FEB 9 1998

hs. Karen S. Stumpf
Novartis Crop Protection, Inc.
P.O. Box 18300
Greensboro, NC 27419-8300

Dear Ms. Stumpf:

Subject: Pennant[®] Liquid Herbicide Subject: EPA Registration No. 100-691

Application and Your Letter Dated January 21, 1998, Requested Label Revisions, WPS Personal Protective Equipment and Precautionary Statements and Statements of Practical Treatment

The proposed label revisions listed in your application have been reviewed and found acceptable as amendments to the subject pesticide product registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) as amended provided that you:

o Submit one (1) copy of the final printed labeling prior to sniping this product under the subject labeling.

If this condition is not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of this product under the subject labeling constitutes acceptance of this condition. A stamped copy of the labeling is enclosed for your records.

Sincerely yours,

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

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Enclosure

CONCURRENCES								
SYMBOL	M			,				
SURNAME				••••••			1	
DATE	wilson:Di	skette:Me	tolachlor	- 02-09-4		 		
	1320-1 (12-70)	· .		. ,		 OFFICE	AL FILE COPY	

•••••••••••••••••••••••••••••••••••••			ACCEPTE with COMMEN	Dof 29
	Pennant® Liquid	(Front Label)	Under the Federal In Fundicide, and Roden as amended, for the registered under EPA	998 secticide, ticide Act
	Active Ingredient:	es, turf, and landscape plar	<u>/00-69</u> ntings	·
• • •	Inert Ingredients: Total:	-ethyl-6-methylphenyl)- /l) acetamide /lbs. active ingredient per ga	<u>13.6%</u> 100.0%	
-	KEEP OUT OF REACH O	F CHILDREN	مرید ب	
	See additional precautional booklet. EPA Reg. No. 100-691 EPA Est. 42761-MS-1 ^R EPA Est. 5905-GA-01 ^H	ry statements and direction	s for use inside	•
		f lot number on jug) (gallon) f lot number on bottle) (quar		
	One Quart U.S. Standard Measure 4 fl. oz. U.S. Standard Measure			د د د د د د د د د
	This booklet manufactured NCP 96L1J 0797 - 1 gal. NCP 96L6G 0797 - 1 qt. NCP 96L7E 0797 - 4 fl. oz	using post-consumer, recyc		
	[QUARK/PENNANT/N-PEN	NNANT-LIQ] - ccg - 12/2/97		- بن بنبن بنبن بنبن بنبن

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DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

IMPORTANT: Read the entire Directions for Use and the Conditions of Sale and Warranty before using this product. If terms are not acceptable, return the unopened product container at once.

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 should be followed carefully. However, it is impossible to eliminate all risks inherently associated with 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 the manner of use or application all of which are beyond the control of Novartis Crop Protection, Inc. or the Seller. All such risks shall be assumed by the Buyer.

Novartis warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use subject to the inherent risks referred to above. Novartis makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty. In no case shall Novartis or the Seller be liable for consequential, special, or indirect damages resulting from the use or handling of this product. Novartis and the Seller offer this product, and the Buyer and user accept it, subject to the foregoing Conditions of Sale and Warranty, which may be varied only by agreement in writing signed by a duly authorized representative of Novartis.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

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

AGRICULTURAL USE REQUIREMENTS

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

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

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

- Coveralis
- Chemical-resistant gloves, such as barrier laminate or viton
- Shoes plus socks

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter or allow others to enter the treated area until sprays have dried.

FAILURE TO FOLLOW THE DIRECTIONS FOR USE AND PRECAUTIONS ON THIS LABEL MAY RESULT IN POOR WEED CONTROL, CROP INJURY, AND/OR ILLEGAL RESIDUES.

GENERAL INFORMATION

Pennant Liquid herbicide controls many annual grasses, certain broadleaf weeds, and yellow nutsedge.

Pennant Liquid may be used on commercial and residential turf and other noncrop land, including, but not limited to: airports, roadsides, golf courses, sports fields, public recreational areas, ornamental gardens, cemeteries, and other landscaped areas. Pennant Liquid may also be used in and around container and field-grown ornamentals, nonbearing nursery stock, and on sod farms.

DO NOT USE IN GREENHOUSES OR OTHER ENCLOSED STRUCTURES.

Do not apply under conditions which favor runoff or wind erosion of soil containing this product to non-target areas.

To prevent off-site movement due to runoff or wind erosion.

- 1. Avoid treating powdery dry or light sand soils when conditions are favorable for wind erosion. Under these conditions, the soil surface for should first be settled by rainfall or irrigation.
- 2. Do not apply to impervious substrates such as paved or highly, compacted surfaces.
- 3. Do not use tailwater from the first flood or furrow irrigation of treated fields to treat non-target crops unless at least 1/2 inch of rainfall has 3, occurred between application and the first irrigation.

