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EC198 Revised 1959 2,4-D for Weed Control in Field Crops

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2,4-D

FOR WEED CONTROL IN FIELD CROPS

J. D. FURRER

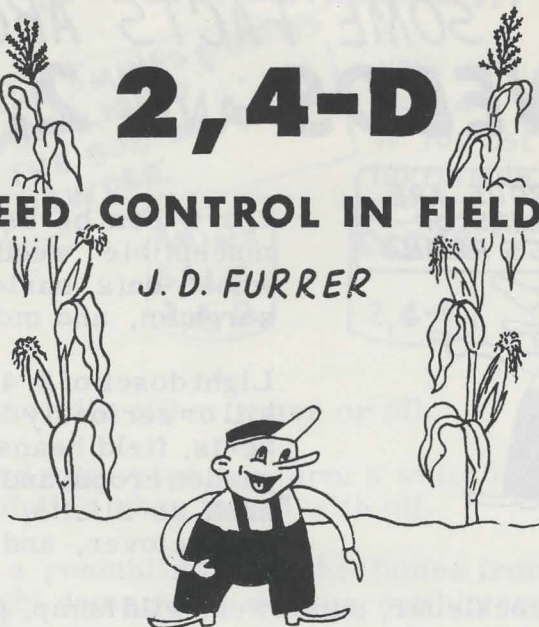


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EXTENSION SERVICE
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE
AND U. S. DEPARTMENT OF AGRICULTURE
COOPERATING
W. V. LAMBERT, DIRECTOR E. W. JANIKE, ASSOC. DIRECTOR

SOME FACTS ABOUT WEEDS AND 2,4-D

THESE CROPS ARE
ALL MEMBERS OF
THE GRASS FAMILY



2, 4-D can be used to control susceptible weeds in corn, wheat, oats, barley, rye, grain sorghum, and most grasses.

Light doses of 2, 4-D will often kill or seriously damage sugar beets, field beans, safflower, garden crops, and legume crops such as alfalfa, red clover, sweetclover, and soybeans.

- . Ragweed, cocklebur, sunflower, wild hemp, pigweed, and certain other broad-leaved annual weeds (page 8) are usually most easily killed with 2, 4-D --
 - . when they are less than six or eight inches tall
 - . when they are growing rapidly as a result of plenty of moisture, warm temperatures, and fertile soil.
- . 2, 4-D is usually effective on bindweed, hoary cress, thistles, and many other perennials if they are sprayed --
 - . when the first flower buds appear or during the early bloom stage
 - . when regrowth occurs in the fall.
- . Weeds susceptible to 2, 4-D are often hard to kill --
 - . during extended periods of low rainfall
 - . during long periods of extremely high or extremely low temperatures
 - . when they are growing on poor soil
 - . when they have become big, tough, and woody.
- . 2, 4-D is not poisonous to livestock.
- . It does not sterilize the soil when used as recommended.
- . It has no beneficial effect upon crops except weed elimination.

2,4-D is available in 3 types



THE AMINES & ESTERS
ARE LIQUID.....
THE SODIUM SALT
POWDER

VERY LITTLE SODIUM SALT
OF 2,4-D IS USED IN NEBR.
IF YOU USE IT FOLLOW THE
DIRECTIONS ON CONTAINER



ESTERS--

- . Can be used with either water or oil.
- . When mixed with water they form a white milky emulsion; a clear solution when mixed with oil.
- . There is a possibility that the fumes from some of the esters might damage nearby susceptible crops.
- . Low-volatile esters (forms which do not give off so many fumes) are available.
- . Rain immediately after spraying does not greatly reduce their effectiveness.
- . The amount of actual 2, 4-D present in the esters varies. Some of the more common amounts are 2.64, 3.00, 3.34, and 4.00 pounds of 2, 4-D acid per gallon.

AMINE SALTS--

- . Use only with water.
- . When mixed with water they form a clear solution.
- . They do not give off damaging fumes.
- . Rain within a few hours after application may reduce their effectiveness.
- . Nearly all the amines are being standardized at four pounds of 2, 4-D acid per gallon.

Amount of

2,4-D RECOMMENDED FOR WEED CONTROL IN

- CORN • BARLEY
- WHEAT • OATS
- RYE
- GRAIN SORGHUM
- GRASS FOR SEED

For the control of sunflowers, cockleburrs, pigweeds, ragweeds, bindweed, and many other broad-leaved weeds in corn, smallgrain, grass, and grain sorghum, use on each acre --

- . 1/2 to 1 pound 2,4-D acid of the amine salt forms
OR
- . 1/4 to 1/2 pound 2,4-D acid of the ester forms.



