

1975

EC75-130 A 1975 Guide for Herbicide Use in Nebraska

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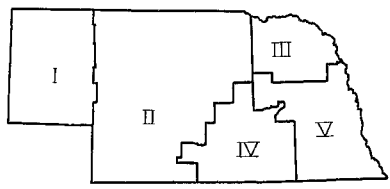
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HERBICIDE USE IN NEBRASKA...



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"Use Crop Production
Chemicals Wisely"

This circular deals principally with herbicides as an aid for crop production. The suggestions for use are based on results at Nebraska research stations and elsewhere. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

DO NOT USE 2,4-D ESTER, DICAMBA (BANVEL), AND SIMILAR HERBICIDES NEAR VEGETABLES, ORNAMENTALS, TREES, SHRUBS, AND BROADLEAF CROPS.

Genetic strains, varieties, and hybrids vary in their response to herbicides. Check with your seed dealer for information on the crop you plan to treat.

Extension work in "Agriculture, Home Economics and subjects relating thereto," The Cooperative Extension Service, Institute of Agriculture and Natural Resources, University of Nebraska—Lincoln, Cooperating with the Counties and the U. S. Department of Agriculture

J. L. Adams, Director

READ THE LABEL BEFORE EACH USE. Follow instructions; heed all cautions and warnings.

APPLY ONLY AS DIRECTED, to the crops specified, in amounts specified and at times specified. *Federal law authorizes seizure of any raw agricultural commodity moving in interstate commerce which carries a pesticide residue in excess of the established tolerance.*

STORE IN ORIGINAL, LABELED CONTAINERS. Keep out of reach of children, pets, livestock and irresponsible people.

ELIMINATE HAZARDS FROM CONTAINER. Rinse empties that contained liquids. Three rinsings remove most of the chemical. **BURN PAPER BAGS AND FIBER DRUMS.** Stay out of the smoke. Bury unused materials and crushed containers.

FIELD CROPS—PREPLANT AND PREEMERGENCE

Band applications reduce total herbicide used.

Preplant treatments are made before planting the crop. Preemergence treatments are applied from planting time to just before plant emergence. Postemergence treatments are applied after emergence of weeds or crop. Weed control with preemergence treatments may be poor if there is no rain to leach the herbicide into the top inch. To overcome dependence on rainfall and to increase dependability some preemergence herbicides may be incorporated into the surface soil with a suitable implement. Excessive rainfall may leach some of the more soluble herbicides into the subsoil, especially on sandy soils. Weed control with preemergence herbicides is more satisfactory on surface-

planted crops and when applied to prepared seedbeds free of clods, trash, and weeds.

Some weed species are resistant to particular herbicides. Herbicides should be rotated to control a wider spectrum of weeds and to reduce the build-up of any particular herbicide in the soil. *If you use atrazine plant only corn or sorghum the following year—it may carry over and injure alfalfa, beans, potatoes, sugar beets, and small grains.* Herbicide residue problems in soils increase as one goes westward in Nebraska.

Sprayers should provide good agitation of spray solution and be equipped with 50-mesh or coarser screens to avoid clogging with wettable powders.

Herbicide	Commercial product	Apply this amount of commercial product per acre			Application time	Remarks
		SANDY LOAM <1½% OM	SILT LOAM 1½-2½%	SILTY-CLAY LOAM >2½% OM		
CORN—Primarily Annual Grass Control						
alachlor	Lasso	3 qt	2½ qt	2½ qt	Preemergence	Deteriorates some synthetic equipment. Consult company brochure for resistant materials. Shallow incorporation with rotary hoe, mulch treader, or harrow beneficial.
	Lasso II (15G)	17 lb	17 lb	17 lb	Preemergence	
butylate	Sutan ⁺ 6.7	3½ pt	5 pt	5 pt	Preplant	Apply to dry surface soil. Incorporate immediately by cross tandem disking or equivalent soil mixing. Increase rates by 10% when Sutan ⁺ 6E formulation is used.
EPTC plus safener	Eptam 7E + "Protect" Seed Treatment	3½ pt	5 pt	5 pt	Preplant	Especially for shattercane and sand-bur control. Apply to dry surface soil. Immediately incorporate by double tandem disking. Increase rates if 6E formulations are used.
	Eradicane 6.7E	3½ pt	5 pt	5 pt	Preplant	
CORN—Annual Grass & Broadleaf Weed Control						
alachlor + atrazine	Lasso + AAtrex 80W	2 qt + 1¼ lb	2 qt + 1¼ lb	2 qt + 1¼ lb	Preemergence	Tank mix. Shallow incorporation with rotary hoe, mulch treader or harrow beneficial.
	or AAtrex 4L	1 qt	1 qt	1 qt		
	Bladex 80WP or Bladex 4	Do not use	3 lb or 2½ qt	4 lb or 3¼ qt		
atrazine	AAtrex 80W or AAtrex 4L	2 lb or 1.6 qt	2½ lb or 2 qt	3¾ lb or 3 qt	Preemergence or Preplant	Carryover may affect crops the following year. More serious on high pH soils.
alachlor + cyanazine	Lasso + Bladex 80WP	Do not use	2 qt + 1½ lb	2 qt + 2 lb	Preemergence	Crop injury may occur on sandy or low organic matter soil.
butylate + atrazine	Sutan ⁺ 6.7E + AAtrex 80W or AAtrex 4L	3¾ pt + 1¼ lb or 1 qt	3¾ pt + 1¼ lb or 1 qt	3¾ pt + 1¼ lb or 1 qt	Preplant	Tank mix. Apply to dry surface soil. Increase rate if Sutan ⁺ 6E is used. Incorporate immediately by cross tandem disking or equivalent soil mixing.
butylate + cyanazine	Sutan ⁺ 6.7E + Bladex 80WP	Do not use	3¾ pt + 1½ lb	3¾ pt + 2 lb	Preplant	Increase rate if Sutan ⁺ 6E is used. Apply to dry surface soil. Incorporate immediately by cross tandem disking or equivalent soil mixing. Sutan ⁺ + Bladex is a tank mix.

