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Chemicals that Control Weeds

— a guide for 1965 —

By Weed Science Personnel

KEYS to Pesticide Safety

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

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

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.

DISPOSE OF EMPTY CONTAINERS SAFELY. Burn paper bags and stay out of the smoke. Bury metal and glass containers in an isolated and safe distance from all water supplies. Puncture metal or plastic and break glass containers after placing in burial pit.

This bulletin deals principally with herbicides as an aid for crop production. Good farming practices including crop rotations, clean seed, adapted varieties, proper seedbed preparation, proper planting date and depth, adequate row and plant spacings, timely cultivation, and adequate fertilization are, as always, of prime importance if weed problems are to be kept to a minimum. Also, of paramount importance is the prevention of weed seed production.

Agricultural chemicals must not be used for purposes other than those specified by the approved label on the container. 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 make field applications when wind velocity exceeds 8 mph. Wind will cause poor coverage and excessive drift. BE ESPECIALLY CAREFUL WITH 2-4-D AND SIMILAR COMPOUNDS AROUND VEGETABLES, TREES, SHRUBS, AND OTHER BROADLEAF CROPS.

This circular gives suggestions for chemical weed control based on research results at the Nebraska Agricultural Experiment Station and elsewhere.

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University of Nebraska College of Agriculture and Home Economics and U. S. Department of Agriculture
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E. F. Frolik, Dean; E. W. Janike, Director

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 surface soil. To overcome dependence on rainfall and to increase dependability, preemergence herbicides should be incorporated into the surface soil with a suitable implement. Excessive rainfall may leach some of the more soluble herbicides too deeply, especially on sandy soils. Soils high in organic matter or clay content generally require more herbicide than do sandy soils for equivalent weed control. 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. Do not use atrazine on land that will be planted to crops other than corn or sorghum the following year—it may carry over and injure sugar beets, beans, potatoes, alfalfa, and small grain. Herbicide residue problems in soils increase as one goes westward in Nebraska. Handle Randox with care to avoid irritation.

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

FIELD CROPS—PREPLANT AND PREEMERGENCE

A 13-inch band application will reduce the total herbicide used in 40-inch rows by two thirds.

Crop	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product/A	Application time	Remarks
Castorbeans	CDAA	5	25 lb Randox granules	Preemergence	Do not use on sandy soils.
	EPTC	2	1⅓ qt Eptam	Preplant or preemergence	Immediately incorporate by double disking or equivalent soil mixing.
Corn	atrazine	2 to 3	2.5 to 3.75 lb Atrazine 80W	Preemergence	On sandy soil use only atrazine and at 2 lb/A. Atrazine does not control fall panicum or late emerging crabgrass.
	CDAA + TCBC	3½ + 7	30 lb Randox T granules		
	2,4-D ester	1 to 1½	1 to 1½ qt[3]		
Field beans	EPTC	3	2 qt Eptam	Preplant	Immediately incorporate into the soil by double disking.
Sorghum	atrazine	2	2½ lb Atrazine 80W	Preemergence	Do not use on sandy soils or soils low in organic matter. Heavy rains may leach either herbicide and cause injury to sorghum.
	CDAA	5	25 lb Randox granules		
Soybeans	amiben	3	6 qt Amiben	Preemergence	Incorporate amiben with rotary hoe.
	CDAA	5	25 lb Randox granules		
	trifluralin	1	1 qt Treflan	Preplant	Immediately incorporate by double disking or equivalent soil mixing.
Sugar beets	PEBC	3 to 5	2 to 3⅓ qt Tillam	Preplant	Immediately incorporate by a hooded, power-driven incorporator to 1 to 2 inches. Use higher rate (5 lb/A) on clay soils. TILLAM DOES NOT CONTROL KOCHIA.

FIELD CROPS—POSTEMERGENCE

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

Crop	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
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. **Spray field pennycress and mustards before April 15.**
Corn	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 to reduce corn injury.

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Crop	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Flax	dalapon MCPA	1 ¼	1¼ lb Dowpon ½ pt[3]	Before weeds are 1½″ tall	Dowpon (for grasses) and MCPA (for broadleaves) may be mixed.
Oats	2,4-D amine MCPA	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.
Sorghum	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 the stage from 13″ through early boot may inhibit head development.
Sugar Beets	dalapon	2 to 4	2½ to 5 lb Dowpon	Grassy weeds less than 2″ tall	For annual grasses. Use higher rate (4 lb/A) on grass taller than 2″.
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. Spray field pennycress and mustards as soon as good growing conditions occur.

