ARSENAL® herbicide

ACTIVE	INCRED:	FNT.
LOTIAL.	A CORED.	LEMI

EPA Reg. No. 241-273

EPA Est. No.

ACCEPTED

Under the Federal Insecticide, Fungicide, and Rodenficide Act, as amended for the pesicide registered under EPA Reg. Na. 113

KEEP OUT OF REACH OF CHILDREN CAUTION!

PRECAUCION

PRECAUCION AL USUARIO:

Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente

In case of emergency endangering life or property involving this product, call collect, day or night, Area Code 201-835-3100.

See next page for Additional Precautionary Statements

AMERICAN CYANAMID COMPANY AGRICULTURAL DIVISION VPC VENTURES WAYNE, NJ 07470[©]1989

Net Contents:

Registered Trademark of American Cyanamid Company

4/12/89

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS

CAUTION!

Avoid contact with skin, eyes or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

FIRST AID

IF ON SKIN: Wash with plenty of soap and water.

IF IN EYES: Flush with plenty of water. Get medical attention if irritation persists.

PHYSICAL AND CHEMICAL HAZARDS

Spray solutions of ARSENAL should be mixed, stored and applied only in stainless steel, fiberglass, plastic and plastic-lined steel containers.

DO NOT mix, store or apply ARSENAL or spray solutions of ARSENAL in unlined steel (except stainless steel) containers or spray tanks.

ENVIRONMENTAL HAZARDS

DO NOT apply directly to water or wetlands. DO NOT contaminate water when disposing of equipment washwaters.

IMPORTANT .

DO NOT use on food or feed crops. DO NOT treat irrigation ditches. Keep from contact with fertilizers, insecticides, fungicides and seeds. DO NOT apply or drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots. DO NOT use on lawns, walks, driveways, tenn s courts, or similar areas. DO NOT side trim desirable vegetation with this product. Prevent drift of spray to desirable plants. DO NOT USE in California.

Clean application equipment after using this product by thoroughly flushing with water.

.

GENERAL INFORMATION

ARSENAL herbicide is an aqueous solution containing surfactant to be mixed in water and applied as a spray for control of most annual and perennial grasses and broadleaf weeds on noncropland areas.

ARSENAL may be applied either preemergence or postemergence to the weeds; however, postemergence application is the method of choice in most situations, particularly for control of perennials. For maximum activity, weeds should be growing vigorously at the time of postemergence applications. The preemergence activity of ARSENAL will provide residual control of new germination of most weed species following a postemergence application.

ARSENAL is readily absorbed through foliage and roots and is translocated rapidly throughout the plant, with accumulation in the meristematic regions. Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into and kills underground storage organs, thus preventing regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until two weeks after application. Complete kill, of plants may not occur for several weeks.

DISCLAIMER

The label instructions for the 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. Ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the use or application of the product contrary to label instructions, all of which are beyond the control of American Cyanamid Company. All such risks shall be assumed by the user.

American Cyanamid Company warrants only that the material contained herein conforms to the chemical description on the label and is reasonably fit for the use therein described when used in accordance with the directions for use, subject to the risks referred to above.

Any damages arising from a breach of this warranty shall be limited to direct damages and shall not include consequential commercial damages such as loss of profits or values or any other special or indirect damages.

American Cyanamid Company makes no other express or implied warranty, including other express or implied warranty of FITNESS or of MERCHANTABILITY.

DIRECTIONS FOR USE

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

ARSENAL herbicide should be used only in accordance with recommendations on the leaflet label attached to the container. Keep containers closed to avoid spills and contamination.

A postemergence use of ARSENAL is recommended for control of most annual and perennial grasses and broadleaf weeds on noncropland areas such as railroad, utility, pipeline and highway rights-of-way, utility plant sites, petroleum tank farms, pumping installations, fence rows, storage areas, non-irrigation ditchbanks, and other similar areas. ARSENAL is recommended for the establishment and maintenance of wildlife openings. ARSENAL may also be used for the release of unimproved bermudagrass (see specific labeling).