NOTICE TO USER: Plant tolerances to Pennant Liquid herbicide have been found to be acceptable in the specific genera and species listed on this label. Because of the large number of species and varieties of plants, it is impossible to test each for tolerance to. Pennant Liquid. Neither the manufacturer nor the seller has determined whether or not Pennant Liquid can be used safely on plants not specified on this label. Therefore, the professional user should determine if Pennant Liquid can be used safely by testing the recommended rates on a particular group of similar unlabeled ornamental plants in a small area before widespread use or by checking with the local weed specialist for guidance. Likewise, if the professional user plans to apply Pennant Liquid for control of weed species not listed on this label, Pennant Liquid should be tested on a small-scale basis before widespread use or the local weed specialist contacted for guidance.

Mixing Instructions

Pennant Liquid Alone: Mix Pennant Liquid with water or fluid fertilizer and apply as a spray. Fill the spray tank 1/2-3/4 full with water or fluid fertilizer, start agitation, add the proper amount of Pennant Liquid, then add the rest of the water or fluid fertilizer. Agitate continuously during mixing and application to maintain a uniform emulsion.

Tank Mixtures: Fill the spray tank 1/4 full with water or fluid fertilizer, and start agitation, then add the tank-mix partner, allowing it to become dispersed. Then add Pennant Liquid, and finally the rest of the water or fluid fertilizer. Agitate continuously during mixing and application to maintain uniformity. Check compatibility of mixture with fluid fertilizer as described below before mixing in spray tank.

Note: Before using Pennant Liquid in a tank mix with fluid fertilizer or registered pesticides, determine the tolerance of the plant species by applying the combination to a limited area during a period of active growth.

Compatibility Test: Since liquid fertilizers can vary, even within the same analysis, always **check compatibility with herbicide(s) each time before use.** Be especially careful when using **complete** suspension or fluid fertilizers as serious compatibility problems are more likely to occur. Commercial application equipment may improve compatibility in some instances. The following test assumes a spray volume of 25 gals *J*A.; For other spray volumes, make appropriate changes in the ingredients.

1. Add 1 pt. of fertilizer to each of 2 one-qt. jars with tight lids

2. To one of the jars, add 1/4 tsp. or 1.1 milliliters of a compatibility

agent approved for this use, such as Compex® or Unite® (1/4 tsp. is equivalent to 2 pts./100 gals. spray). Shake or stir gently to mix.

3. To both jars, add the appropriate amount of herbicide(s). If more than one herbicide is used, add them separately with dry herbicides first, flowables next, and emulsifiable concentrates last. After each addition, shake or stir gently to thoroughly mix. The appropriate amount of herbicides for this test follows:

Dry herbicides: For each pound to be applied per acre, add 1.5 level teaspoons to each jar.

Liquid herbicides: For each pint to be applied per acre, add 0.5 teaspoon or 2.5 milliliters to each jar.

After adding all ingredients, put lids on and tighten, and invert each jar 10 times to mix. Let the mixtures stand 15 minutes and then look for separation, large flakes, precipitates, gels, heavy oily film on the jar, or other signs of incompatibility. Determine if the compatibility agent is needed in the spray mixture by comparing the 2 jars. If either mixture separates, but can be readily remixed, the mixture can be sprayed as long as good agitation is used. If the mixtures are incompatible, test the following methods of improving compatibility: (a) slurry the dry herbicide(s) in water before addition, or (b) add 1/2 of the compatibility agent to the fertilizer and the other 1/2 to the emulsifiable concentrate or flowable herbicide before the addition to the mixture. If incompatibility is still observed, do not use the mixture.

4. After conducting the compatibility test, any pesticide wastes should be disposed of according to the instructions given in the **Storage** and **Disposal** section at the end of this label.

Ground Application: Apply Pennant Liquid alone or in tank mixtures by ground equipment in a minimum of 10 gals. of spray mixture per acre, unless otherwise specified.

Use sprayers that provide accurate and uniform application. For Pennant Liquid tank mixtures with wettable powder or dry flowable formulations, screens and strainers should be no finer than 50-mesh. Rinse sprayer thoroughly with clean water immediately after use.

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Calculate the amount of herbicide needed for band treatment by the formula:

band width in inches row width in inches X per acre.

broadcast rate

amount needed = per acre of field

Aerial Application (Sod Farms Only): Apply Pennant Liquid in water alone or in tank mixtures with AAtrex®, Princep®, or other herbicides registered for use on sod farms in a minimum total volume of 2 gals./A by aircraft. Avoid application under conditions where uniform coverage cannot be obtained or where excessive sprav drift may occur. In order to assure that spray will be controllable within the target area when used according to label directions, make applications at a maximum height of 10 ft., using low-drift nozzles at a maximum pressure of 40 psi, and restrict application to periods when wind speed does not exceed 10 mph. To assure that spray will not adversely affect adjacent sensitive non-target plants, apply Pennant Liquid or Pennant Liquid mixtures at a minimum upwind distance of 400 ft. from sensitive plants.