PASTURES, RANGES, AND FORAGE CROPS

Area or use	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Alfalfa and birdsfoot trefoil seedlings	dalapon	2 to 3	2½ to 3¾ lb Dowpon	2 to 4 weeks after alfalfa emerges when grass seedlings are less than 2″ tall	For annual grasses. Do not sell first year's crop or feed treated forage to dairy cows or animals being finished for slaughter. Can be mixed with 4-(2,4-DB).
	4-(2,4-DB)	1	2 qt 2 lb/gal amine	When weeds are small	For broadleaf weeds. Do not use treated forage for 30 days. DO NOT CONFUSE WITH 2,4-D.
	EPTC	3	2 qt Eptam	Preplant	Incorporate into the soil by double disking. Do not graze forage within 60 days of treatment. Early legume injury may occur.
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]		
Warm-season grasses for seed	atrazine, diuron, or monuron	3	3.75 lb 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 broadleaf weeds in pastures and ranges	2,4-D	1	1 qt[3]	When weeds are small	Treat biennials and winter annuals such as musk thistle and field pennycress in the fall.
Perennial broadleaf weeds in pastures and ranges	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.

NON-CROP AREAS

Area or use	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
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 2,4,5-T at 1 lb/A for wild rose and horse nettle.
Irrigation ditchbanks	diuron or monuron	8	10 lb Karmex or Telvar	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. Agitation required.
	atrazine or simazine	6	7½ lb Atrazine 80W or Simazine 80W		

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Area or use	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Soil sterilant for drives, storage areas, industrial sites, parking lots, fence lines, etc.	atrazine or simazine	10	12.5 lb Atrazine 80W or Simazine 80W	Follow manufacturer's recommendations	Complete control of annuals, biennials, and most perennials. Consider possible damage to nearby trees, shrubs, and grass and possible movement of sterilant with water and wind before herbicides are leached into the soil.
	bromacil	5	6¼ lb Hyvar X "80W"		
	diuron or monuron	10 to 20	12.5 to 25 lb Telvar or Karmex		
	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		
	bromacil plus others		No. of mixtures		
	chlorate-borate		Polybor-chlorate, Chlorax, and Atlacide		
	chlorate-borate-monuron		Chlorea and Monobor-chlorate		
	simazine-amitrole		Amizine		
	silvex-dalapon		Garlon	Early weed growth	

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, dicamba, or silvex	1	1½ tbs[3]/gal of water/1000 sq ft Banvel D or Kuron	Fall or spring	AVOID drift on desirable broadleafs. DO NOT use ester formulations of 2,4-D as damaging fumes drift unpredictable distances. Spray when calm. Check with neighbors before spraying.
Chickweed, henbit, violets, and knotweed	dicamba or silvex	1	1½ tbs[3]/gal of water/1000 sq ft Banvel D or Kuron	Fall or spring	Use enough water to insure good coverage.
Crabgrass, foxtail, and other annual grasses	DCPA or DMPA	Follow manufacturer's recommendations with Dacthal and Zytron		Preemergence to weeds in the spring	Use only on established grass. Rake lawn prior to application and water in.
Crabgrass	AMA or DMA	Follow manufacturer's recommendations. Organic arsenics		Postemergence	POISONOUS. Repeat treatment every 7 days for 2 or 3 applications. Also effective on foxtail. May temporarily discolor bluegrass.
	kerosene		1 qt/100 sq ft	Postemergence, 2 to 4 leaves on crabgrass	Use white kerosene. Do not dilute. Apply when temperature is below 90° F.
	PMA		3 oz of 10% material/1000 sq ft	Postemergence, 2 to 4 leaves on crabgrass	POISONOUS. Repeat treatment every 7 days for 3 applications. Also controls certain diseases. Injurious to Merion bluegrass.
Nimblewill	DMA or AMA plus 2,4-D	DMA or AMA rates suggested on container for crabgrass control plus 2,4-D at dandelion rate		When growing vigorously in June and July	Thoroughly wet all plants. Repeat applications 3 times at intervals of 7 to 10 days.
	DMPA	Follow label recommendations on liquid Zytron container			

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Weed	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Smooth bromegrass	dicamba	2	3 tbs[3] Banvel D/gal of water/1000 sq ft	Fall or spring	Thoroughly wet all plants. Repeat treatments may be needed. Avoid spraying around shrubs and trees.
White clover	dicamba, silvex, or 2,4-5-T	1	1½ tbs[3]/ gal of water/1000 sq ft Banvel D or Kuron	Fall or spring	Repeat treatments may be necessary.