FIELD CROPS—PREPLANT AND PREEMERGENCE—(Continued)

Herbicide	Commercial product	Apply this amount of commercial product per acre			Application time	Remarks
		SANDY LOAM <1½%OM	SILT LOAM 1½-2½%	SILTY-CLAY LOAM >2½%OM		
propachlor + atrazine	Ramrod- AAtrex	Do not use	5 lb Ramrod- Atrazine 69WP or 22½ lb AAtram 20 G	5 lb Ramrod- Atrazine 69WP or 22½ lb AAtram 20 G	Preemergence	May cause irritation to applicator. Ramrod leaches on sandy soil.

SOYBEANS—Primarily Annual Grass Control

alachlor	Lasso Lasso II (15G)	3 qt 17 lb	2½ qt 17 lb	2½ qt 17 lb	Preemergence Preemergence	Deteriorates some synthetic equipment. Consult company brochure for resistant materials. Shallow incorporation with rotary hoe or harrow beneficial.
trifluralin	Treflan	1 pt	1½ pt	1½ pt	Preplant	Immediately incorporate by cross tandem disking or equivalent soil mixing. Do not follow with wheat on low organic matter soils.

SOYBEANS—Annual Grass and Broadleaf Weed Control

alachlor + linuron	Lasso + Lorox 50W	Do not use	2 qt + 2 lb	2 qt + 3 lb	Preemergence	See Remarks above for Lasso. Soybeans should be covered with 1¾" of soil.
alachlor + metribuzin	Lasso + Sencor or Lexone	Do not use	2 qt + ¾ lb ¾ lb	2 qt + 1 lb 1 lb	Preemergence	See Remarks above for Lasso. Soybeans should be covered with 1¾" of soil. May cause injury on calcareous soils.
chloramben	Amiben	Do not use	5 qt	6 qt	Preemergence	Shallow incorporation may be beneficial. Leaches readily with heavy rainfall.
trifluralin + overlay of metribuzin	Treflan + Sencor or Lexone	Do not use	1¼ pt ¾ lb ¾ lb	1½ pt 1 lb ¾ lb	Preplant Preemergence	Immediately incorporate Treflan by cross tandem disking or equivalent soil mixing. Plant soybeans 1¾" deep. Lexone or Sencor may cause injury on calcareous soils.
trifluralin + metribuzin	Treflan + Sencor	Do not use	1 pt + ¾ lb	1¼ pt + 1 lb	Preplant	Remarks above for Treflan + Sencor/Lexone apply to this treatment. Safety margin of Sencor reduced by "incorporation".

FIELDBEANS—Primarily Annual Grass Control

EPTC	Eptam 7E	4 pt	4 pt	4 pt	Preplant	Apply to dry surface soil. Immediately incorporate by cross tandem disking or equivalent soil mixing. Decrease rate if 7E formulation is used. Do not follow Treflan with fall seeded small grain.
EPTC + trifluralin	Eptam 7E + Treflan	1 qt + 1 pt	1 qt + 1 pt	1 qt + 1 pt	Preplant	

SORGHUM—Primarily Annual Grass Control

propachlor	Ramrod 65W	6 lb	6 lb	6 lb	Preemergence	Controls grass weeds only. May cause skin irritation to applicator. Do not feed treated forage to dairy animals.
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FIELD CROPS—PREPLANT AND PREEMERGENCE—(Continued)

Herbicide	Commercial product	Apply this amount of commercial product per acre			Application time	Remarks
		SANDY LOAM <1½%OM	SILT LOAM 1½-2½%	SILTY-CLAY LOAM >2½%OM		
SORGHUM—Annual Grass and Broadleaf Weed Control						
atrazine	AAtrex 80W or AAtrex 4L	Do not use	2½ lb 2 qt	3 lb 2.4 qt	Preplant or preemergence	Preplant applications should be made only on fine textured soils. Heavy rains may leach AAtrex and Lorox and cause injury to sorghum. Do not feed Ramrod treated forage to dairy animals.
propachlor + atrazine	Ramrod- Atrazine 69W	Do not use	5 lb	5 lb	Preemergence	
propachlor + linuron	Ramrod 65W + Lorox 50W	Do not use	3 lb + 1½ lb	3 lb + 2 lb	Preemergence	
SUGARBEETS—Primarily Annual Grass Control						
cycloate	Ro-Neet 6E Ro-Neet 10G	4 pt 30 lb	4½ pt 35 lb	5 pt 40 lb	Preplant Preplant	Immediately mix into dry soil with power incorporator 1 to 2 inches. Do not use on sandy soils below 1% in organic matter.