STORAGE AND DISPOSAL

-4-

PROHIBITIONS:

DO NOT store below 10 degrees F.

DO NOT contaminate water, food or feed by storage or

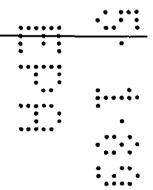
disposal.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal

facility.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in an approved sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay

out of smoke.



FOR CONTROL OF UNDESTRABLE WEEDS IN UNIMPROVED BERMUDAGRASS AND BAHIAGRASS

For use on unimproved bermudagrass and bahiagrass turf such as roadsides, utility rights-of-way and other non-cropland industrial sites. The application of ARSENAL on established common and coastal bermudagrass and bahiagrass provides control of labeled broadleaf and grass weeds. Competition from these weeds is eliminated, releasing the bermudagrass and bahiagrass. Treatment of bermudagrass with ARSENAL results in a compacted growth habit and seedhead inhibition.

Uniformly apply with properly calibrated ground equipment using at least 10 gallons of water per acre with a spray pressure 20 to 50 psi.

DOSAGE RATES AND TIMING

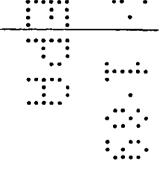
EARLY SPRING - DORMANT: Apply ARSENAL at 6 to 12 fluid oz. per acre for bermudagrass, and 4 to 8 fluid oz. per acre for bahiagrass when the grass is still dormant and has not initiated new growth.

SPRING - UP TO 25% GREEN-UP: Apply ARSENAL at 6 to 8 fluid oz. per acre for bermudagrass and 4 to 8 fluid oz. per acre for bahiagrass after the grass has initiated green-up but has not exceeded 25% green-up.

WEEDS CONTROLLED

Bedstraw (Galium spp.)
Bishopweed (Ptilimnium capillaceum)
Buttercup (Ranunculos parviflorus)
Carolina geranium (Geranium carolinianum)
Fescue (Festuca spp.)
Foxtail (Setaria spp.)
Little barley (Hordeum pusillum)
Seedling Johnsongrass (Sorghum halepense)
Wild carrot (Daucus carota)
White clover (Trifolium repens)
Yellow woodsorrel (Oxalis stricta)

- DO NOT APPLY to grass during its first growing season.
- DO NOT APPLY to grass that is under stress from drought, disease, insects, or other causes.
- Temporary yellowing of grass may occur when treatment is made after growth commences.
- 4. DO NOT add a surfactant.



APPLICATION EQUIPMENT AND TECHNIQUES

ARSENAL herbicide may be applied with the following application equipment:

Aerial: fixed wing and helicopter.

ĺ

Boom: conventional boom mounted, manifold mounted, and off-center nozzles.

Low-volume hand-held spray equipment: backpack, knapsack and other pump-up type pressure sprayers and backpack mist blowers used to direct application to weed foliage.

High-volume spray equipment: high pressure handguns and vehicle mounted high-volume directed spray equipment.

AERIAL EQUIPMENT

Uniformly apply the recommended amount of ARSENAL with properly calibrated aerial equipment in 5 to 30 gallons of water per acre. All precautions should be taken to minimize or eliminate spray drift. Aerial equipment designed to minimize spray drift, such as a helicopter equipped with a MICROFOIL boom, THRU-VALVE boom or raindrop nozzles, must be used. Applications should not be made under gusty conditions or when wind velocity exceeds 5 mph. Except when applying with a MICROFOIL boom, a drift control agent may be added at the recommended label rate. A foam reducing agent may be added at the recommended label rate, if needed.

IMPORTANT: DO NOT make applications by fixed wing aircraft unless appropriate buffer zones can be maintained to insure that drift does not occur off the target area. Thoroughly clean application equipment, including landing gear, immediately after use. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part.