Avoid application to humans or animals. Flagmen and loaders should avoid inhalation of spray mist and prolonged contact with skin.

Aerial Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

- The distance of the outer most nozzles on the boom must not 1. exceed 3/4 the length of the wingspan or rotor.
- 2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory Information section below.

Aerial Drift Reduction Advisory Information

Information on Droplet Size

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The most effective way to reduce drift potential is to apply large droplets.

The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size

- Volume Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- Number of nozzles Use the minimum number of nozzles that provide uniform coverage.
- Nozzle Orientation Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- Nozzle Type Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets_and the lowest drift.

Boom Length

For some use patterns, reducing the effective boom length to less than ³/₄ of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height

Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced ', downward. Therefore, on the up and downwind edges of the field; the applicator must compensate for this displacement by adjusting the path of ' the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to 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. They begin to form as the sun sets and often continues into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Overhead or Microjet Irrigation Application: Pennant Liquid alone or in tank mixture with other herbicides which are registered for overhead or microjet application may be applied in irrigation water at rates recommended on this label. Apply this product only through an overhead or microjet irrigation system. Do not apply this product through any other type of irrigation system. Crop injury or lack of effectiveness can result from non-uniform distribution of treated water. If you have questions, equipment manufacturers, or other experts. Do not connect an irrigation of system system (including greenhouse systems) used for pesticide application to a

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public water system, unless the pesticide label-prescribed safety devices for public water systems are in place. A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Operation Instructions

- 1. The system must contain a functional check-valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water-source contamination from backflow.
- 2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check-valve to prevent the flow of fluid back toward the injection pump.
- 3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- 5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- 6. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump), effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- 7. Do not apply when wind speed favors drift beyond the area intended for treatment.
- 8. Prepare a mixture with a minimum of 1 part of water to 1 part herbicide(s) and inject this mixture into the overhead or microjet system. Injecting a larger volume of a more dilute mixture per hour will usually provide more accurate calibration of metering equipment. Maintain sufficient agitation to keep the herbicide in suspension.
- 9. Meter into irrigation water during entire period of water application.
- 10. Apply in 1/2-1 inch of water. Use the lower water volume (1/2 inch) on coarser-textured soils and the higher volume (1 inch) on fine-

textured soils. More than 1 inch of water at application may reduce weed control by moving the herbicide below the effective zone in the soil.

Precaution for overhead or microjet applications: Where sprinkler distribution patterns do not overlap sufficiently, unacceptable weed control may result. Where sprinkler distribution patterns overlap excessively, injury to desirable plants may result.

Dry Bulk Granular Fertilizers

Many dry bulk granular fertilizers may be impregnated or coated with Pennant Liquid alone or with selected Pennant Liquid tank mixtures which are registered and not prohibited from use on dry bulk granular fertilizers.

When applying Pennant Liquid or Pennant Liquid mixtures with dry bulk granular fertilizers, follow all directions for use and precautions on the respective product labels regarding target crops, rates per acre, soil texture, application methods (including timing of application), and rotational crops.

All individual state regulations relating to dry bulk granular fertilizer blending, registration, labeling, and application are the responsibility of the individual and/or company selling the herbicide/fertilizer mixture.

Prepare the granular herbicide/fertilizer mixtures by using any closed drum, belt, ribbon, or other commonly used dry bulk fertilizer blender. Nozzles used to spray Pennant Liquid or Pennant Liquid tank mixtures onto the fertilizer must be placed to provide uniform spray coverage.

If the herbicide/fertilizer mixture is too wet, use a highly absorptive material, such as Agsorb® granules, Microcel E (Johns-Manville Products Corporation), diatomaceous earth, or finely powdered clay, to obtain a dry free-flowing mixture. Add the absorptive material separately and uniformly to the herbicide/fertilizer mixture and blend to form a suitable free-flowing mixture. Generally, less than 2% by weight of absorptive material will be needed.

Calculate amounts of Pennant Liquid and other herbicides needed by the following formula:

2,000 lbs. of fertilizer per acre	х	pts./A of liquid or flowable product	=	pts. of liquid or flowable product per ton of fertilizer	دد در د در د در ر د در ر
2.000 lbs. of fertilizer per acre	х	lbs./A of dry product	=	lbs. of dry product per ton of fertilizes	دد د در در

Precautions: To avoid potential for explosion, (1) Do not impregnate Pennant Liquid or Pennant Liquid mixtures on ammonium nitrate, potassium nitrate or sodium nitrate, either alone or in blends with other fertilizers. (2) Do not combine mixtures of Pennant Liquid plus any other herbicide with single superphosphate (0-20-0) or treble superphosphate (0-46-0). (3) Do not use Pennant Liquid or Pennant Liquid mixtures on straight limestone, since absorption will not be achieved. Fertilizer blends containing limestone can be impregnated.