WEED RESPONSE TO SELECTED PREPLANT AND PREEMERGENCE HERBICIDES^a

Herbicide	annual morningglory	barnyard grass	black nightshade	cocklebur	crabgrass	fall panicum	foxtail	jimsonweed	kochia	lambsquarters	pigweed	ragweed	sandbur	shattercane	smartweed	sunflower	velvetleaf	wild buckwheat	Crop tolerance ^b
	Corn																		
AAtrex or Atrazine	E	G	E	G	F	P	G	E	E	E	E	E	F	P	E	E	E	E	E
Bladex	E	G	E	G	G	F	G	E	E	E	F	E	F	P	E	G	G	E	G
Eptam + Protect } or Eradicane }	G	E	E	P	E	E	E	P	F	G	G	F	E	G	P	P	P	E	G
Lasso	P	E	G	P	E	E	E	P	P	G	E	F	F	P	P	P	P	P	E
Lasso + Atrazine	G	E	E	F	G	G	E	F	E	E	E	E	F	P	G	G	G	G	E
Lasso + Bladex	G	E	E	F	E	E	E	F	E	G	G	E	F	P	G	F	F	G	G
Ramrod-Atrazine } or AAtram }	G	G	G	F	G	G	E	F	E	E	E	E	F	P	G	G	G	G	E
Sutan ⁺	F	E	G	P	E	E	E	P	P	G	G	F	E	G	P	P	P	F	E
Sutan ⁺ + Atrazine	G	E	E	F	E	G	E	G	E	E	E	G	G	F	G	F	G	G	E
Sutan ⁺ + Bladex	F	E	G	P	E	G	E	G	E	E	G	G	G	F	G	F	F	G	G
Sorghum																			
AAtrex or Atrazine	E	G	E	G	F	P	G	G	E	E	E	E	F	P	E	E	E	E	F
Ramrod	P	G	P	P	G	G	E	P	P	F	G	P	F	P	F	P	P	F	G
Ramrod-Atrazine	G	G	G	F	G	F	E	F	E	E	E	G	F	P	G	G	G	G	G
Ramrod + Lorox	P	G	G	F	G	G	E	F	F	G	E	G	F	P	G	F	F	G	G

WEED RESPONSE TO SELECTED PREPLANT AND PREEMERGENCE HERBICIDES—(Cont.)

Herbicide	annual morningglory	barnyard grass	black nightshade	cocklebur	crabgrass	fall panicum	foxtail	jimsonweed	kochia	lambsquarters	pigweed	ragweed	sandbur	shattercane	smartweed	sunflower	velvetleaf	wild buckwheat	Crop tolerance ^b
Soybeans																			
Amiben	P	G	G	P	G	G	G	P	G	G	G	G	F	P	G	P	F	F	G
Lasso	P	E	G	P	E	E	E	P	P	G	E	F	F	P	P	P	P	P	E
Lasso + Lorox	P	E	G	F	E	E	E	F	F	G	E	G	F	P	G	F	F	G	G
Lasso + Sencor or Lexone	P	E	G	F	E	E	E	G	F	E	E	E	F	P	G	F	G	E	F
Treflan	P	E	P	P	E	E	E	P	F	G	G	P	E	G	P	P	P	P	G
Treflan + Sencor or Lexone	P	E	F	F	E	E	E	G	G	E	E	E	E	G	G	F	G	E	F
Sugarbeets																			
Ro-Neet	P	E	G	P	E	E	E	P	P	G	E	F	E	G	P	P	P	P	G
Fieldbeans																			
Eptam	G	E	E	P	E	E	E	P	F	G	E	F	E	E	P	P	P	F	G
Eptam + Treflan	F	E	F	P	E	E	E	P	E	G	E	P	E	E	P	P	P	F	E

WEED RESPONSE TO POSTEMERGENCE HERBICIDES

Corn																			
AAtrex or Atrazine + crop oil	E	F	E	E	F	P	F	E	E	E	E	E	F	P	E	E	E	E	G
2,4-D	E	P	F	E	P	P	P	G	G	G	G	G	P	P	P	G	F	P	F
2,4-D + Banvel	E	P	P	E	P	P	P	F	G	G	G	G	P	P	E	G	G	E	G
Sorghum																			
AAtrex or Atrazine + Crop Oil	E	F	E	E	F	P	F	E	E	E	E	E	F	P	E	E	E	E	F
2,4-D	E	P	F	E	P	P	P	G	G	G	G	G	P	P	P	G	F	P	F

Response ratings:

E = Excellent

G = Good

F = Fair

P = Poor

Plant response may be altered by growing conditions, soil type, and rates of application. Ratings may vary from season to season and geographical areas within the state.