TROUBLESOME WEEDS AND WOODY PLANTS

Follow-up Treatments Are Necessary To Kill Escaped Established Plants And New Seedlings

Weed	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Buckbrush (western 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.
Canada thistle	2,4-D	2	2 qt[3]	Fall (rosette) and spring (early bud)[2]	Same as for field bindweed.
	picloram	2	1 gal Tordon 22K	Fall or spring on vigorous growth[2]	Do not disturb for 1 to 2 weeks after treatment.
	2,3,6-TBA and PBA as listed for field bindweed control.				Do not use in wet areas.
Cottonwood, willows, and Chinese elm	2,4-D ester	2 to 3	2 to 3 qt[3]	Full foliage[2] (early June)	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 run-off.
Downy brome	atrazine	2	2.5 lb Atrazine 80W	Preemergence (fall or spring prior to April 1)	Use only in waste areas such as fence rows and ditchbanks. Do not use on cropland. Use sufficient water to insure good coverage.
	atrazine+amitrole monuron+amitrole	1+½ 1+½	1.25 lb Atrazine 80W or Telvar plus 1 lb of Amino Triazole or Weedazol	Postemergence in spring prior to April 10	
Field bindweed	2,4-D	1	1 qt[3]	Vigorous fall growth or bud stage in spring[2]	Avoid tillage 10 weeks before and 1 week after application. Plan to treat for several consecutive years.
	picloram	2	1 gal Tordon 22K	Fall or spring on vigorous growth[2]	Do not disturb for 1 to 2 weeks after treatment.
	fenac	20	⅝ pt/sq rd	Fall or spring[2]	Do not disturb except for shallow incorporation. Fall application more effective. High summer temperatures reduce effectiveness. Follow up treatments with 2,4-D applications on seedlings and escapes.
	PBA	40	10 gal/A or ½ pt/sq rd of 4 lb/gal polychlorobenzoic acid		
	2,3,6-TBA	20	1½ lb/sq rd Granular TBA or ½ pt/sq rd Benzac 1281, Trysben 200, Tritac, or TBP		
Franseria (Bur ragweed)	2,4-D	2	2 qt[3]	During June[2]	Same as for field bindweed except amine formulations less effective. If soil moisture conditions are poor, use oil-water emulsions as a carrier.
	picloram	2	1 gal Tordon 22K	Fall or spring on vigorous growth[2]	Do not disturb for 1 to 2 weeks after treatment.
	2,3,6-TBA and PBA as listed for field bindweed.				

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Weed	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Hoary cress (perennial peppergrass)	2,4-D	2 to 4	½ to 1 gal[3] emulsifiable forms	Rosette stage in the fall or early bud in spring[2]	Same as for field bindweed except amine formulations less effective.
	2,3,6-TBA and PBA as listed for field bindweed control.				
Indian hemp (Dogbane)	2,4-D ester	1	1 qt[3]	Bud stage[2]	Use lower rates in crops.
Johnsongrass	dalapon	5	7 lb Dowpon	8 to 12 inches new growth or regrowth[2]	Repeat treatment 3 times, 10 to 20 days apart.
	TCA	80	100 lb Sodium TCA	Early spring[2]	Use enough water to insure good coverage. Retreat escaped plants.
Leafy spurge	2,4-D	2	2 qt[3] emulsifiable forms	Early bud stage in spring or late fall[2]	Same as for field bindweed except amine formulations less effective.
	dicamba	10	2 oz Banvel D/sq rd	Fall or spring[2]	Same as for 2,3,6-TBA.
	fenac	16	½ pt Fenac/sq rd	Fall or spring[2]	Same as for 2,3,6-TBA.
	picloram	2	1 gal Tordon 22K	Fall or spring on vigorous growth[2]	Do not disturb for 1 to 2 weeks after treatment.
	2,3,6-TBA and PBA as listed for field bindweed control.				
Milkweed, common	amitrole	4	8 lb Amino Triazole or Weedazol	Bud to bloom stage[2]	Use enough water to insure good coverage.
Musk thistle	2,4-D	1	1 qt[3]	Late fall treatment of rosettes and 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.
Poison ivy	amitrole		2 tbs Amino Triazole or Weedazol/gal water	Full foliage (June)[2]	Thoroughly wet all vegetation.
	AMS		¾ lb Ammate X/gal of water		
	2,4,5-T or 2,4-D+2,4,5-T		2 tbs[3] per gal of water		
Puncture vine	2,4-D ester	1	1 qt[3]	Pre-bud stage most effective	Mature burs not affected by 2,4-D.
Ragweed	2,4-D	1	1 qt[3]	Early summer[2]	Follow-up treatments may be necessary.
Russian knapweed	2,4-D	2	2 qt[3] emulsifiable forms	Early bud stage[2]	Same as for field bindweed except amine formulations less effective.
	picloram	2	1 gal Tordon 22K	Fall or spring on vigorous growth[2]	Do not disturb for 1 to 2 weeks after treatment.
	2,3,6-TBA, Fenac, and PBA as suggested for field bindweed.				
Russian olive	2,4-D+2,4,5-T	1+1	2 qt[3]	Full foliage[2] (early June)	Same as for cottonwood.
Sagebrush (sand or green)	2,4-D ester	1	1 qt[3]	4 to 8 inches new growth (June)[2]	Same as for buckbrush.
Shattercane	EPTC	3	2 qt Eptam	10 days prior to corn planting	Incorporate immediately by double disking or equivalent soil mixing. Some crop injury may result.
	trifluralin	1½	1½ qt Treflan	Preplant on soybeans	
	EPTC+2,4-D	2+1	2 qt Knoxweed 42	Preemergence on corn	Soil incorporation beneficial. Some crop injury may result.
Tanweed	2,4-D ester	1	1 qt[3]	When growing vigorously[2]	Controls top growth principally. Repeat treatment necessary.
	picloram	2	1 gal Tordon 22K	Fall or spring on vigorous growth[2]	Do not disturb for 1 to 2 weeks after treatment.
Wild rose	2,4,5-T	1 to 2	1 to 2 qt[3]	Late spring or early summer[2]	Follow-up treatments may be necessary.
Yucca	silvex	2	2 qt Kuron	June[2]	Use diesel as a carrier.