Application

Apply 100-800 lbs. of the herbicide/fertilizer mixture per acre. For best results, apply the mixture uniformly to the soil with properly calibrated equipment immediately after blending. Uniform application of the herbicide/fertilizer mixture is essential to prevent possible crop injury. Non-uniform application may also result in unsatisfactory weed control. In areas where conventional tillage is practiced, a shallow incorporation of the mixture into the soil may improve weed control. On fine- or medium-textured soils in areas where soil incorporation is not planned, i.e., reduced tillage situations or in some conventional tillage situations, make applications approximately 30 days before planting to allow moisture to move the herbicide/fertilizer mixture into the soil. On coarse-textured soils, make applications approximately 14 days prior to planting.

Precaution: To avoid potential injury of ornamental plants, do not use the herbicide/fertilizer mixture where planting beds are to be formed.

NURSERIES AND LANDSCAPE PLANTINGS

Apply Pennant Liquid at rates indicated below to control many annual grasses, certain broadleaf weeds, and yellow nutsedge (see following list). Calibrate applicator before application according to the manufacturer's directions.

Weeds Controlled

annual bluegrass barnyardgrass (watergrass) crabgrass crowfootgrass fall panicum foxtail millet giant foxtail goosegrass green foxtail prairie cupgrass red rice signalgrass *(Brachiaría)* southwestern cupgrass witchgrass yellow foxtail yellow nutsedge black nightshade carpetweed Florida pusley galinsoga

Weeds Partially Controlled*: common purslane, groundsel, hairy nightshade, sandbur, seedling johnsongrass, shattercane, and volunteer sorghum.

*Control of these weeds can be erratic due partially to variable weather conditions.

Application

Apply Pennant Liquid in sufficient carrier to obtain thorough coverage. For liquid carriers, use a minimum of 10 gals./A. Apply before grass, broadleaf weeds, or yellow nutsedge emerge, or after existing weeds or nutsedge plants have been removed. A second application may be needed to provide control for an extended period.

Soil Texture	Pts./A*	ml/1,000 sq. ft.
Coarse	2-3	22-33
Medium	2-3	22-33
Fine	3-4	33-43

Suggested Rates of Pennant Liquid

*Use higher rates for a given soil texture on high organic matter soils and where yellow nutsedge and/or a heavy infestation of weeds is expected. Use the lower rates on soils with low organic matter content and where light infestations of weeds are expected. In peat and muck soils and soils highly enriched with organic matter (i.e., sawdust) and/or synthetic mixes, the activity of Pennant Liquid may be reduced.

If banded applications are used, refer to the **General Information** section of this label to calculate the amount of Pennant Liquid needed.

Precautions: (1) To avoid plant injury, do not apply Pennant Liquid to seedbeds, cutting beds, or unrooted cuttings before transplanting or to plants until the soil has firmly settled around roots. (2) When Pennant Liquid is applied broadcast over-the-top of plant foliage, follow with sufficient overhead irrigation to wash Pennant Liquid from the foliage to reduce the chance of injury.

Pennant Liquid has been found to be safe on the following plants:

Container-Grown Plants

Scientific Name	Common Name/Variety	······································	_
Abelia grandiflora	Glossy Abelia	·	
Acer rubrum	Red Maple		
Ajuga reptans	Ajuga		
Aucuba japonica variegata	Variegated Aucuba		
Betula nigra	River Birch		
Buxus spp.	Boxwood		
Carex spp.	Carex	•	
Cornus spp.	Dogwood		
Cotoneaster spp.	Cotoneaster		, ·
Euonymus fortunei	Euonymus	• *	
Euonymus kiautschovicus	Manhattan Euonymus		
Forsythia spp.	Forsythia		• •
Gardenia jasminoides	Gardenia		
Hedera helix	English Ivy		1
Hosta lancifolia	Variegated Hosta		
llex attenuata	Savannah Holly		
llex cornuta	Dwarf Burford Holly	<u> </u>	
llex crenata	Japanese Holly		
Juniperus chinensis	Chinese Juniper		
Juniperus horizontalis	Juniper		
Juniperus sabina Juniperus virginiana	Hick's Juniper/Foemina Eastern Red Cedar		
Kalmia spp.	Mountain Laurel		
Leucothoe fontanesiana	Leucothoe		
	Ligustrum or Privet		
Ligustrum japonicum Liriope muscara	Liriope		
Liriope spicata	Green Liriope	-	
Myrica cerifera	Wax Myrtle		
	Mondo Grass	• •	
Ophiopogon japonicus Boobycondro torminalia	Japanese Pachysandra		
Pachysandra terminalis Pinus strobus	White Pine		
Pinus thunbergii Bitteenerum tehire	Japanese Black Pine		
Pittosporum tobira	Pittosporum Willow Oak		
Quercus phellos	Catawba Azalea		
Rhododendron catawbiense			
Rhododendron indica	Formosa/Indica Azalea Kurume Azalea		
Rhododendron obtusum			
Taxus cuspidata	Yew Globe Arborvitae		
Thuja occidentalis			.>>>>
Tsuga canadensis	Hemlock		, , , , , , , , , , , , , , , , , , ,
Viburnum spp.	Viburnum		, , , , , , , , , , , , , , , , , , , ,
<i>Yucca</i> spp.	Yucca		,,,,,,,
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Field- and Liner*-Grown Plants and Plants in Landscape Plantings