^a See Pages 8-10 for additional problem weeds and their control

^b Crop varieties vary in response to herbicides

FIELD CROPS POSTEMERGENCE

Excellent growing conditions make weeds more susceptible to postemergence herbicides. Likewise, crops may be more subject to herbicide damage when growing rapidly. *Adjust herbicide dosages downward* when excellent conditions for growth are present the week before application and *upward* when ideal growth is limited by one or more factors.

Crop	Herbicide	Lb active material needed/A	Apply this amount commercial product/A	Application time	Remarks
Barley and spring wheat	2,4-D amine	0.5 to 0.75	1 to 1.5 pt ³	} 5-leaf thru tillering	Do not treat winter barley in the fall. Spray broadleaf weeds as soon as good growing conditions occur in the spring. See page 10 for wild buckwheat control.
	2,4-D ester	0.25 to 0.5	0.5 to 1 pt ³		
Corn	atrazine	2	AAtrex or Atrazine 2.5 lb 80W or 2 qt AAtrex 4L	grass weeds 1" or less	Use with water-oil mixtures. Read product label. Lower rates control broadleaf weeds.
	2,4-D amine	0.5 to 1	1 to 2 pt ³	} Before corn is 8" high—over 8" use drop nozzles	Later applications may cause brittleness and stalk breakage. Use lower rate when good growing conditions exist to reduce corn injury. <i>Do not use Banvel near sugarbeets nor near field-beans and soybeans taller than 10". Use may be resumed after the bloom stage of beans.</i>
	2,4-D ester	0.25 to 0.5	0.5 to 1 pt ³		
	2,4-D amine + dicamba	0.25 + 2 oz	0.5 pt 2,4-D ³ + 4 oz Banvel		
Millet	2,4-D amine + dicamba	3/8 + 1/8	3/4 pt 2,4-D + 1/4 pt Banvel	2 to 5 leaf stage	See caution statement for corn. Prevent drift to desirable plants. Do not graze treated areas or harvest for dairy feed prior to crop maturity.
Oats	2,4-D amine	0.50	1 pt ³	} Tillering to joint stage	Some injury from 2,4-D may be expected at any stage. Refer to page 10 for wild buckwheat control.
	MCPA	1	1 qt ³		
Sorghum	atrazine	2	AAtrex or Atrazine 2.5 lb 80W or 2 qt AAtrex 4L	grass weeds 1" or less	Use with water-oil mixtures. Read product label. Lower rates effective on broadleaf weeds. Don't add oil if used on sand.
	2,4-D amine	0.5	1 pt ³	} During the period sorghum is 4" to 12" high. Over 12" use drop nozzles	Spraying before 4" stage may inhibit root development. Spraying without drop nozzles after 12" through early boot may inhibit head development.
	2,4-D ester	0.25	0.5 pt ³		
Sugarbeets	dalapon	2 to 4	2.7 to 5.4 lb Dowpon M	Grass weeds less than 2" tall	For annual grasses. Use higher rate (4 lb/A) on grass taller than 2". May cause crop injury if Ro-neet is used preemergence.
Winter wheat	2,4-D amine	0.5 to 0.75	1 to 1.5 pt ³	} Early spring before joint stage	Do not spray winter wheat in the fall. Spray broadleaf weeds as soon as good growing conditions occur in the spring. Refer to page 10 for wild buckwheat control.
	2,4-D ester	0.25 to 0.5	0.5 to 1 pt ³		

NON-CROP AREAS

Area or use	Herbicide	Apply this amount of commercial product	Application time	Remarks
Chemical mowing	cacodylic acid	1-2 gal Phytar 560/A	Postemergence	Apply on a warm sunny day.
	paraquat	2 qt Paraquat CL/A	Postemergence	Use enough water to insure good coverage. Add 1/2% X-77 wetting agent to spray solution.
Roadsides (Broadleaf weed control)	2,4-D	1 qt ³ 2,4-D/A	} Broadleaf weeds } 2 to 6 inches	Repeat treatments may be necessary. For woody species replace 1/2 lb 2,4-D with 1/2 lb 2,4,5-T. Do not use Banvel near susceptible plants.
	2,4-D + dicamba	1 qt ³ 2,4-D + 1 pt Banvel/A		
Irrigation ditchbanks	diuron or monuron	5-10 lb Karmex or Telvar/A	} Soon after ditches are open. Treat before weeds appear or soon thereafter	} Use enough water to insure good coverage. Use 50 mesh or coarser screens. May injure nearby trees and shrubs.
	atrazine or simazine	7.5 lb AAtrex 80W or Princep 80W/A or 1.5 gal AAtrex 4L/A		
Long term vegetation control	prometone	1 pt Pramitol 25E or 10-20 lb Pramitol 5PS/1000 sq ft	} Treat before weeds appear or soon thereafter	Some weeds will require higher rates. Consult label for specific instructions on problem weeds and conditions. Herbicides listed for irrigation ditchbanks can also be used for long term vegetation control. Consult label for rates.
	bromacil	0.5 lb Hyvar X or 1.5 pt Hyvar XL/1000 sq ft		
	bromacil + diuron	0.5 lb Krovar I/1000 sq ft		
	karbutilate	5 lb Tandex 4G or 0.25 lb Tandex 80W/1000 sq ft		
Perennial broadleaf weeds such as canada thistle, leafy spurge, field bindweed and bursage	2,4-D amine + picloram	1 qt 2,4-D Amine + 1 qt Tordon 22K/A or 2 qt Tordon 212/A	} Spring early bud stage or fall rosette	Do not use Tordon where water table is within 10 feet of soil surface. Do not use Tordon near streams or bodies of water. Do not use on cropland. Cropland includes fallow and grazing land.
	2,3,6 TBA	1 qt Benzac 1281 or Trysben 200 per 1000 sq ft		
Milkweed and perennial grasses such as brome grass and quackgrass	glyphosate	2 qt Roundup/A	Full foliage	Non-selective. Milkweed must be in bloom stage. Perennial grasses should have good top growth. Kills all annuals.

