



Larry W. Mitich
Assistant Agronomist



John D. Nalewaja
Assistant Agronomist
Agricultural Experiment Station

L. A. Jensen
Agronomist

CHEMICAL WEED CONTROL

in Field Crops and for Perennial Weeds

CIRCULAR A-253

JANUARY 1964

Chemical weed control recommendations in this circular are based on information available from the North Dakota Agricultural Experiment Station and the Research Committee of the North Central Weed Control Conference.

It is essential that food and feed products contain no herbicide residues. Use only chemicals registered by the Federal Food and Drug Administration. Detailed research has been conducted on all registered herbicides. This insures that when registered chemicals are applied as directed, residues on crops will be within the established tolerance. Use each chemical only as recommended on the label of the container.

Recommended rates are based on active ingredient or acid equivalent unless otherwise indicated. For example, 1 pint of 2,4-D (4 pounds 2,4-D acid per gallon) equals 1/2 pound of 2,4-D acid equivalent and 1 pound of dalapon powder equals 3/4 pound acid equivalent.

SELECTIVE HERBICIDES can be an effective supplement to good cultural practices in controlling weeds in field crop production. Timely applications of selective chemicals at the recommended rates will control many annual weeds satisfactorily without damaging the crop in which the weeds are growing. Perennial weeds such as field bindweed, leafy spurge, Canada thistle and perennial sow thistle in crops can also be controlled with chemicals.

To avoid crop injury and achieve good weed control, follow closely the instructions on the container. Consider both the crop tolerance and kind of weeds present in determining the rate to use.

Timely application of weed control chemicals in growing crops is important. Weed competition will

reduce crop yields severely, unless weeds are removed early.

Do not spray when there is danger of drift, or when winds are blowing toward a neighboring crop or planting more susceptible than the crop being sprayed. Ideal temperatures for spraying are 65 to 85 degrees. Below 60 degrees, weeds are killed very slowly; above 90 degrees there is danger of crop injury.

Weeds more susceptible to 2,4-D than MCPA include Russian thistle, false flax, wild buckwheat, smartweed, redroot pigweed, ball mustard, flixweed and sowthistle.

Use the higher suggested rate of chemical when spraying for several kinds of weeds in one crop. For hard-to-kill weeds, rates higher than suggested may be required even though some spray injury to the crop may result. The lower rates of chemical are suggested only when growth is rapid or when very susceptible weeds are being sprayed.

PREEMERGENCE HERBICIDES in North Dakota and other Great Plains states have given erratic and undependable results in selective weed control. Performance seems to vary from year to year and field to field, and depends on many factors including soil moisture, soil temperature, rainfall after application and soil type. For these reasons, preemergence chemicals applied on the soil surface are not recommended. Those that can be mixed into the surface soil have a better chance for success.

PERENNIAL WEEDS are long lived and persistent. Choice of chemical depends on the size of area to be treated and on whether it is to be cropped. Successful control requires thorough followup. Noxious weeds may re-establish quickly if some plants escape being sprayed or if the area contains numerous seeds.