BOOM EQUIPMENT

Mix the recommended amount of ARSENAL in 10 to 60 gallons of water per acre in the spray tank with the agitator running. A foam reducing agent may be added at the recommended label rate, if needed. If desired, a spray pattern indicator may be added at the recommended label rate. Check for even distribution in spray pattern.

IMPORTANT: To minimize drift, select proper nozzles to avoid spraying a fine mist, DO NOT exceed spray pressure of 50 psi, and DO NOT spray under windy or gusty conditions.

Clean application equipment after using this product by thoroughly flushing with water.

LOW-VOLUME HAND-HELD SPRAY EQUIPMENT

Thoroughly mix a 1/2 to 1 percent solution of ARSENAL in water. To determine the proper percent solution of ARSENAL to use, see the "WEEDS CONTROLLED" section of this label and the "PERCENT SOLUTION RATE GUIDE" below. The table calculations below are based on an approximate delivery volume of 50 to 75 gallons per acre.

PERCENT SOLUTION RATE GUIDE

PERCENT SOLUTION TO MIX	
1/2.0	
1/2 %	
3/4 %	
1 %	

For best results, uniformly cover the foliage of the vegetation to be controlled with the spray solution.

DO NOT overapply and cause runoff from the treated foliage.

To mix the spray solution, add the volume of ARSENAL indicated in the table below to the desired amount of water.

SPRAY SOLUTION MIXING GUIDE

SOLUTION		T OF ARSENAL T fluid volume)	O USE	
VOLUME	1/2 %	3/4 \$	1 1	
l gallon	2/3 oz.	1 oz.	1-1/3 oz.	••••
5 gallons	3-1/3 oz.	5 oz.	6-1/2 oz.	:
0 gallons	6-2/3 oz.	10 oz.	13 oz.	
5 gallons	1 pint	1-1/2 pints	2 pints	

2 tablespoons - 1 fluid ounce

IMPORTANT: DO NOT exceed recommended dosage rate per acre. DO NOT side-trim desirable vegetation with this product. Clean application equipment after using this product by thoroughly flushing with water.

HIGH-VOLUME SPRAY EQUIPMENT

ARSENAL may be applied using high-volume spray equipment. For best results, apply ARSENAL using the least amount of water practical to obtain uniform coverage of the vegetation foliage. Using excessive spray volumes which cause runoff from the plant foliage may result in reduced performance.

When using spray volumes greater than 60 gallons per acre, additional nonionic surfactant such as Ortho* X-77 must then be added at the rate of 1 quart per 100 gallons of spray solution to provide optimum wetting and/or contact activity. A foam reducing agent may be added at the recommended label rate, if needed. If desired, a spray pattern indicator may be added at the recommended label rate.

To mix the spray solution, determine the proper ARSENAL pints per acre rate from the "WEEDS CONTROLLED" section of this label and mix according to the table below.

SPRAY SOLUTION MIXING GUIDE

RAY VOLUME	PINTS A	ARSENAL TO MIX	PER 100 GALLONS	WATER
(GAL/ACRE)	3 PTS/ACRE	4 PTS/ACRE	5 PTS/ACRE	6 PTS/ACRE
50	6	8 ,	10	12
100	3	4	5	6
150	2	2-3/4	3-1/4	4

IMPORTANT: DO NOT exceed recommended dosage rate per acre. DO NOT side-trim desirable vegetation with this product. Clean application equipment after using this product by thoroughly flushing with water.

^{*}Registered Trademark of Chevron Chemical Company

FOR CONTROL OF UNDESIRABLE WEEDS UNDER PAVED SURFACES

ARSENAL herbicide can be used under asphalt, pond liners and other paved areas, ONLY in industrial sites or where the pavement has a suitable barrier along the permimeter that prevents encroachment of roots of desirable plants.

ARSENAL should be used only where the area to be treated has been prepared according to good construction practices. If rhizomes, stolons, tubers or other vegetative plant parts are present in the site, they should be removed by scalping with a grader blade to a depth sufficient to insure their complete removal.