TREES AND SHRUBS

Herbicides are an effective and efficient way of controlling weeds in tree and shrub plantations and in nursery line-out beds. Herbicides listed are capable of causing tree injury. However, they can be used safely. Rates of application should be strictly observed. Herbicides are recommended for control of weeds near the trees where machine cultivation is difficult or impossible. They may be applied as a circular band around the tree trunk or in bands along the tree row. A 40-inch band, 20 inches on either side of the tree row, has proved satisfactory in row plantations. Conventional machine cultivation or mowing should be used to control weeds between the rows.

Preemergence herbicides rely on moisture in the form of precipitation or sprinkler irrigation to incorporate the herbicide into the soil surface for effective weed control. Tree injury is sometimes experienced on sandy soils or those low in organic matter if heavy rainfall occurs shortly after herbicide application. The minimum herbicide rate listed is recommended for sandy soils.

Herbicides should be applied only after the trees are planted. For most of the preemergence herbicides listed here, only one application at the beginning of the growing season is recommended. Granular formulations of herbicides generally are not as satisfactory as spray formulations. In new plantations the soil should be firmly packed around the trees and free of clods and surface irregularities. A depression along the tree row caused by a mechanical tree planter may result in dangerous concentration of chemical near the tree after a heavy rain.

ORCHARDS

Crop	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Apples, peaches, and pears	dalapon	1 lb Dowpon in 15 gal water used as a wetting spray		Postemergence, grass 1 to 10″ tall	Grass control only. Use only on trees over 4 years old. KEEP SPRAY OFF TREE FOLIAGE.
Apples, pears, and cherries	simazine	2 to 4	2.5 to 5 lb Simazine 80W	Preemergence to weeds	Use lighter rate (2 lb/A) on sandy soils. Apply a 20″ band on each side of tree row. Use on trees established 1 or more years.

WINDBREAKS, CONIFERS, FOREST PLANTATIONS, ORNAMENTALS, AND NURSERY LINERS

Crop or use	Herbicide	Lbs active ingredient[1] needed per acre	Apply this amount commercial product	Application time	Remarks
Trees	dalapon	1 lb Dowpon in 15 gal water used as a wetting spray		Postemergence, grass 1 to 10″ tall	Grass control only. Use only on trees established 1 or more years. KEEP SPRAY OFF TREE FOLIAGE.
Trees	paraquat	½ to 1	1 to 2 qt Paraquat	Postemergence	A non-selective contact herbicide. Use sufficient water to cover weed foliage. KEEP SPRAY OFF TREE FOLIAGE.
Conifers, honey locust, and green ash	diuron	2 to 4	2.5 to 5 lb Karmex	Preemergence to weeds	Use lighter rate (2 lb/A) on sandy soils. Apply a 20″ band on each side of tree row after trees are planted. Some injury to trees may result.
Trees and shrubs	simazine	2 to 4	2.5 to 5 lb Simazine 80W		

[1] Refers to acid equivalent, phenol equivalent, or active ingredient as applicable.