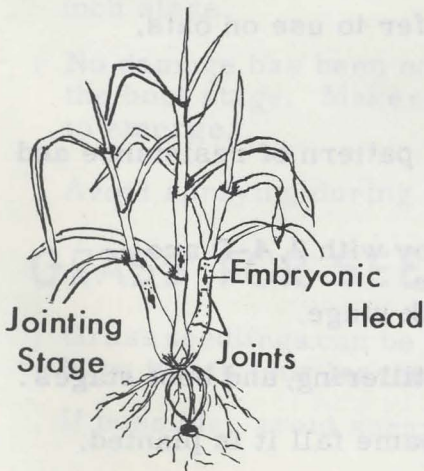
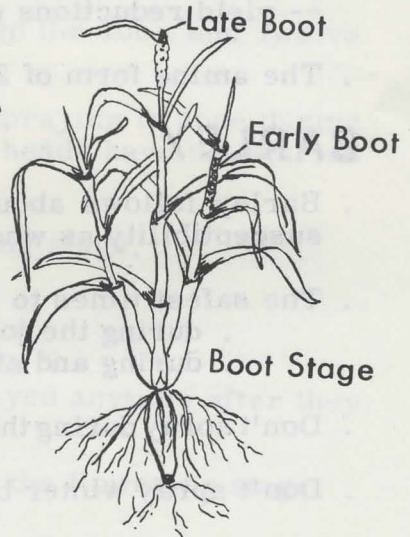
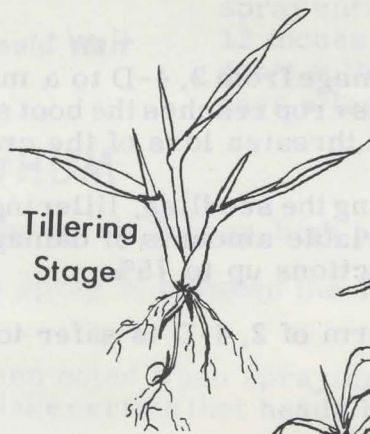
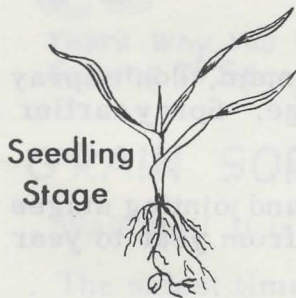
HERE'S A TABLE
WHICH CONVERTS
POUNDS OF ACID PER
ACRE TO PINTS PER ACRE

Pounds of 2,4-D acid in 1 gallon of commercial product	Pounds of 2,4-D acid in 1 pint	Pints of commercial product needed for each acre to give the following lbs. of 2,4-D		
		1/4 lb.	1/2 lb.	1 lb.
2.64	0.33	3/4	1 1/2	3
3.00	0.375	2/3	1 1/3	2 2/3
3.34	0.42	3/5	1 1/5	2 2/5
4.00	0.50	1/2	1	2
6.00	0.75	1/3	2/3	1 1/3

- . Use enough water to give good coverage --
 - . know how much water your sprayer puts on per acre (see Extension Circular 186), then
 - . add the correct amount of chemical
- . If possible, spray when the weeds are young and tender.
- . When growing conditions are favorable, use the lower rates of 1/2 lb. amine salt or 1/4 lb. ester.
- . Use the higher rates of 1 lb. amine salt or 1/2 lb. of ester --
 - . when growing conditions aren't so good
 - . when perennial weeds such as bindweed are present in the crop
 - . when weeds have started to become woody.

STAGES OF GROWTH AND GENERAL INFORMATION ON SPRAYING SMALL GRAIN

- . Generally speaking, the beneficial effects of weed elimination by the use of 2, 4-D in weedy grain will be greater than the possible crop damage from 2, 4-D.
 - . All small grain seems to be damaged to some extent by 2, 4-D
 - . The amount and type of damage varies from year to year.
- . Wheat, oats, and barley respond differently to the action of 2, 4-D at various stages of growth.
- . To minimize damage to the crop, it is important to learn what stages of growth the small grain crop is least and most damaged by spraying with 2, 4-D. Learn to recognize the various stages of growth drawn below.



