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EC61-130 Chemicals that Control Weeds

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EC 61-130

Chemicals that Control Weeds

— a guide for 1961

by

O. C. Burnside, J. D. Furrer, M. K. McCarty,
R. W. Bovey, and G. A. Wicks

This leaflet gives suggestions for weed control based on research results at the Nebraska Agricultural Experiment Station and elsewhere. We have listed what we believe to be the most effective weed killers, and their recommended rates and times of application.

Also included is a section on desiccants, or chemicals used to dry crops and weeds in the field. Their use permits earlier harvest.

It is hazardous to use agricultural chemicals for purposes other than those specified by the approved label on the container. The Federal Food, Drug and Cosmetic Act, as amended, authorizes the seizure of any raw agricultural commodity moving in interstate commerce which carries a pesticide residue in excess of the established tolerance. Read the label carefully. Observe the precautions shown on the label when handling any chemical.

Because of the danger of drift, any user of an agricultural chemical must exercise judgment when spraying. Do not spray on a windy day. Wind may cause poor coverage and excessive drift.

Extension Service
University of Nebraska College of Agriculture
and U. S. Department of Agriculture
Cooperating
E. F. Frolik, Dean; E. W. Janike, Director

Calibrate your equipment before applying chemicals!

FIELD CROPS

Crop	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Corn	atrazine	2 to 3	2.5 to 3.75 lb Atrazine 80W[4]	Pre-emergence[2] or before weeds are 1½″ tall	A 13″ band application will reduce the total herbicide used by two-thirds. Atrazine may carry over in the soil and injure following crops. On sandy soil use only Atrazine and at the 2 lb rate. 2,4-D may cause injury.
	2,4-D ester	1 to 2	1 to 2 qt[3,4]	Pre-emergence[2]	
	CDAA	5 to 6	5 to 6 qt Randox[4]		
	CDAA and TCBC	3½ + 7	5 qt Randox T[4]		
	2,4-D amine 2,4-D ester	½ to 1 ¼ to ½	1 to 2 pt[3] ½ to 1 pt[3]	Before corn is 18″ high—over 18″ use drop nozzles	Later applications may cause brittleness and stalk breakage. Use lower rate when good growing conditions exist.
Sorghum	CDAA	5 to 6	5 to 6 qt Randox[4]	Pre-emergence[2]	Band applications reduce herbicide cost. Most effective on annual grasses.
	2,4-D amine 2,4-D ester	½ ¼	1 pt[3] ½ pt[3]	During the period sorghum is 4 to 12 inches high	Spraying before 4″ stage may inhibit root development, and spraying during 13″ stage through early boot stage may inhibit head development.
Soybeans	CDAA NPA	5 to 6 4	5 to 6 qt Randox[4] 2 gal Alanap-3[4]	Pre-emergence[2]	Band applications reduce herbicide cost. Randox most effective on annual grassy weeds. Alanap most effective on annual broadleaf weeds.
Wheat	2,4-D amine 2,4-D ester	½ to ¾ ¼ to ½	1 to 1½ pt[3] ½ to 1 pt[3]	5-leaf to early boot	Do not treat winter wheat in the fall.
Oats	2,4-D amine MCP	½ 1	1 pt[3] 1 qt[3]	6-leaf to flag leaf	Some injury may be expected at any stage with 2,4-D.
Barley	2,4-D amine 2,4-D ester	½ to ¾ ¼ to ½	1 to 1½ pt[3] ½ to 1 pt[3]	5-leaf to early boot	Do not treat winter barley in the fall.
Alfalfa, and birdsfoot trefoil seedlings	EPTC	3	2 qt Eptam[4]	Pre-plant	Incorporate into the soil. Do not graze forage within 60 days of treatment. Early injury may occur.
	dalapon	2 to 3	2½ to 3¾ lb Dowpon	2 to 3 weeks after alfalfa emerges	For annual grasses. Do not use treated forage for feed.
	4-(2,4-DB)	1	2 qt 2 lb/gal Butoxone or Butyrac	When weeds are small	For broadleaf weeds. May be mixed with dalapon. Do not use treated forage for feed.
Alfalfa, established	4-(2,4-DB)	1	2 qt 2 lb/gal Butoxone or Butyrac	When weeds are small	For broadleaf weeds in seed fields.
	dalapon	3	3¾ lb Dowpon	When grasses are small or following first cutting	For annual grass control in seed fields only.
Cool-season grass seedlings	2,4-D	½ to ¾	1 to 1½ pt[3]	2- to 4-leaf stage	For broadleaf weeds.
Warm-season grass seedlings	2,4-D	¼ to ½	½ to 1 pt[3]		
Established, warm-season native grasses	~~monuron or~~ diuron	~~2 to 3~~	~~2.5 to 3.75 lbs~~ Karmex or Telvar	~~Spring or fall~~ before weed emergence	~~For seed fields only.~~