*Plants transplanted normally in rows in a nursery or similar area for further growth before transplanting to final growing location (place of establishment).

Scientific Name	Common Name/Variety	·····	
Abelia spp.	Glossy Abelia		
Abies spp.	Fir		
Acer spp.	Maple		
Achillea spp.	Yarrow		-
Agapanthus africanus	African Lily		
Ageratum spp.	Blue Ageratum		•
Ajuga reptans	Ajuga		
Allium spp.	Allium		
Allyssum spp.	Allyssum	- -	
Antirrhinum majus	Snapdragon		•
Aquilegia spp.	Columbine	_	
Artemesia stoleriana	Dusty Miller	-	
Asclepias spp.	Milkweed		
Aster spp.	Aster -		
Aucuba spp.	Aucuba		•
<i>Berberis</i> spp.	Barberry		
Betula spp.	Birch	-	
<i>Bougainvillea</i> spp.	Bougainvillea		
<i>Buxus</i> spp.	Boxwood		
Camellia spp.	Camellia		
Campanula carpatica	Bellflower		•
Canna indica	Canna Lily	-	
Carex spp.	Carex		
Chrysanthemum spp.	Chrysanthemum, Daisy	-	
Citrus spp.**	Citrus		
Coreopsis spp.	Coreopsis		• • ·• · · ·
Cornus spp.	Dogwood		
Cortaderia selloana	Pampas Grass		
Cotoneaster spp.	Cotoneaster		
Crocus spp.	Crocus		
Cryophytum crystallium	Ice Plant		
Cytisus racemosus	Sweet Broom		
Daucus carota	Queen Anne's Lace		
<i>Delphinium</i> spp.	Delphinium		
Dianthus barbatus	Sweet William		
Eleagnus spp.	Eleagnus		د ر د د د ر
Endymion spp.	Endymion		د د د د د د
Escallonia fradesii	Escallonia		
Euonymus spp.	Euonymus	د د د د د د د د د د د	1
Ficus spp.	Fig		د در اد ار د د و
Forsythia spp.	Forsythia	<u>ر د</u> د د د د د د	
Fraxinus spp.	Ash		د ۲۰۰۶ ۲۰۰۶ ۲۰۰۶
Gaillardia spp.	Gaillardia	د د د د د د د د د د د	>
Gardenia jasminoides	Gardenia		د د د د د د د د
Gazania splendoens	Gazania Gold Rush	-	آ د د دُ ر
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Gelsemium sempervirens Geranium spp. Geum spp. Gingko biloba 👘 Gladiolus x hortulanus Gleditsia triacanthos Hedera spp. Hemerocallis spp. Hibiscus spp. Hosta Iancifolia Hyacinthus spp. Hydrangea spp. Hypericum spp. llex spp. Illicium spp. Impatiens spp. Iris spp. Jasmine spp. Juniperus spp. Kalmia spp. Lagerstroemia spp. Leucothoe spp. Ligustrum spp. Lilium spp. Liquidambar spp. Liriodendron tulipifera Liriope spp. Lonicera spp. Lupinus spp. Lythrum spp. Magnolia spp. Malus spp.' Mesembryanthemum crystallinum Morea spp. Muscari armeniacum Myrica spp. Nandina domestica Narcissus spp. Nerium oleander Oenothera spp. Ophiopogon japonicus Ornithogalum umbellatum Osmanthus spp. Pachysandra spp. Pelargonium x hortorum Petunia spp. Phlox spp. Photinia spp. Physocarpus spp. Physostegia spp. Picea spp. Pieris japonica Pinus spp. Pittosporum spp.