Case
S
544.3
N9
A8
no. 253

CHEMICAL WEED CONTROL
For Field Crops

CROP	Herbicide	Act. Ingrid. lb/A	Weeds	When to apply	Remarks	
WHEAT, DURUM or BARLEY ^{1/}	2,4-D amine 2,4-D ester	1/4 to 1/2 1/4 to 1/3	broadleaf	Crops--5th leaf to early boot	Apply not later than boot stage. Barley more sensitive than wheats.	
	MCPA	1/4 to 1/2	broadleaf	Crops--emergence to early boot	Can be applied much earlier than 2,4-D.	
WINTER WHEAT	2,4-D amine	1/4 to 1/2	broadleaf	Crops--fully tillered to early boot	Fall application not recommended.	
RYE	2,4-D ester	1/4 to 1/3				
OATS ^{1/ 2/}	MCPA	1/4 to 1/2	broadleaf	Oats--emergence to early boot	Early jointing stage most sensitive. Do not spray oats unless necessary.	
FLAX ^{1/ 2/}	MCPA	1/4 or less	broadleaf	Flax 2 to 6 in. tall	Use higher rates or esters only for hard-to-kill weeds.	
	Dalapon (Dowpon)	3/4	annual grass not w. oats	Best results when flax is over 2 in. and weeds are under 2 in. tall	Mix MCPA or 2,4-D ^{2/} with Dalapon or TCA and apply at about 4/5 normal rate per acre to control both broadleaf and annual grassy weeds. Legumes not injured by Dalapon or TCA.	
	TCA	5				
SMALL GRAIN PRE-HARVEST	2,4-D ester	1	broadleaf	Crop--early dough stage		Use only when weeds threaten to interfere with harvest operations.
CORN OR SORGHUM	2,4-D amine	1/4 to 1/2	broadleaf	Corn--3 in. to tassel Sorghum--4 to 12 in. tall	Use drop nozzle when corn is over 8 in. tall.	
CORN ^{3/} (For trial use only)	CDAAs (Radox)	4	annual grass not w. oats	Preemergence	Erratic results, depends on rainfall. Band application reduces cost.	
	CDAAs-T (Radox T)	4½ (quarts)	annual grass & broadleaf			
	2,4-D	1 to 1½	broadleaf and grass --not w. oats			
CORN	2,4-D plus Dalapon	1/2 1½	broadleaf and grass	Postemergence--corn 8-20 in. tall	Use directed spray equipment with leaf lifters. Apply on a 14-inch band over the row. Spray no higher than the lower half of stalk (ground to whorl) or no higher than bottom 7 in. of stalk.	
SOYBEANS (For trial use only)	CDAAs (Radox)	4 to 5	annual grass not w. oats	Preemergence	Band application reduces cost. Results have been erratic.	
	Amiben	2 to 4	annual grass & broadleaf			
SUGARBEETS (See section below for wild oats control)	Dalapon	3	annual grass not w. oats	After weeds are up	Apply while beets are small.	
	TCA	5 to 7	annual grass not w. oats	Preemergence	Do not use tops for livestock feed.	
	Endothal	1 to 2	wild buckwheat	Beets--3-6 leaf and weeds emerged	Do not apply more than 40 days after beet emergence.	
GRASS Seedling	2,4-D	1/2 to 3/4	broadleaf	After 3-leaf stage	Heavier rates may be used after grass is well tillered.	
Established	2,4-D	3/4 and up	broadleaf	Weeds--emergence to bud stage	Apply when weeds are susceptible.	
LEGUMES Alfalfa & clover with nurse crop	4-(2,4DB)	1/2 to 1	broadleaf	Not before legumes are 2 in. tall	Sweetclover injured.	
	MCPA or 2,4-D amine	1/8 to 1/4			Delay to get weed and crop canopy. Possible injury to sw. clover and alfalfa.	
	Alfalfa, trefoil or sw. clover alone. Established or seedling stage.	Dalapon	3/4 to 1	annual grass not w. oats	Weeds 1 to 2 in. tall	Seedling or old stands not for hay or pasture. Do not use with small grain nurse crop. Second year sw. clover may be injured.
		TCA	5	annual grass not w. oats		
	4-(2,4DB)	1/2 to 1	broadleaf	When weeds are small	4-(2,4DB) and dalapon can be mixed but no dalapon label clearance for hay or pasture. 4-(2,4DB) must be applied 30 days before hay harvest or grazing.	

^{1/} When used as a nurse crop for legumes or grasses, see later sections.

^{2/} 2,4-D is not recommended unless such hard-to-kill weeds as Russian thistle, wild buckwheat, smartweed, pigweed or sow thistle are present.

^{3/} Atrazine residues are likely to remain in soil for more than one year and may damage following crops other than corn.

CROP	Herbicide	Rate/A	Crop	When to apply	Remarks
WILD OATS Selective control in crops	DATC-BW (Far-go)	1 1/4 lb	Barley	Immediately after planting	Apply on smooth soil surface and incorporate in top 2 inches by cultivation. Kills wild oats in soil for about 6 weeks
		1 lb	Wheat & durum		
	DATC (Avadex)	1 1/2 lb	Flax, sugar-beets, potatoes & safflower	Preplanting	
			Corn & peas	Preplanting or preemergence	
	Barban (Carbyne)	4 to 6 oz	Wheat, durum, barley, flax, peas & safflower	Wild oats--1 1/2 leaf stage Crops: sm. gr. before 4th leaf stage flax before 12th leaf stage peas before 6th leaf stage safflower before 8th leaf stage	
12 to 16 oz			Sugarbeets		