native grasses | emergence

PASTURES, RANGES, WOODY PLANTS, AND NON-CROP AREAS

Area or use	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Annual broadleaf weeds in pastures and ranges	2,4-D	1	1 qt[3]	When weeds are small	Apply in April for pennycress and other mustards.
Perennial broadleaf weeds in pastures and ranges	2,4-D	1 to 1½	1 to 1½ qt[3]	At bud stage of predominant weeds	Annual treatment for 2 to 3 years may be necessary.
Fence rows and roadsides (broadleaf weeds)	2,4-D	1	1 qt[3]	Weed height 2 to 4 inches	Repeat treatments may be necessary. Add 1 lb/acre of 2,4,5-T for wild rose and horse nettle.
Buckbrush	2,4-D ester	1 to 2	1 to 2 qt[3]	Full foliage (May 10 to 25)	Aerial equipment: apply chemical in 2 to 5 gal diesel/A. Ground equipment: use sufficient water to insure good coverage.
Cottonwood and willows	2,4-D ester	2 to 4	2 to 4 qt[3]	Full foliage (early June)	Aerial equipment: at least 5 gal diesel/A. Basal treatment: 2 qt of 2,4,-D ester/10 gal of diesel. Spray tree trunk to point of run-off.
Poison ivy	amitrol		2 tbs Amino Triazole or Weedazol/gal water	Full foliage (June)	Thoroughly wet all vegetation.
	2,4,5-T or 2,4-D + 2,4,5-T		2 tbs[3] per gallon water		
	AMS		¾ lb Ammate X/gal water		
Sagebrush (sand or green)	2,4-D ester	1	1 qt[3]	4 to 8 inches new growth (June)	Same as for buckbrush.
Irrigation ditchbanks	monuron or diuron	8	10 lb Karmex or Telvar	Soon after ditches are open	Use enough water to insure good coverage. Use screens of 50 mesh or larger. Agitation required.
	2,4-D ester and dalapon	1 and 10	1 qt 2,4-D[3] and 14 lb Dowpon	Weed height 2 to 4 inches	Repeat applications may be necessary.
	simazine or atrazine	6	7½ lb Simazine 80W or Atrazine 80W	Before weeds appear or soon thereafter	Use enough water to insure good coverage. Agitation required.
Soil sterilant for drives, storage areas, industrial sites, parking lots, fence lines, etc.	diuron or monuron	20 to 40	25 to 50 lb Telvar or Karmex	Follow manufacturer's recommendations	Complete control of annuals, biennials, and most perennials. Consider possible damage to nearby trees and shrubs and possible movement of sterilant with runoff water.
	simazine or atrazine	20	25 lb Simazine 80W or Atrazine 80W		
	sodium chlorate	4 to 6 lb/sq rd	4 to 6 lb		
	erbon	40 to 80	10 to 20 gal Novon Concentrate or Baron		
	monuron-TCA		1 lb Urox per sq rd		
Mixtures	borate-monuron	Follow manufacturer's recommendations.	Ureabor		
	chlorate-borate		Polybor-chlorate, Chlorax, and Atlacide		
	chlorate-borate-monuron		Chlorea		
	simazine-amitrol		Amizine		
	silvex-dalapon		Garlon	Early weed growth	

[1] Refers to acid equivalent, phenol equivalent, or active ingredient as applicable.
[2] Refers to a herbicide treatment made from planting time to crop emergence.
[3] Calculated on the basis of 4 lb/gal material. For other formulations see conversion table at right.
[4] Granular material also available.