PASTURES, RANGES, AND FORAGE CROPS

Area or use	Herbicide	Lb ¹ active material needed/A	Apply this amount commercial product/A	Application time	Remarks
Alfalfa and birdsfoot trefoil seedlings	benefin	1.1 to 1.5	3 to 4 qt Balan	Preplant	Immediately incorporate by cross tandem disking or equivalent soil mixing. Early legume injury may occur.
	2,4-DB	1	2 qt 2 lb/gal amine Butyrac or Butoxone	When weeds are small	For broadleaf weeds. Do not use treated forage for 30 days. DO NOT CONFUSE WITH 2,4-D. Use when temperature is above 50°F.
	EPTC	3	2 qt Eptam	Preplant	Immediately incorporate by cross tandem disking or equivalent soil mixing. Early legume injury may occur.
Alfalfa (established 1 yr or more)	simazine	1 to 1.5	1.25 to 1.9 Princep 80W	Apply in late fall before soil freezes	Primarily for winter annual weeds. Injury may occur on soils with less than 1% organic matter.

PASTURES, RANGES, AND FORAGE CROPS—(Continued)

Area or use	Herbicide	Lb ¹ active material needed/A	Apply this amount commercial product/A	Application time	Remarks
Cool-season grass seedlings	2,4-D	0.50 to 0.75	1 to 1.50 pt ³	} 2- to 4-leaf stage of grass	For broadleaf weeds.
Warm-season grass seedlings	2,4-D	0.25 to 0.50	0.50 to 1 pt ³		
Warm-season grasses for seed	atrazine, diuron, or monuron	3	3 qt AAtrex 4L or 3.75 lb AAtrex, or Atrazine 80W, Karmex, or Telvar	Spring or fall before weed emergence	Do not use until second year after seeding. Less effective in heavy plant residues.
Annual or biennial broad-leaf weeds in pastures and ranges including snow-on-the-mountain	2,4-D	1	1 qt ³	} Rosette stage in fall or when weeds are small in spring	Withhold milk cows from grazing treated areas for 7 days after application. With dicamba mixture do not harvest hay for dairy animals within 37 days of application.
	2,4-D + dicamba	1 + 0.5	1 qt 2,4-D ³ + 1 pt Banvel		
Perennial broad-leaf weeds in pastures and ranges. Includes vervains, broom snake-weed, western ironwood and woolly loco	2,4-D	1 to 2	1 to 2 qt ³	} At bud stage of predominant weeds. ² April for dandelions	Annual treatment for 2 to 3 years may be necessary. Withhold milk cows from grazing treated areas for 7 days after application. With dicamba mixture do not harvest hay for dairy animals within 37 days of application.
	2,4-D amine + dicamba	1 + 0.5	1 qt 2,4-D ³ + 1 pt Banvel		

TROUBLESOME WEEDS AND WOODY PLANTS

Best control will be obtained if treatments are made when plants are actively growing. Plan to make more than one treatment. An application just before flowering and a second application on fall regrowth will give best results on most perennials.

Weed	Herbicide	Lb ¹ active material needed/A	Apply this amount commercial product/A	Application time	Remarks
Bursage, Skeletonleaf and woollyleaf	2,4-D	2	2 qt ³ emulsifiable formulations	} Early June or when growing actively ²	Same as for field bindweed except 2,4-D amine formulations less effective. If soil moisture conditions are poor, use oil-water emulsions as a carrier.
	2,4-D + dicamba	1 + 0.5	1 qt 2,4-D ³ + 1 pt Banvel		
Canada thistle	2,4-D	2	2 qt ³	} Fall (rosette) and spring early bud ²	Same as for field bindweed.
	2,4-D + dicamba	1 + 0.5	1 qt 2,4-D ³ + 1 pt Banvel		
Cattails	2,4-D ester	6	1.5 gal ³ + 5% diesel oil + 0.5% emulsifier	Boot to early flowering	} Use the equivalent of 150 gal of water per acre. Retreat regrowth as necessary.
	dalapon or dalapon + TCA		20 lb Dowpno M or 30 lb Dowpon C + 0.5% emulsifier	After flowering to fruiting	

¹ Refers to acid equivalent, phenol equivalent, or active ingredient as applicable, calculated on a broadcast or total coverage basis.

² Retreatment will be necessary.

³ Calculated on the basis of 4 lb/gal of acid equivalent (the chemicals in a product that are responsible for the herbicidal effects). For other formulations see conversion table on page 10.