CHEMICAL WEED CONTROL
For Perennial Weeds

WEED	Herbicide ^{1/}	Act. Incred. lb/A or sq rd	When to apply	Remarks
FIELD BINDWEED (Creeping Jenny) On fallow	2,4-D for large areas	3/4 lb/A	Bud to bloom or fall	Cultivate fallow until mid-July, then spray. Respray in following year's crop.
Patches or ind. plants	Benzabor	1 to 1 1/2 lb/sq rd	Late fall or early spring	Apply dry--long soil sterility.
	TBA (Benzoic)	10-20 lb/A	Bud stage	Residual effect 1 year or more.
LEAFY SPURGE Fallow year	2,4-D ester for large areas	1 lb/A	Early bud stage and fall	No cultivation before spraying. Apply both spring and fall. Respray in following year's crop.
Patches or ind. plants	AMS (Am-mate X) ^{2/}	1 lb/sq rd	Summer	Use 2,4-D when seedlings appear.
	2,4-D	40 lb/A	After Sept. 20	No permanent injury to perennial grasses.
	TBA (Benzoic)	20 lb/A	Bud stage	Residual 2 years or more.
	Benzabor	1 to 1 1/2 lb/sq rd	Late fall or early spring	Apply dry--long soil sterility.
	Erbon (Baron)	3/4 lb/sq rd	Bud stage--spring or fall	Slow acting especially under dry conditions.
CANADA THISTLE	Amitrole Amitrole-T	4 lb/A	Pre-bud stage	Wet thoroughly.
SOW THISTLE, CANADA THISTLE, RUSSIAN KNAP- WEED & PEREN- NIAL PEPPER- GRASS	TBA (Benzoic)	10 to 20 lb/A	Bud stage	Residual effect 2 years or more
	Benzabor	1 to 1 1/2 lb/sq rd	Late fall or early spring	Apply dry. Erbon can be used for Russian knapweed control.
QUACKGRASS On fallow Patches	Dalapon	5 to 10 lb/A	Spring after 4 to 6 in. growth	Cultivate after 2 to 3 weeks.
	Dalapon	20 to 25 lb/A	4 to 10 in. growth	Use where cultivation after treatment not possible. There will be residual effect.
	Amitrole	8 lb/A	Actively growing	Cultivate after 3 weeks
AROUND BLDGS., TELEPHONE POLES, ETC.	Monuron, simazine Bromacil or similar products	See label	Anytime--all weeds	Heavy rates for complete long-time soil sterility.

^{1/} There are several soil sterilants that will do a very good job of perennial weed control. Follow directions of the manufacturer as they appear on the label.

^{2/} Use spreader sticker.

GLOSSARY OF CHEMICAL NAMES

Common Name	Chemical Name	Trade Name ^{1/} and Manufacturer
Amiben	3-amino-2,5-dichlorobenzoic acid	Amiben (Amchem Products)
Amitrole	3-amino-1,2,4-triazole	Amino Triazole Weed Killer (American Cyanamid) Weedazol (Amchem Products)
Amitrole-T	3-amino-1,2,4 triazole-ammonium thiocyanate	Amitrol-T (Amchem Products) Cytrol (American Cyanamid)
AMS	Ammonium sulfamate	Ammate X (Du Pont)
Barban	4-chloro-2-butynyl N-(3, chloro-phenyl carbamate)	Carbyne (Spencer)
Benzabor ^{2/}	Sodium borate-2,3,6-TBA mixture	Benzabor (U.S. Borax)
Bromacil	5-bromo-3-sec-butyl-6-methyluracil	Hyvar X (Du Pont)
CDAA	2-chloro-N, N-diallylacetamide	Randox (Monsanto)
CDAA-TCB	CDAA + trichlorobenzyl chloride	Randox-T (Monsanto)
Dalapon	2,2-dichloropropionic acid	Dowpon (Dow)
DATC	2,3-dichloroallyl diisopropylthiocarbamate	Avadex (Monsanto)
DATC-BW	2,3,3-trichloroallyl diisopropylthiocarbamate	Far-go (Monsanto)
Endothal	Disodium 3,6-endoxohexahydro-phthalate	Endothal, Aquathal (Penn Salt)
Erbon	2, -(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate	Baron (Dow)
MCPA	2 methyl-4-chlorophenoxyacetic acid (amine salts and esters)	Various
Monuron	3-(p-chlorophenyl)-1,1-dimethylurea	Telvar (Du Pont)
Simazine	2-chloro-4,6-bis(ethyl-amino)-s-triazine	Simazine 80W (Geigy)
TBA	2,3,6-trichlorobenzoic acid	Various
TCA	Sodium trichloroacetate	Various
2,4-D	2,4-dichlorophenoxyacetic acid (sodium and amine salts and esters)	Various
4-(2,4-DB)	4-(2,4-dichlorophenoxy) butyric acid (amine salts and esters)	Butyrac 118 (Amchem Products) Butoxone (Chipman)

^{1/} The mention of trade names does not imply that they are endorsed or recommended over those of similar nature not listed.

^{2/} Benzabor is a trade name. There is no common name for this chemical.

DEFINITIONS

Preplanting--applying the herbicide before planting the crop.

Preemergence--applying the herbicide after the crop is planted but before the crop or weeds have emerged.

Postemergence--applying the herbicide after the crop and weeds have emerged.

RECOMMENDED CIRCULARS for additional information on weed control are "Chemical Control of Wild Oats in Field Crops" (No. A-351), "Weed Sprayer Calibration" (No. AE-73), "Perennial Weed Control" (No. A-194), "Chemical Weed Control in Trees" (No. A-418) and "Weed Control in Lawns" (No. A-432). Secure copies from your County Extension Agent or from Agricultural Information Department, NDSU, Fargo.