SPECIFIC RECOMMENDATIONS FOR SPRAYING WHEAT (SPRING & WINTER) & RYE

- . Wheat appears to be less subject to 2, 4-D damage than barley and oats. Spraying during the most susceptible stages at recommended rates will probably cause less than a 10% reduction in yield.
- . The safest times to spray with 2, 4-D are --
 - . during the jointing stage (after the tillering stage)
 - . from the milk stage to maturity.
- . The greatest amount of 2, 4-D damage seems to occur when spraying is done --
 - . the same fall winter wheat or rye is planted
 - . during the early boot stage
 - . during the flowering stage.

OATS

- . To reduce damage from 2, 4-D to a minimum, don't spray before the oats crop reaches the boot stage. Spray earlier only if weeds threaten loss of the crop.
- . Spraying during the seedling, tillering, and jointing stages has given variable amounts of damage from year to year -- yield reductions up to 75%.
- . The amine form of 2, 4-D is safer to use on oats.

BARLEY

- . Barley follows about the same pattern of resistance and susceptibility as wheat.
- . The safest times to spray barley with 2, 4-D are --
 - . during the jointing stage
 - . during and after the milk stage.
- . Don't spray during the seedling, tillering, and boot stages.
- . Don't spray winter barley the same fall it is planted.

CORN

- . Try to direct the spray material onto the weeds and away from the corn stalks.
- . Corn less than 15 inches high is less likely to lodge or develop brittle stalks than taller corn.
- . If airplanes or "High Clearance Sprayers" are used for late season spraying, don't spray while the corn is shooting ears. Wait until the silks are dry.



IF THE BINDWEED HAS
A LOT OF LEAVES
AND RUNNERS, MORE
2,4-D IS ABSORBED

**That's Why You Should Wait
So Long To Spray**

. If spraying for bindweed control --

- . plant the corn in the usual manner,
- . substitute spraying for the first cultivation but wait to spray until the corn is 8 to 12 inches high.
- . don't cultivate for 7 to 10 days after spraying.

GRAIN SORGHUM

- . Wait until it is four to six inches high before spraying.
- . The safest time to spray is between the four and twelve inch stage.
- . No damage has been noted when spraying is done during the boot stage. Make certain that heads have not started to emerge.
- . Avoid spraying during the flowering stage.

GRASS FOR SEED

- . Grass seedlings can be safely sprayed anytime after they have two to four leaves.
- . If possible, avoid spraying during the flowering stage.

WEEDS COMMONLY FOUND IN CULTIVATED FIELDS

AND THEIR RESPONSE TO 2, 4-D

- S = Susceptible - tops readily killed by recommended rates of 2, 4-D at most stages of growth; roots frequently killed by one application.
- MR = Moderately resistant - tops partly or completely killed by 2, 4-D during early stages of growth; roots of perennials and biennials seldom eliminated except by repeated applications.
- R = Resistant - tops and roots only slightly injured by 2, 4-D, control by 2, 4-D not feasible.

Annual ragweed	S	Pennycress	S
Artichoke	S	Perennial ragweed	S-MR
Buffalo bur	R	Pigweed	S
Bull thistle	MR	Prickly lettuce	MR
Climbing milkweed	R	Plantain	S
Cocklebur	S	Puncture vine	S
Dock	S	Purslane	MR
Dogbane	MR	Round leaf mallow	MR
Field bindweed	S-MR	Russian knapweed	R
Giant ragweed	S	Sandbur	R
Ground cherry	R	Shepherd's-purse	S-MR
Gumweed	S	Smartweed, annual	MR-R
Hedge bindweed	S	Snow-on-the-mt.	S
Hoarycress	MR	Spurges	MR
Horse nettle	R	Stinging nettle	S
Kochia (fireweed)	S	Sunflower	S
Knotweed	MR-R	Tanweed	MR
Lambsquarters	S	Velvet leaf	S-MR
Leafy spurge	MR	Vervain	MR
Marestail	MR	Weedy grasses	R
Marsh elder	S	Western water hemp	S
Milkweed	R	Wild buckwheat	MR-R
Mustard	S	Wild hemp	S
Pasture thistle	MR	Wild rose	R

The above classification is based on average growing conditions, i. e., favorable temperatures, moderate soil fertility, and normal rainfall. A deficiency in rainfall or soil fertility or abnormally high or low temperatures may cause a susceptible plant to become resistant.