TROUBLESOME WEEDS AND WOODY PLANTS--(Continued)

Weed	Herbicide	Lb ¹ active material needed/A	Apply this amount commercial product/A	Application time	Remarks
Cottonwood, willows, and Siberian elm	2,4-D ester	2 to 3	2 to 3 qt ³	Full foliage (early June) or basal treatment anytime	Aerial equipment: at least 5 gal carrier/A. Annual treatment for 2 to 3 years may be necessary. Basal treatment: 2 qt of herbicide/10 gal of diesel. Spray tree trunk to point of runoff.
Downy brome	atrazine	2	2.5 lb AAtrex or Atrazine 80W or 2 qt AAtrex 4L	Preemergence (fall or spring prior to April 1)	Use in waste areas such as fence rows and ditchbanks. Use sufficient water to insure good coverage.
	simazine	2	2.5 lb Princep 80W		
Field bindweed	2,4-D	1	1 qt ³	Vigorous fall growth or bud stage in spring ²	Avoid tillage 5 weeks before and 1 week after application. Plan to treat for several consecutive years.
	2,4-D + dicamba	1 + 0.5	1 qt 2,4-D ³ + 1 pt Banvel		
Hemp	2,4-D	0.5 to 1	1 pt to 1 qt	2 to 12 inches tall	At later growth stages use higher rate.
Hemp dogbane	2,4-D	1	1 qt ³	Spring bud stage ²	Use lower rates in crops.
	2,4-D	1 to 1.5	1 to 1.5 qt ³	Sept 1 to 30 ²	Surfactant may help. Can be used in standing corn and milo. Use the lower rate on milo.
	2,4-D + dicamba	1 + 0.25	1 qt 2,4-D ³ + 0.5 pt Banvel	After Sept. 10 until dogbane leaves turn yellow	Can be used in standing corn and milo. Do not apply within 30 days of harvest.
Hoary cress	2,4-D	2 to 4	0.5 to 1 gal ³ emulsifiable formulations	Rosette stage in the fall or early bud in spring ²	Same as for field bindweed except amine formulations less effective.
Johnsongrass (See shattercane for seedling control)	dalapon	5	6.7 lb Dowpon M	8 to 12" new growth or regrowth ²	Repeat treatment 3 times, 10 to 20 days apart. Treat when 70°F or above.
	TCA	80	100 lb Sodium TCA	Early spring ²	Use enough water to insure good coverage. Retreat escaped plants.
	MSMA	3	2 qt Ansar 529 H.C. or 3 qt Daconate	Boot stage	Treat when 70°F or above. Do not use on cropland or grassland.
Leafy spurge	2,4-D	2	2 qt ³ emulsifiable formulations	Early bud stage in spring or late fall ²	Same as for field bindweed except amine formulations less effective. Control seedlings.
	2,4-D + dicamba	1 + 0.5	1 qt 2,4-D ³ + 1 pt Banvel	Fall or spring ²	See remarks for field bindweed.
Milkweed, common	amitrole	4	4.4 lb Amino Triazole Weed-killer 90 or 2 gal Amitrol-T	Bud to bloom stage ²	Use enough water to insure good coverage. Do not use amitrole on cropland.
	2,4-D + dicamba	1 + 0.25	1 qt 2,4-D ³ + 0.5 pt Banvel		
Mullein common	2,4,5-T or silvex	1 to 1.5	1 to 1.5 qt 2,4,5-T or Silvex	Late fall treatment of rosettes or spring before flowering stalks lengthen	Essential to apply in rosette stage.

TROUBLESOME WEEDS AND WOODY PLANTS--(Continued)

