinse the tank thoroughly with clean water and flush through hoses and boom.

CAUTION: Do not use chlorine bleach with ammonia. All traces of liquid fertilizer containing ammonia, ammonium nitrate or ammonium sulphate must be rinsed with water from the mixing and application equipment before adding chlorine bleach solution. Failure to do so will release a gas with a musty chlorine odor which can cause eye, nose, throat, and lung irritation. Do not clean equipment in an enclosed area.

PRECAUTIONS

Do not apply more than 3/5 ounce/acre per year.

Do not apply to irrigated land where tail water will be used to irrigate crop land.

Because varieties of wheat and barley differ in their tolerance to herbicides, limit first use of "Ally" to a small area of each variety prior to adoption as a field practice.

Do not apply "Ally" to a wheat or barley crop that is stressed by severe weather conditions, drought, low fertility, water saturated soil, disease or insect damage as crop injury may result. Severe winter stress, drought, disease or insect damage following application also may result in crop injury.

Under certain conditions such as heavy rainfall, prolonged cool weather, frost conditions (wide fluctuations in day/night temperatures) just prior to or soon after application, temporary discoloration and/or crop injury may occur. "Ally" and methyl or ethyl parathion tank mixtures also may cause temporary discoloration.

To prevent cold weather related crop injury, avoid making applications during winter months when weather conditions are unpredictable and can be severe.

Do not apply to wheat or barley undersown with legumes or grasses as injury to the forage may result.

STORAGE AND DISPOSAL

Storage - Store product only in the original container and away from other pesticides, fertilizer, food or feed.

Disposal - Do not contaminate water, food, or feed by storage, disposal or cleaning of equipment. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Triple rinse (or equivalent) the container and then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or by incineration or, if allowed by state and local authorities by burning. If burned, stay out of smoke.

100.4 Target Organisms

See label list of target weeds in section 100.3 above.

100.5 Precautionary Labeling

Keep out of any body of water.

101 Hazard Assessment

101.1 Discussion

Ally is proposed for use on wheat, barley and oats and reduced tillage fallow systems. The acreages involved are great: in 1982 some 87,277,000 acres were planted to wheat in the United States, 14,211,000 acres to oats and 9,634,000 acres to barley (agriculture Statistics, 1983, USDA).

101.2 Likelihood of Adverse Effects to Non-Target Organisms

As noted in previous reviews (EUP for cereal grains, 4/6/83 by Fite), Ally is considered practically non-toxic to birds and fish. "At the highest proposed use rate, 0.03 lb a.i./A, maximum concentrations of [Ally] in a 6-inch body of water if directly applied would be 22 ppb a.i., well below toxicity figures reported from laboratory tests on aquatic species. These tests showed the LC₅₀ for all aquatic species to be > 150 ppm. For terrestrial habitat theoretical calculations indicate that maximum expected concentrations on vegetation at the highest proposed application rate range from 0.2 to 7.0 ppm. Again these values are well below laboratory figures for indicator species: mallard and bobwhite LC₅₀ > 5620 ppm. The same indication is found for mammals, with the LC₅₀ of laboratory rats reported to be greater than 5000 ppm" (ibid).

While acute toxicity to non-target organisms is not of significant concern, Ally may pose more serious chronic hazards. Hydrolysis tests found Ally to be stable at 25°C, pHs of 7 and 9, and to have a half-life of 2 hours at 45°C, pH2. Exposure Assessment Branch is currently completing an environmental fate profile, however that profile is not scheduled for completion prior to the due date for this review from EEB. Therefore EEB restricts comments to the effect that only acute toxicity is not of concern at this time. If at a later date, following results from EAB, chronic hazards to non-target organisms are considered possible, further tests may be required of the registrant to permit a full risk evaluation of Ally.

101.3 Endangered Species Considerations

Although Ally is proposed for use on very large acreages, its practically non-toxic status negates much concern over adverse effects to endangered species, with the exception of certain broad-leaved plants. If such endangered plants are in the vicinity of Ally use, these populations will be adversely effected.

101.4 Adequacy of Toxicity Data

All six wildlife and aquatic organism studies required to support registration are valid, core studies, and are listed below.

Avian Acute Oral	LD ₅₀	Mallard	>2510 mg/kg	Core
Avian Subacute	LC ₅₀	Mallard	>5620 ppm	Core
Avian Subacute Dietary	LC ₅₀	Bobwhite	>5620 ppm	Core
Fish Acute 96-hr	LC ₅₀	Bluegill		
		Sunfish	>150 ppm	Core
Fish Acute 96-hr	LC ₅₀	Rainbow		
		Trout	>150 ppm	Core
Aquatic Invertebrate				
Acute 48-hr	LC ₅₀	<u>Daphnia</u>	>150 ppm	Core
Additional Tests: Honey Bee				
Acute Contact	LD ₅₀	<u>Apis</u>	>25 ug/bee	Core

Pending EAB results, further tests may be needed to evaluate chronic impacts of Ally to non-target organisms.

101.5 Adequacy of Labeling

The label is adequate.

103 Conclusions

EEB has completed a partial risk assessment of the proposed registration of Ally for use as selective weed control in small-grain cereals and reduced tillage fallow systems.

Based upon the available data and use information EEB concludes that the proposed uses provide for minimal hazards to nontarget organisms.

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