APPLICATION DIRECTIONS

Applications should be made to the soil surface only when final grade is established. Do not move soil following ARSENAL application.

Uniformly apply ARSENAL to the area to be surfaced, including the shoulder areas at a rate of 6 pts. per acre.

Apply ARSENAL in sufficient water (at least 100 gal.; r acre) to insure thorough wetting of the soil surface. Add the recommended amount of ARSENAL to clean water in the spray tank during the filling operation. Agitate before spraying.

For Herbicide Activation:

On Moist Subsoils: Apply ARSENAL after final grading and immediately before laying asphalt or liner surface. Apply uniformly, using at least 100 gallons of water per acre.

If Moisture Is Not Present: Incorporation of ARSENAL is needed for herbicide activation. ARSENAL can be incorporated into the soil to a depth of 4 to 6 inches using a rototiller or disc. Rainfall or irrigation of 1 inch will also provide uniform incorporation. Do not allow treated soil to wash or move into untreated areas.

IMPORTANT

Paving should follow ARSENAL applications as soon as possible DO NOT apply where the chemical may contact the roots of desirable trees or other plants.

The product is not recommended for use under pavement on residential properties such as driveways or parking lots, nor is it recommended for use in recreational areas such as under bike or jogging paths, golf cart paths, or tennis courts, or where landscape plantings could be anticipated.

7.1.1

Injury or death of desirable plants may result if this product is applied where roots are present or where they may extend into the treated area. Rests of trees and shrubs may extend a considerable distance beyond the branch extremities or so called drip line.

WEEDS CONTROLLED

ARSENAL herbicide will provide postemergence control with residual control of the following target vegetation species at the rates listed. Residual control refers to control of newly germinating seedlings in both annuals and perennials. In general, annual weeds may be controlled by postemergence or preemergence applications of ARSENAL; whereas, for established biennials and perennials postemergence applications of ARSENAL are recommended. ARSENAL herbicide should be used only in accordance with the recommendations on this label and the leaflet label.

GRASSES

Apply 2-3 pints per acre1

COMMON NAME	SPECIES	GROWTH HABIT ²
Annual bluegrass	(<u>Poa</u> annua)	A
Broadleaf signalgrass	(Brachiaria platphylla)	A
Canada bluegrass	(<u>Poa compressa</u>)	P
Downy brome	(Bromus tectorum)	A
Fescue	(<u>Festuca</u> spp.)	A/P
Foxtail	(<u>Setaria</u> spp.)	A
Italian ryegrass	(Lolium multiflorum)	A
Johnsongrass	(Sorghum halepense)	Þ
Ken ucky bluegrass	(<u>Poa pratensis</u>)	P
Lovegrass	(<u>Eragrostis</u> spp.) :	A/P
Orchardgras s	(<u>Dactylis</u> <u>glomerata</u>)	P
Paragrass	(Brachiaria mutica)	P
Quackgrass	(Agropyron repens)	P
Sandbur	(Cenchrus :pp.)	A ,
Sand dropseed	(Sporobulus cryptandrus)	A
Smooth brome	(Bromus inermis)	P 1
Vaseygr ass	(<u>Paspalum urvillei</u>)	P
Wild oats	(<u>Avena fatua</u>)	A ,
Witchgrass	(Panicum capillare)	A
	Apply 3-4 pints per acrel	
Beardgrass	(Andropogon spp.)	Ρ ',
Cheat	(<u>Bromus secalinus</u>)	A
Crabgrass	(<u>Digitaria</u> spp.)	A
Fall panicum	(Panicum dichotomiflorum)	A
Goosegrass	(Eleusine indica)	A
Prairie threeawn	(Aristida oligantha)	P
Reed canarygrass	(Phalaris arundinacea)	P