Weed	Herbicide	Lb ¹ active material needed/A	Apply this amount commercial product/A	Application time	Remarks
Musk thistle	2,4-D	1.5 to 2	1.5 to 2 qt ³	Late fall treatment of rosettes or spring before flowering stalks lengthen	Chemicals other than 2,4-D not necessary for effective control. Annual treatments may be necessary for control of new seedlings.
Pricklypear	silvex	1 to 2	1 to 2 qt ³ Silvex	May 15 to June 15	Rotary hoe pads just prior to spraying. Add 1 gal/A diesel + 0.5% emulsifier in water carrier.
Poison ivy	amitrole	4	2 tbs Amino Triazole Weedkiller 90 90 or 1/2 cup Amitrol-T/ gal water	Full foliage (June) ²	Thoroughly wet all vegetation. Do not apply amitrole to cropland nor use 2,4,5-T in recreational areas.
	2,4,5-T	2	} 2 tbs ³ per gal of water		
	2,4-D+2,4,5-T	1 + 1			
Puncture vine	2,4-D ester	1	1 qt ³	Pre-bud stage most effective	Mature burs not affected by 2,4-D.
Ragweed, western (perennial)	2,4-D	1	1 qt ³	Early summer ²	Follow-up treatments may be necessary.
Russian knapweed	2,4-D	2	2 qt Emulsifiable formulations	} Early bud stage ²	Same as for field bindweed except amine formulations less effective.
	2,4-D + dicamba	1 + 0.5	1 qt 2,4-D ³ + 1 pt Banvel		
Russian olive	2,4-D+2,4,5-T	1 + 1	2 qt ³	Full foliage ² (early June)	See remarks for cottonwood.
Sagebrush (sand and fringed and green sagewort)	2,4-D ester	2	2 qt ³	4 to 8 inches new growth (June) ²	Use sufficient water to insure good coverage.
Shattercane (wild cane) and seedling Johnsongrass	butylate	4	4 3/4 pt Sutan+ 6.7E	Preplant to corn	} Incorporate immediately by cross tandem disking or equivalent soil mixing. Some crop injury may result from Treflan. Plant corn on the land the year following Princep treatment.
	EPTC plus safener	4	4 3/4 pt Eradicane or 4 1/2 pt Eptam + Protect seed treatment	Preplant to corn	
	simazine + EPTC	2 + 1.5	2.5 lb Princep 80W + 1 qt Eptam	Preplant to corn	
	trifluralin	1	1 qt Treflan	Preplant on soybeans	
Snowberry	2,4-D ester	1 to 2	1 to 2 qt ³	Full foliage ² (May 10 to 25)	Use sufficient water to insure good coverage.
Soapweed (Yucca)	silvex	2	2 qt ³	June ²	Use diesel as a carrier.
Swamp smartweed (tanweed)	2,4-D + dicamba	1 + 0.5	1 qt ³ 2,4-D ester + 1 pt Banvel	When growing vigorously ²	On crops use lower rates and amine formulations.
Wild buckwheat	bromoxynil + MCPA	0.25 + 0.50	1 pt Brominil or Bucril + 1 pt MCPA ³	After tillering	Do not use on oats. Thoroughly wet all vegetation.
	dicamba + 2,4-D amine	2 oz + 0.50 lb	4 oz Banvel + 1 pt 2,4-D ³	Early spring on winter wheat or oats	Banvel combinations will control knotweed. 2,4-D + Banvel can be used on millet in the 2 to 5 leaf stage.
	MCPA + dicamba	0.50 lb + 2 oz	1 pt MCP ³ + 4 oz Banvel		