CONVERSION TABLE

Lb. of Active Ingredient Per Gal. of Commercial Product	Pts. of Commercial Product Needed Per Acre to Give the Following Lbs. of Chemical 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	⅗	1⅕	2⅖
4.00	½	1	1½
6.00	⅓	⅔	1⅓

TROUBLESOME WEEDS

Weed	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Field bindweed	2,4-D	1	1 qt[3]	Bud stage in spring and on vigorous fall growth	Avoid tillage 10 to 12 weeks before and 1 to 2 weeks after application. Plan to treat for several consecutive years.
	sodium chlorate	6 lb/sq rd	6 lb	Fall or spring	Good soil moisture necessary. Observe safety precautions.
	borate-chlorate mixtures	7½ lb/sq rd	10 lb	Fall or spring	Good soil moisture necessary.
	2,3,6-TBA (Benzoic acid)	20	1½ lb/sq rd Benzabor or ½ pt/sq rd Benzac 1281 or Trysben 200	Fall or spring	Do not disturb areas during year of application. Fall application more effective.
	PBA (Benzoic acid)	40	10 gal/A or ½ pt/sq rd of 4 lb/gal polychlorobenzoic acid	Fall or spring	Same as for 2,3,6-TBA.
Canada thistle	Sodium chlorate, borate-chlorate mixtures, 2,3,6-TBA, and PBA as listed for field bindweed control.				
	2,4-D	2	2 qt[3]	Spring (early bud) and fall (rosette)	Same as for field bindweed.
	amitrol	4 to 6	8 to 12 lb Amino Triazole or Weedazol	Before bloom or on regrowth following mowing	Use enough water to insure good coverage.
Leafy spurge	Sodium chlorate, borate-chlorate mixtures, 2,3,6-TBA, and PBA as listed for field bindweed control.				
	2,4-D	2	2 qt[3]	Early bud stage	Same as for field bindweed except amine formulations less effective.
	AMS	4 lb/sq rd	4 lb "Ammate" X	Spring	Use enough water to insure good coverage. A sticker-spreader increases effectiveness.
	erbon	1 lb/sq rd	1 qt Novon Concentrate	Fall or spring	Use enough water to insure good coverage.
Hoarycress (perennial peppergrass)	Sodium chlorate, borate-chlorate mixtures, 2,3,6-TBA, and PBA as listed for field bindweed control.				
	2,4-D	2 to 4	½ to 1 gal[3]	Early bud in spring or rosette stage in the fall	Same as for field bindweed except amine formulations less effective.
Russian knapweed	Sodium chlorate, borate-chlorate mixtures, 2,3,6-TBA, and PBA as suggested for field bindweed; erbon as listed for leafy spurge control.				
	2,4-D	2	2 qt[3]	Early bud stage	Same as for field bindweed except amine formulations less effective.
Bur ragweed	Sodium chlorate, borate-chlorate mixtures, 2,3,6,-TBA, and PBA as listed for field bindweed; erbon as listed for leafy spurge control.				
	2,4-D	2	2 qt[3]	During June	Same as for field bindweed except amine formulations less effective. If soil moisture conditions are poor, use oil-water emulsions as a carrier.
Nodding or musk thistle	2,4-D	1	1 qt[3]	Spring before flowering stalks lengthen and late fall treatment of rosettes	A biennial. Chemicals other than 2,4-D not necessary for effective control.
Puncture vine	2,4-D ester	1	1 qt[3]	Pre-bud stage most effective	Mature burs not affected by 2,4-D.
Johnsongrass	Sodium chlorate and borate-chlorate mixtures as recommended for field bindweed control.				
	TCA	80	100 lb 90% Sodium TCA	Early spring	Use enough water to insure good coverage. Retreat escaped plants.
	dalapon	5	7 lb Dowpon	8 to 12 inches high	Repeat treatment 3 times, 10 to 20 days apart.
	erbon	½ lb/sq rd	1 pt Novon Concentrate	Early spring	Use enough water to insure good coverage. Retreat escaped plants.
Tanweed	Sodium chlorate and borate-chlorate mixtures as recommended for field bindweed control.				
	2,4-D ester	1	1 qt[3]	When growing vigorously	Controls top growth principally. Repeat treatment necessary.
Milkweed	amitrol	4	8 lb Amino Triazole or Weedazol	Bud to bloom stage	Use enough water to insure good coverage.