Torpedograss	(<u>Panicum repens</u>)	P
Wild barley	(Hordeum spp.)	A
	Apply 4-6 pints per acrel	
	(7)	ħ
Bahiagrass	(<u>Paspalum notatum</u>)	P
Bermudagrass	(<u>Cynodon dactylon</u>)	P
Big bluestem	(<u>Andropogon geradi</u>)	P
Cattail	(<u>Typha</u> spp.)	P
Cogongrass	(<u>Imperata cylindrica</u>)	P
Dallisgrass	(<u>Paspalum</u> <u>dilatatum</u>)	P
Feathertop	(<u>Pennisetum</u> <u>villosum</u>)	P
Guineagrass	(<u>Panicum maximum</u>)	P
Phragmites	(<u>Phragmites australis</u>)	P
Prairie cordgrass	(<u>Spartina pectinata</u>)	P
Saltgrass	(<u>Distichlis</u> <u>stricta</u>)	P
Sand dropseed	(Sporobolus cryptandrus)	P
Timothy	(<u>Phleum pratense</u>)	P
Wirestem muhly	(<u>Muhlenbergia</u> <u>frondosa</u>)	P

BROADLEAF WEELS

Apply 2-3 pints per acrel

		ъ
Burdock	(<u>Arctium</u> spp.)	В
Camphorweed	(<u>Heterotheca</u> <u>subaxillaris</u>)	P
Carpetweed	(<u>Mullugo</u> <u>verticillata</u>)	A
Carolina geranium	(<u>Geranium carolinianum</u>)	Α
Clover	(<u>Trifolium</u> spp.)	A/P
Common chickweed	(<u>Stellaria media</u>) ,	Α
Common ragweed	(<u>Ambrosia</u> artemislifolia)	Α
Dandelion	(<u>Taraxacum officinale</u>)	P
Dogfennel	(Eupatorium capillifolium)	A
Filaree	(<u>Erodium</u> spp.)	Α
Fleabane	(Erigeron spp.)	A :
Hoary vervain	(<u>Verbena stricta</u>)	P
Horseweed	(Conyza canadensis)	A
Indian mustard	(<u>Brassica juncea</u>)	A
Kochia 3	(<u>Kochia</u> <u>scoparia</u>)	A
Lambsquarters	(Chenopodium album)	A
Lespedeza	(<u>Lespedeza</u> spp.)	P
Mirers lettuce	(<u>Montia perfoliata</u>)	A
Mullein	(<u>Verbascum</u> spp.)	В
Nettleleaf goosefoot	(Chenopodium murale)	Α
Oxeye daisy	(Chrysanthemum leucanthemum)	P
Pepperweed	(Lepidium spp.)	A
Pigweed	(Amaranthus spp.)	A
Plantain	(Plantago spp.)	P

Puncturevine Russian thistle Smartweed Sorrell Sunflower Sweet clover Tansymustard Western ragwee1 Wild carrot	(Tribulus terrestris) (Salsola kali) (Polygonum spp.) (Rumex spp.) (Helianthus spp.) (Melilotus spp.) (Descurainia pinnata) (Ambrosia psilostachya) (Daucus carota)	A A/P P A A/B A P B
Wild lettuce	(<u>Lactuca</u> spp.) (<u>Pastinaca sativa</u>)	A/B B
Wild parsnip Wild turnip	(Brassica campestris)	В
Woollyleaf bursage	(<u>Franseria tomentosa</u>)	P
Yellow woodsorrel	(Oxalis stricta)	P
	Apply 3-4 pints per acrel	
Brcom snakeweed ³	(Gutierrezia sarothrae)	P
Bull thistle	(Cirsium volgare)	В
Cocklebur	(Xanthium strumarium)	A
Desert Camelthorn	(Alhagi pseudalhagi)	P
Diffuse knapweed	(Centaurea diffusa)	A P
Dock Goldenrod	(<u>Rumex</u> spp.) (<u>Solidago</u> spp.)	P P
Pokeweed	(<u>Phytolacca americana</u>)	P
Purple loosestrife 3	(Lythrum salicaria)	P
Purslane	(Portulaca spp.)	Ā
Rush skeletonweed 3	(Chondrilla junces)	В
Saltbush	(Atriplex spp.)	A
Stinging nettle ³	(Urtica dioica)	P
Yellow starthistle	(Centaurea solstitialis)	A
	Apply 4-6 pints per acrel	
Arrowwood	(<u>Pluchea sericea</u>)	A
Canada thistle	(Cirsium arvense)	P
Giant ragweed	(Ambrosia trifida)	A
Grey rabbitbrush	(Chrysothamnus nauseosus)	P
Japanese bamboo	(Polygonum cuspidatum)	P
Little mallow	(Malva parviflora)	В
Milkweed	(<u>Asclepias</u> spp.)	P
Primrose	(Oenothera kunthiana)	P
Russian knapweed	(Centaurea repens)	P
Silverleaf nightshade	(Solanum elaeagnifolium)	P
Sowthistle Texas thistle	(Sonchus spp.)	A P
Texas Chiscie	(<u>Cirsium texanum</u>)	r
	VINES AND BRAMBLES	
	Apply 1 pint per acre	
Field bindweed	(Convolvulus arvensis)	P
Hedge bindweed	(<u>Calystegia sequium</u>)	A