Carolina Jessamine – Geranium Geum Gingko Gladiolus Honey Locust English Ivy Davlily Hibiscus Hosta Hvacinth Hydrangea St. John's Wort Holly Spicebush Impatiens ' Iris Jasmine Juniper Kalmia Crepe Myrtle Leucothoe Privet Lilv Sweetgum Tulip Tree Liriope Honeysuckie Lupines Loosestrife Magnolia Crabapple, Apple Ice Plant Fortnight Lily Muscari Wax Myrtle Bamboo Narcissus Oleander Primrose Mondo Grass Star of Bethlehem Osmanthus Pachysandra Geranium Petunia Phlox Photinia Ninebark Physostegia Spruce Japanese Andromeda Pine Pittosporum



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Podocarpus spp. Populus spp. Potentilla spp. Prunus spp.** Pseudotsuga menziesii Pyracantha spp. Pγ*rus* spp.** Quercus spp. Raphiolepis spp. Rhododendron spp. Robinia spp. Rosa spp. Rumohra adiantiformis Salix spp. Scilla spp. Sedum spp. Senecio doronicum Spiraea spp. Stachys spp. Statice sinnata Symphoricarpos spp. Syringa spp. Tagetes spp. Taxodium distichum Taxus spp. Ternstoemia gymanathera Thuja spp. Tsuga spp. Tulipa spp. *Veronica* spp. Viburnum spp. Vinca spp. Viola x Wittrockiana Washingtonia robusta Weigela spp. Wisteria senensis Yucca spp. Zinnia spp.

Podocarpus Poplar Potentilla (Cinquefoil) Cherry Douglas Fir Firethom Pear Oak Indian Hawthome Rhododendron/Azalea Locust Rose Leatherleaf Fem Willow Scilla Stone Crop Leopard's-bane Spiraea -Stachys **Annual Statice** Snowberry Lilac Marigold Bald Cypress Yew Cleyera Arborvitae Hemlock Tulip Veronica Viburnum Periwinkle Pansy Mexican Fan Palm Weigela Wisteria Yucca

**Do not apply to trees or plants that will bear harvestable fruit within 12 months, or illegal residues may result.

Zinnia

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Pennant Liquid may be applied in tank mixtures with Goal®, Princep, Ronstar®, Roundup®, or other compatible herbicides registered for use on ornamentals. Refer to the respective product labels for weeds controlled and for plants on which they are registered for use. When applying Pennant Liquid in tank mixtures, observe the more restrictive directions for use, precautions, and limitations on this label or the respective tank mix product label.

TURFGRASS

Warm Season Grasses (Bermudagrass, Centipedegrass, St. Augustinegrass, Bahiagrass, and Zoysiagrass)

Do not use Pennant Liquid on turfgrasses in New York State.

Apply Pennant Liquid **before weeds emerge**. Since soil moisture is necessary to activate Pennant Liquid, irrigate with 1/2 inch of water if rainfall does not occur within 7 days after treatment (See following Precautions).

Weeds Controlled

Scientific Name	Common Name	Rate of Pennant Liquid	
Cyperus compressus	Annual sedge	4 pts./A	
Cyperus esculentus	Yellow nutsedge	4 pts./A	
Digitaria ischaemum	Smooth crabgrass	4 pts./A	
Digitaria sanguinalis	Large crabgrass	4 pts./A	
Leptochloa fascicularis	Bearded sprangletop	2-4 pts./A	
Leptochloa uninervia	Mexican sprangletop	2-4 pts./A	
	Annual bluegrass	-2-4 pts./A	

*2 pts./A = 22 ml/1,000 sq. ft.

4 pts./A = 43 ml/1,000 sq. ft.

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Note: To minimize potential turf injury, do not apply more than once per year.

Commercial St. Augustinegrass Sod Production

Apply Pennant Liquid **before weeds emerge**. Since soil moisture is necessary to activate Pennant Liquid, irrigate with 1/2 inch of water if rainfall does not occur within 7 days after treatment (See following Precautions).

Weeds Controlled

Scientific Name	Common Name	Rate of Pennant Liquid*		
Cyperus compressus	Annual sedge	4 pts./A		
Cyperus esculentus	Yellow nutsedge	4 pts./A		
Digitaria ischaemum	Smooth crabgrass	4 pts./A		
<u>مرجعه المرجع المرجع</u>	Large crabgrass	4 pts./A		
Leptochloa fascícularis	Bearded sprangletop	2-4 pts./A		
Leptochloa uninervia	Mexican sprangletop	2-4 pts./A		
Poa annua	Annual bluegrass	2-4 pts./A		

*2 pts./A = 22 ml/1,000 sq. ft.

4 pts./A = 43 ml/1,000 sq. ft.

Notes: (1) Do not apply more than once every six weeks. (2) Do not apply more than a total of 8 pts./A per year.

