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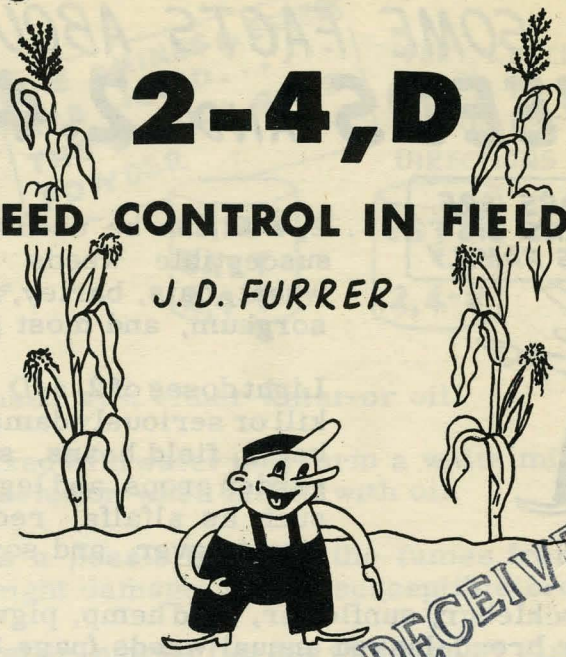
2-4,D

FOR WEED CONTROL IN FIELD CROPS

J. D. FURRER



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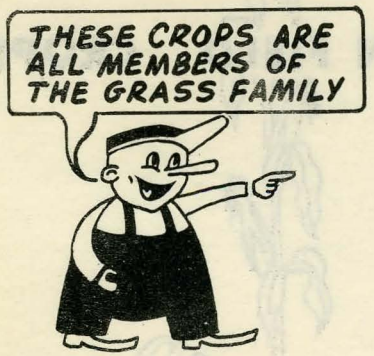
SOME FACTS ABOUT WEEDS AND 2,4-D



. 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.

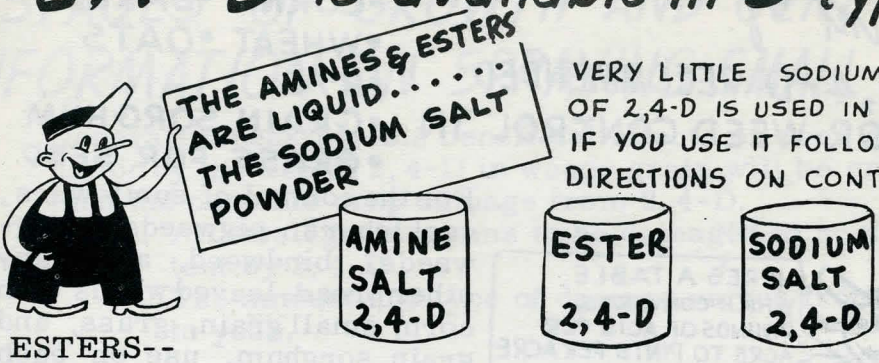
. Ragweed, cocklebur, sunflower, wild hemp, pigweed, and certain other broad-leaved annual weeds (page 8) are usually most easily killed with 2, 4-D --
  . when they are less than six or eight inches tall
  . when they are growing rapidly as a result of plenty of moisture, warm temperatures, and fertile soil.

. 2, 4-D is usually effective on bindweed, hoary cress, thistles, and some of the other perennials if they are sprayed --
  . during the early bloom stage or
  . when the plants have an abundance of lush, dark green foliage.

. 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



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 don't give off so many fumes) are available. Low-volatile material gives more crop damage than ordinary esters.

. 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, cockleburs, pigweeds, ragweeds, bindweed, and many other broad-leaved weeds in corn, small grain, 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.

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

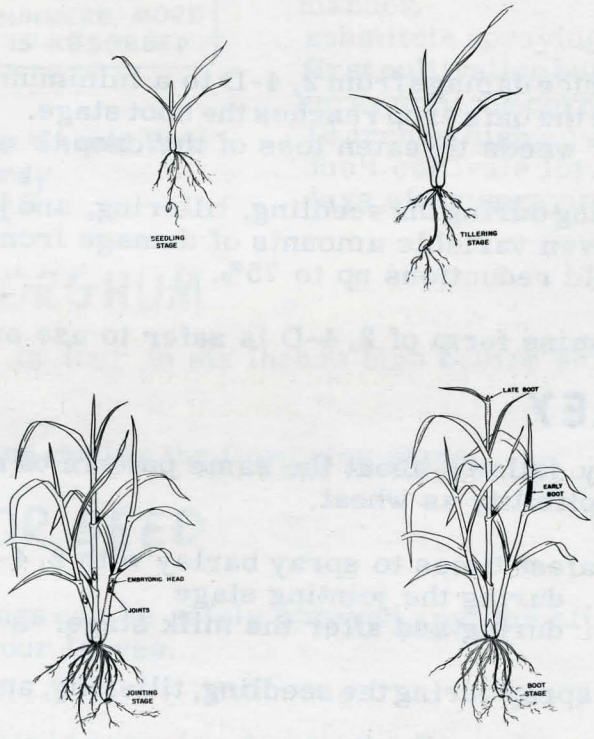
. If possible, spray when the weeds are young and tender.

. 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.

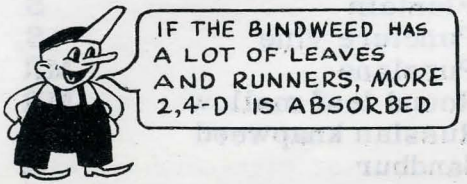
. Don't spray winter barley the same fall it is planted.

CORN

. Try to direct the spray material onto the weeds and away from the corn stalks.

. Corn less than 24 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.



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 12 to 18 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.

. 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.