LAWN AND TURF WEEDS

Weed	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Broadleaf weeds such as dandelion, ragweed, field bindweed, and plantain	2,4-D amine	1	2 tbs[3] per gallon of water per 1000 sq ft	Spring, summer, or fall	Avoid drift on desirable broadleafs.
Chickweed, henbit violets, and knotweed	silvex	Follow container recommendations		Spring or fall	Use enough water to insure good coverage.
White clover	2,4,5-T or silvex	Follow container recommendations		Spring or fall	Repeat treatments may be necessary.
Crabgrass	AMA or DMA (organic arsenics)	Follow container recommendations		After emergence	Repeat treatment every 7 days for 2 to 3 applications. Also appears to be effective on foxtail. Poisonous.
	PMA		3 oz of 10% material/1000 sq ft	2 to 4 leaves on crabgrass	Repeat treatment every 7 days for 3 applications. Also controls certain diseases. Poisonous.
	kerosene		1 qt/100 sq ft	2 to 4 leaves on crabgrass	Use water-white kerosene. Do not dilute. Apply when temperature is below 90° F.
Crabgrass, foxtail, and other annual grasses	arsenicals	3 to 5 lb metalic arsenic/1000 sq ft	12 lb calcium arsenate, 24 lb lead arsenate	Pre-emergence (early spring before weeds germinate or late fall)	Also controls certain insects. Use only on established grass. Poisonous.
Nimblewill	dalapon	¼ lb/gal water	⅓ lb Dowpon	When growing vigorously	Thoroughly wet all plants. Kills all grass. Reseed or resod in 4 to 6 weeks.

PRE-HARVEST DESICCANTS FOR SEED CROPS

Seed crop	Chemical	Lbs. active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Legumes for seed: alfalfa, red clover, and sweetclover	DNBP or DNAP	1¼ to 2	3 to 5 pt of 3 lb/gal dinitro	After most of the seed pods have turned brown	Aerial equipment: apply chemical in 5 to 10 gal diesel/A. Dinitro compounds are poisonous, so treated foliage or seed must not be fed.
	PCP (Penta)	4 to 6	4 to 6 qt 40% pentachlorophenol	After most of the seed pods have turned brown	Same as above.
	endothal	4 to 6	4 to 6 qt of 4 lb/gal material	After most of the seed pods have turned brown	Less effective than DNBP, DNAP, or PCP except at temperatures below 60° F.
Grain sorghum for seed	DNBP or DNAP	1¼ to 2	3 to 5 pt 3 lb/gal dinitro	Grain should be fully colored and moisture down to 35% to 40%	Aerial equipment: apply chemical in 5 to 10 gal diesel/A. Dinitro compounds are poisonous, so treated foliage or seed must not be fed.
	PCP (Penta)	4 to 6	4 to 6 qt 40% pentachlorophenol	Same as above	Same as above.
	magnesium chlorate		2 gal Milo-Mag or 3½ gal De-Fol-Ate	Same as above	Aerial equipment: apply chemical in 5 to 10 gal water. Generally less effective than DNBP, DNAP, or PCP.
	nitrogen solutions	Apply at a rate to give at least 16 lb total nitrogen per acre		Same as above	Trial basis only.