Apply 2-3 pints per acre1

Wild buckwheat	(Polygonum convolvulus)	P
	Apply 3-4 pints per acrel	
	(<u>Smilax</u> spp.) (<u>Lonicera</u> spp.) (<u>Ipomoea</u> spp.) (<u>Rhus radicans</u>) (<u>Brunnichia cirrhosa</u>) (<u>Rosa</u> spp.) a rose (<u>Rosa multiflora</u>) rose (<u>Rosa bractreata</u>)	P P A/P P P
	Apply 4-6 pints per acre1	
Blackberry 4 Dewberry 4 Kudzu 5 Trumpetcreeper Virginia creeper Wild grape	(Rubus spp.) (Rubus spp.) (Pueraria lobata) (Campsis radicans) (Parthenocissus quinquefolia) (Vitis spp.)	P P P P
	BRUSH SPECIES Apply 4-6 pints per acrel	
American beech Ash Bald cypress Bigleaf Maple Blackgum Boxelder	(Fagus grandifolia) (Fraxinus spp.) (Taxodium distichum) (Acer macrophylum) (Nyssa sylvatica) (Acer negundo)	P P P P
Cherry Chinaberry Chinese tallow-tree Dogwood Hawthorn	(Prunus spp.) (Melia azadarach) (Sapium sebiferum) (Cornus spp.) (Crataegus spp.)	P P P P
Hickory Maple Mulberry Oak Persimmon	(<u>Carya</u> spp.) (<u>Acer</u> spp.) (<u>Morus</u> spp.) (<u>Quercus</u> spp.) (<u>Diospyros virginiana</u>)	P P P P
Poplar Privet	(Populus spp.) (Ligustrum vulgare)	P P

Russian Olive	(Eleagnus angustifolia)	P
Red Alder	(Alnus rubra)	P
Red Maple	(Acer rubrum)	P
Saltcedar	(<u>Tamarix ramosissima</u>)	P
Sassafras	(<u>Sassafras</u> <u>albidum</u>)	P
Sourwood	(Oxydendrum arboreum)	P
Sumac	(<u>Rhus</u> spp.)	P
Sweetgum	(Liquidambar styraciflua)	P
Willow	(<u>Salix</u> spp.)	P
Yellow poplar	(Liriodendron tulipifera)	P

 $^{^{}m 1}$ The higher rates should be used where heavy or well established infestations occur.

² Growth Habit - A - Annual, B - Biennial, P - Perennial

³ For best results early postemergence applications are required.

⁴ The degree of control is species dependent. Some Rubus species may not be completely controlled.

 $^{^{5}}$ Use a minimum of 75 GPA - Control of established stands may require repeat applications.