Precautions for all uses on turf: Temporary slowing of growth and yellowing may occur following application. To avoid turf injury, (1) use only on turfgrass not under stress from infestations of insects, nematodes, or diseases; (2) do not use on golf greens, tees, or aprons; (3) do not apply over the rooting area of trees or ornamentals not listed on this label; (4) do not seed or overseed with desirable turfgrass 4 months before or 6 months after treatment, and (5) do not apply this product to newly seeded grasses until they have overwintered and have a well-developed rhizome system. (6) Before using Pennant Liquid in the tank mix with fluid fertilizer or other registered pesticides, determine the tolerance of the turf species by applying the combination to a limited area during a period of active growth. (7) In turfgrass areas which have heavy thatch, the weed control of Pennant Liquid may be reduced.

Note: To avoid possible illegal residues, do not graze or feed turf clippings to animals.

STORAGE AND DISPOSAL

Pesticide Disposal

Do not contaminate water, food, or feed by storage or disposal. Open the dumping is prohibited. Wastes resulting from the use of this product are toxic. Improper disposal of unused pesticide, spray mixture, or rinsate is toxic a violation of federal law. Pesticide, spray mixture, or rinsate that bannot be used according to label instructions must be disposed of according to the toxic federal, state, or local procedures. For guidance in proper disposal methods, contact your State Pesticide or Environmental Control Agency, or the toxic of the toxi

Hazardous Waste Representative at the nearest EPA Regional Office.

Container Disposal

Do not reuse empty container. Triple rinse (or equivalent), puncture and dispose of in a sanitary landfill, or by incineration, or by open burning, if allowed by state and local authorities. Keep out of smoke from burning containers.

This product may be stored at temperatures down to 30 degrees below 0°F.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

PRECAUTIONARY STATEMENTS

- Hazards to Humans and Domestic Animals

CAUTION

Causes moderate eye irritation. Harmful if swallowed or absorbed through the skin. Avoid contact with skin, eyes, or clothing. This product may cause skin sensitization reactions in some people.

Statement of Practical Treatment

If in eyes: Flush eyes with plenty of water. Get medical attention if irritation persists.

If swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

If on skin: Wash with plenty of soap and water. Get medical attention if irritation persists.

Note to Physician: If swallowed, there is no specific antidote. Induce emesis or lavage stomach. Treat symptomatically. Administration of an aqueous slurry of activated charcoal can be considered.

Personal Protective Equipment

Some materials that are chemical-resistant to this product are listed below If you want more options, follow the instructions for Category H on an EPA chemical resistance category selection chart

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves, such as barrier laminate or viton
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water Keep and wash PPE separately from other laundry

Engineering Control Statements

Mixers and loaders supporting aerial applications are required to use closed systems The closed system must be used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170 240(d)(4)] When using the closed system, the mixers' and loaders' PPE requirements may be reduced or modified as specified in the WPS

When handlers use closed systems, enclosed cabs, or aircraft 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 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

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Environmental Hazards

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

Ground Water Advisory

This chemical is known to leach through soil into ground water 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 ground water contamination.

Surface Water Advisory

Metolachlor can contaminate surface water through ground spray drift. Under some conditions, metolachlor may also have a high potential for runoff into surface water (primarily via dissolution in runoff water), for several months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas over-laying extremely shallow ground water, areas within-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas over-laying tile drainage systems that drain to surface water.

Mixing/Loading Instructions

Care must be taken when using this product to prevent back-siphoning into wells, spills, or improper disposal of excess pesticide, spray mixtures, or rinsates.

Check-valves or antisiphoning devices must be used on all mixing and/or irrigation equipment.

This product may not be mixed or loaded within 50 ft. of perennial or intermittent streams and rivers, natural or impounded lakes and reservoirs. This product may not be mixed/loaded or used within 50 ft. of all wells, including abandoned wells, drainage wells, and sink holes. Operations that involve mixing, loading, rinsing, or washing of this product into or from pesticide handling or application equipment or containers within 50 ft. of any well are prohibited unless conducted on an impervious ''' pad constructed to withstand the weight of the heaviest load that may be '''' positioned on or moved across the pad. Such a pad shall be designed and maintained to contain any product spills or equipment leaks, ','' container or equipment rinse or wash water, and rain water that may fall on the pad. Surface water shall not be allowed to either flow over of from ''', the pad, which means the pad must be self-contained. The pad shall be of sufficient capacity to contain at a minimum 110% of the capacity of the largest ''''

pesticide container or application equipment on the pad. A pad that is covered by a roof of sufficient size to completely exclude precipitation from contact with the pad shall have a minimum containment capacity of 100% of the capacity of the largest pesticide container or application equipment on the pad. Containment capacities as described above shall be maintained at all times. The above-specified minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading sites.