[1] Refers to acid equivalent, phenol equivalent, or active ingredient as applicable.
[2] Refers to a herbicide treatment made from planting time to crop emergence.
[3] Calculated on the basis of 4 lb/gal material.

LAWN AND TURF WEEDS

Weed	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Broadleaf weeds such as dandelion, ragweed, field bindweed, and plantain	2,4-D amine	1	2 tbs[3] per gallon of water per 1000 sq ft	Spring, summer, or fall	Avoid drift on desirable broadleafs.
Chickweed, henbit violets, and knotweed	silvex	Follow container recommendations		Spring or fall	Use enough water to insure good coverage.
White clover	2,4,5-T or silvex	Follow container recommendations		Spring or fall	Repeat treatments may be necessary.
Crabgrass	AMA or DMA (organic arsenics)	Follow container recommendations		After emergence	Repeat treatment every 7 days for 2 to 3 applications. Also appears to be effective on foxtail. Poisonous.
	PMA		3 oz of 10% material/1000 sq ft	2 to 4 leaves on crabgrass	Repeat treatment every 7 days for 3 applications. Also controls certain diseases. Poisonous.
	kerosene		1 qt/100 sq ft	2 to 4 leaves on crabgrass	Use water-white kerosene. Do not dilute. Apply when temperature is below 90° F.
Crabgrass, foxtail, and other annual grasses	arsenicals	3 to 5 lb metalic arsenic/1000 sq ft	12 lb calcium arsenate, 24 lb lead arsenate	Pre-emergence (early spring before weeds germinate or late fall)	Also controls certain insects. Use only on established grass. Poisonous.
Nimblewill	dalapon	¼ lb/gal water	⅓ lb Dowpon	When growing vigorously	Thoroughly wet all plants. Kills all grass. Reseed or resod in 4 to 6 weeks.

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Seed crop	Chemical	Lbs. active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Legumes for seed: alfalfa, red clover, and sweetclover	DNBP or DNAP	1¼ to 2	3 to 5 pt of 3 lb/gal dinitro	After most of the seed pods have turned brown	Aerial equipment: apply chemical in 5 to 10 gal diesel/A. Dinitro compounds are poisonous, so treated foliage or seed must not be fed.
	PCP (Penta)	4 to 6	4 to 6 qt 40% pentachlorophenol	After most of the seed pods have turned brown	Same as above.
	endothal	4 to 6	4 to 6 qt of 4 lb/gal material	After most of the seed pods have turned brown	Less effective than DNBP, DNAP, or PCP except at temperatures below 60° F.
Grain sorghum for seed	DNBP or DNAP	1¼ to 2	3 to 5 pt 3 lb/gal dinitro	Grain should be fully colored and moisture down to 35% to 40%	Aerial equipment: apply chemical in 5 to 10 gal diesel/A. Dinitro compounds are poisonous, so treated foliage or seed must not be fed.
	PCP (Penta)	4 to 6	4 to 6 qt 40% pentachlorophenol	Same as above	Same as above.
	magnesium chlorate		2 gal Milo-Mag or 3½ gal De-Fol-Ate	Same as above	Aerial equipment: apply chemical in 5 to 10 gal water. Generally less effective than DNBP, DNAP, or PCP.
	nitrogen solutions	Apply at a rate to give at least 16 lb total nitrogen per acre		Same as above	Trial basis only.

[1] Refers to acid equivalent, phenol equivalent, or active ingredient as applicable.
[2] Refers to a herbicide treatment made from planting time to crop emergence.
[3] Calculated on the basis of 4 lb/gal material.