DICTIONARY OF ADDITIONAL HERBICIDES

- Amilon**—A wettable powder combination of Amilon and Lorox for preemergence broadleaf and grass weed control in soybeans. Avoid use on sandy soils. Amchem.
- Alanap** (Naptalam)—A preemergence broadleaf and grass herbicide for soybeans and vine crops. Uniroyal Chemical.
- Alanap plus**—A combination of Alanap and Chloro-IPC for improved smartweed control. Uniroyal Chemical.
- Atrafine**—A trade name for atrazine. Farmland Industries.
- Basagran** (bentazon)—A new postemergence soybean herbicide for velvetleaf, cocklebur and other broadleaf weeds under 6-8". Available under EPA experimental permit label. BASF-Wyandotte.
- Betanal** (phenmedipham)—Postemergence broadleaf weed control in sugarbeets. **Bethanol 475** is similar in chemical structure and activity. Both products of Nor-Am.
- Bromex**—See Maloran. Nor-Am.
- Brominal** (bromoxynil)—A contact herbicide for selective control of broadleaf weeds in small grain. Amchem.
- Brominal plus**—A combination of bromoxynil and MCPA for use in small grain. Amchem.
- Bronate**—Similar to Brominal Plus. Rhodia-Chipman.
- Buctril** (bromoxynil)—Similar to Brominal. Rhodia-Chipman.
- Butoxone** (2,4-DB)—For selective control of cocklebur in soybeans and some small broadleaf weeds in seedling alfalfa. Rhodia-Chipman.
- Butyrac** (2,4-DB)—Similar to Butoxone. Amchem.
- Chem-Hoe** (propham)—Used pre- and postemergence for annual grass and smartweed control in alfalfa and soybeans. PPG Industries.
- Chloro IPC** (chlorpropham)—Similar to Chem-Hoc. PPG Industries.
- Cobex** (dinitramine)—A new preplant-incorporate soybean herbicide similar to Treflan for grass weed control. Slightly better control of some broadleaf weeds. Shorter soil life and narrower margin of crop safety. U. S. Borax.
- Dinitro Weed Killer** (dinoseb)—A contact weed killer for use in alfalfa, corn, and soybeans. Can be used preemergence or early post when soybeans are in the cotyledon stage. Highly toxic to warm blooded animals. Also sold as Dow Selective Weed Killer and Preemerge.
- Dyanap**—A combination of Alanap and dinitro. Use preemergence or at "cracking stage" of soybeans. Controls most annual weeds. Highly toxic. Uniroyal.
- Evik** (ametryn)—Used as a directed postemergence contact spray for weed control in corn. Ciba-Geigy.
- Furloe** (propham)—Similar to Chem-Hoc. PPG Industries.
- Igran** (terbutryn)—A short residual s-triazine used principally for preemergence weed control in sorghum. Generally combined with AAtrex or Milogard for broader spectrum weed control and reduced soil residues. Low soil temperature and "herbicide splash" onto emerged plants may cause sorghum injury. Ciba-Geigy.
- Kerb** (pronamide)—A new herbicide suggested for preemergence weed control in established alfalfa. Rohm and Haas Co.
- Knoxweed**—A combination of Eptam and 2,4-D for preemergence annual weed control in corn. Do not use on sandy soils. Stauffer.
- Maloran** (chlorbromuron)—A substituted urea used preemergence for broadleaf weed control in soybeans and corn. Frequently used in combination with a grass herbicide. Similar to Lorox. Supply uncertain. Ciba-Geigy.
- Modown** (bifenox)—A new herbicide being developed for preemergence control of broadleaf and certain grass weeds in soybeans, sorghum and corn. EPA experimental permit label expected in 1975. Mobil Chemical Company.
- Milogard** (propazine)—Used for preemergence weed control in sorghum. Performs best on soils low in organic matter. Often combined with AAtrex and Igran for improved annual grass control. Ciba-Geigy.
- Mondak**—A combination of Banvel and MCPA for broadleaf weed control in small grain. Velsicol.
- Norex** (chloroxuron)—For early postemergence use in soybeans. Weeds must be less than 1½" tall. Nor-Am.
- Outfox** (cyprazine)—Used postemergence for selective weed control in corn. Weeds should be less than 2 inches and corn under 10 inches. Gulf Oil Chemical Co.
- Prefox**—A combination of Outfox and ethiolate for preplant-incorporated weed control in corn. Short soil life. EPA experimental permit label. Gulf Oil Chemical Co.
- Preforan** (fluorodifen)—No production for 1975. Used preemergence in soybeans. Ciba-Geigy.
- Preemerge**—see Dinitro Weed Killer. Dow.
- Princep** (simazine)—A long lasting preemergence or preplant incorporated s-triazine herbicide for corn. Commonly mixed with AAtrex and Eptam for broader spectrum weed control. Also registered for dormant season weed control in established alfalfa. Ciba-Geigy.
- Probe** (methazole)—A new broad spectrum herbicide suggested for sorghum and soybeans. Methods of application include preplant, preemergence and postemergence. EPA experimental permit label. Velsicol.
- Prowl**—An experimental preemergence herbicide for corn grown on soils with more than 2% organic matter. EPA experimental permit label. American Cyanamid.
- Pyramin** (pyrazon)—Used for preemergence control of broadleaf weeds in sugarbeets. Often combined with other herbicides. BASF.
- Randex** (CDAA)—A preemergence grass herbicide for corn, sorghum and soybeans. **Randex T**, for use on corn only, combines Randex with TCBC for improved broadleaf weed control. Monsanto.
- Salvo**—A low volatile ester formulation of 2,4-D. Olin.
- Solo**—Alanap plus Chloro-IPC for grass and broadleaf weed control in soybeans. Uniroyal.
- Soyex**—Same as Preforan. Nor-Am.
- Surflan** (oryzalin)—A new product for preemergence weed control in soybeans. Most effective against grasses. Limited supplies. Elanco.
- Tenorán**—Same as Norex. Ciba-Geigy.
- Tolban** (profluralin)—A new preplant soil incorporated soybean herbicide similar to Treflan in performance. Limited supplies in 1975. Ciba-Geigy.
- Vernam** (vernolate)—A preplant soil incorporated herbicide for use on soybeans. Early injury symptoms not usually reflected in harvested yields. Stauffer.

CLEANING THE SPRAYER

First rinse the sprayer with a material which acts as a solvent for the herbicide. Kerosene and fuel oils carry away oil-soluble herbicides such as 2,4-D ester. Chemicals which form emulsions when mixed with water are oil-soluble. After the oil rinse, a rinse with water containing detergent will help remove the oil. Oil-soluble herbicides are the most difficult to remove. 2,4-D amine salts are water-soluble.

For most water-soluble herbicides repeated rinsing with water is usually enough. Hormone type require extra precautions. If 2,4,5-T, silvex, Banvel, or 2,4-D were used, fill the tank with water and ammonia. Add household ammonia at the rate of 1 quart of household ammonia to 25 gallons of water. Pump enough solution through the hose and nozzles to fill these parts completely. Then fill the tank, close, and leave for 24 hours before rinsing thoroughly with water.

Activated charcoal can be used after the preliminary rinsing to decontaminate the sprayer. A 3% suspension absorbs the 2,4-D. Agitate the suspension for 2 to 3 minutes and drain, then rinse thoroughly with clear water.

For wettable powder herbicides, see that none of the powder remains in the tank. A thorough rinsing with water is usually sufficient. Thoroughly clean all equipment immediately after use.

Conversion Table

Pounds of active material per gal of commercial product	Pints of commercial product needed per acre to give the following pounds of herbicide per acre		
	¼ lb	½ lb	1 lb
2.00	1	2	4
2.64	¾	1½	3
3.00	⅔	1⅓	2⅔
3.34	⅖	1⅓	2⅔
4.00	½	1	2
6.00	⅓	⅔	1⅓

¹ Refers to acid equivalent, phenol equivalent, or active ingredient as applicable, calculated on a broadcast or total coverage basis.
² Retreatment will be necessary.

³ Calculated on the basis of 4 lb/gal of acid equivalent (the chemicals in a product that are responsible for the herbicidal effects). For other formulations see conversion table above.

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