AAtrex®, Pennant®, and Princep® trademarks of Novartis

Agsorb® trademark of Oil-Dri Corporation

Compex® trademark of KALO Agricultural Chemicals, Inc

Goal® trademark of Rohm and Haas Company

Ronstar® trademark of Rhône-Poulenc Ag Company

Roundup® trademark of Monsanto Company

Unite® trademark of HACO, Inc

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Novartis Crop Protection, Inc Turf and Ornamental Products Greensboro, North Carolina 27419

NCP 96L1J 0797 - 1 gal NCP 96L6G 0797 - 1 qt NCP 96L7E 0797 - 4 fl. oz

This booklet manufactured using post-consumer, recycled paper



Revised	6/26/90
	Turf Uses
Revised	2/15/91
	zoysizgrass - add weed
1	species, containerized
	plants
Revised	10/3/91
	poa annua, Env. Hazards
Revised	3/20/92
,	All turf
Revised	8/4/93 - WPS
Revised	7/9/94 - Van Diest
	Est. # -
	drainback jug
Revised	7/97 - Name change to Novartis

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[QUARK/PENNANT/N-PENNANT-LIQ] - ccg - 12/2/97

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(CONTAINER LABEL)

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Pennant® Liquid

HERBICIDE

For weed control in nurseries, turf, and landscape plantings

 Active Ingredient:

 Metolachlor: 2-chloro-N-(2-ethyl-6-methylphenyl)

 N-(2-methoxy-1-methylethyl) acetamide

 Inert Ingredients:

 13.6%

 Total:

Pennant Liquid contains 8 lbs. active ingredient per gallon.

See directions for use in attached booklet.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

EPA Reg. No. 100-691

EPA Est. 42761-MS-1R

EPA Est. 5905-GA-01^H

EPA Est. 11773-IA-01W

(Superscript is first letter of lot number on jug) (gallon) (Superscript is first letter of lot number on bottle) (quart and 4 fl. oz.)

One Gallon U.S. Standard Measure

One Quart U.S. Standard Measure

4 fl. oz. U.S. Standard Measure

KEEP OUT OF REACH OF CHILDREN

CAUTION

Precautionary Statements

Hazards to Humans and Domestic Animals

Causes moderate eye irritation. Harmful if swallowed or absorbed through the skin. Avoid contact with skin, eyes, or clothing. This product may cause skin sensitization reactions in some people.

Statement of Practical Treatment

If in eyes: Flush eyes with plenty of water. Get medical attention if irritation persists.

If swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

If on skin: Wash with plenty of soap and water. Get medical attention if irritation persists.

Note to Physician: If swallowed, there is no specific antidote. Induce emesis or lavage stomach. Treat symptomatically. Administration of an aqueous slurry of activated charcoal can be considered.

Environmental Hazards

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

Ground Water Advisory

This chemical is known to leach through soil into ground water 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 ground water contamination.

Surface Water Advisory

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Metolachlor can contaminate surface water through ground spray;drift. Under some conditions, metolachlor may also have a high potential for runoff into surface water (primarily via dissolution in runoff water), to several months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently

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flooded areas, areas over-laying extremely shallow ground water, areas within-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas over-laying tile drainage systems that drain to surface water

Mixing/Loading Instructions

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Care must be taken when using this product to prevent back-siphoning into wells, spills, or improper disposal of excess pesticide, spray mixtures, or rinsates

Check-valves or antisiphoning devices must be used on all mixing and/or irrigation equipment

This product may not be mixed or loaded within 50 ft. of perennial or intermittent streams and rivers, natural or impounded lakes and reservoirs. This product may not be mixed/loaded or used within 50 ft. of all wells, including abandoned wells, drainage, and sink holes*.

*For exceptions to this restriction, see the Environmental Hazards section of the Precautionary Statements in attached booklet

Aerial Drift Management Requirements

Do not apply this product by air unless the supplemental labeling on **Aerial Drift Management** in attached booklet is followed

Chemigation

Refer to supplemental labeling in attached booklet for use directions for chemigation. Do not apply this product through any irrigation system, unless the supplemental labeling on chemigation is followed

Container Disposal

Do not reuse empty container Triple rinse (or equivalent), puncture and dispose of in a sanitary landfill, or by incineration, or by open burning, if allowed by state and local authorities Keep out of smoke from burning containers

This product may be stored at temperatures down to 30 degrees below 0°F

Pennant® trademark of Novartis

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Novartis Crop Protection, Inc Turf and Ornamental Products Greensboro, North Carolina 27419

NCP 96L1J 0797 - 1 gal.

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NCP 96L6G 0797 - 1 qt

NCP 96L7E 0797 - 4 fl. oz

[QUARK/PENNANT/N-PENNANT-LIQ] - ccg - 12/2/97