[2] Retreatment may be necessary.

[3] Calculated on the basis of 4 lb/gal of active material. For other formulations see conversion table at right.

CONVERSION TABLE

Lb. of Active Ingredient Per Gal. of Commercial Product	Pints of Commercial Product Needed Per Acre to Give the Following Pounds 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	2
6.00	⅓	⅔	1⅓

CALIBRATION OF EQUIPMENT

Calibrate equipment before using to make sure that it will apply the desired amount of herbicide per acre. Thoroughly clean and check equipment to see that all parts are working. Select the speed at which the equipment is to be operated and drive around in the field to be sure that everything is working properly. Calibrate on ground that has the same compaction as ground on which the equipment will be used.

Thoroughly clean all equipment immediately after use.

Sprayers

The number of gallons per acre a sprayer will discharge depends upon the ground speed, nozzle pressure, spacing of the nozzles, and size of nozzle opening (orifice). Herbicide formulations, spray carrier, and temperatures also affect spray discharge. The use of 80° or 110° nozzle tips will allow spraying closer to the ground and thereby reduce spray drift. Wettable powders will settle out if allowed to remain in spray tank without continuous agitation.

Calibrating Broadcast Type Sprayers

1. Measure the effective width of the boom in feet. (Number of nozzles times the spacing between any two adjacent nozzles.)
2. Set fan type nozzle height so there is a 50 percent overlap of the spray pattern or follow the manufacturer's recommendation.
3. Divide the width of the boom into 43,560 (the number of square feet in an acre) to get the number of feet of travel necessary to cover one acre.
4. Measure and stake off the number of feet you need to travel for one acre. (A fraction of an acre such as ¼ or ½ can be used.)
5. Fill the supply tank and boom with clean water at the starting point to get an approximate calibration. Final calibration should be made with spray solution.
6. Spray the measured area exactly as you would in the field, using the same speed and pressure.
7. When you get to the end of the course immediately shut off the sprayer.
8. Measure carefully the number of gallons required to refill the spray tank. This is the volume of water the sprayer will deliver per acre—or fraction of acre as you determined in step 4. Final calibration should be made with spray solution.
9. Use this calibration information to determine the amount of herbicide to apply to a given volume of water in the spray tank. Assume that you determined your sprayer applies 18 gallons per acre. If you want to spray three pounds of Eptam (6 lb/gal) per acre, add one-half gallon of Eptam to each 17½ gallons of water in the spray tank.

Calibrating Band Sprayers

Most principles involved in broadcast sprayer calibration also apply to band applicators. For band spray application use "E" type orifice tips. They deliver the same amount of spray material over the entire width of the spray pattern.

With 40″ row spacing on a planter, 13,080 feet of row are required for one acre. Traveling a distance of 327 feet with a 4-row planter is one-tenth of an acre (327 x 4=1308).

Begin band sprayer calibration by attaching plastic bags or other containers to each nozzle to catch its output. Assume your equipment is 4-row, you travel 327 feet and collect a total of one gallon of water from the four nozzles. The one gallon represents an application of one-tenth of an acre; therefore your sprayer is applying 10 gallons per acre on a broadcast basis. (If the nozzles were placed high enough the ten gallons would be sprayed over all the surface soil.) Nozzle height is an important factor in determining the dosage.

Carefully adjust the distance between the nozzles and the surface soil to obtain the desired spray band width. Adjusting the nozzle height so the 10 gallons of water is applied to a 20-inch band concentrates the spray on one-half the area so the application rate becomes 20 gallons per acre on the area sprayed; a 13-inch band concentrates the spray on one-third the area so the rate becomes 30 gallons per acre on the area sprayed; and a 10-inch band concentrates it on one-fourth the area making a rate of 40 gallons per acre.

Now add your herbicide at the recommended dosage rate. (Final calibration should be made with spray solution.) Assume you are using amiben at 3 pounds per acre for preemergence weed control in soybeans. You determined your equipment is applying 30 gallons of water per acre sprayed in the 13-inch band. Add 6 quarts (1½ gallons) of amiben (2 pounds of active ingredient per gallon) to each 28½ gallons of water in your spray tank to obtain the proper mixture.

Granular Applicators

The calibration of band applicators for granular herbicides is similar to band spray calibration. There is one main difference—there is no adjustment for band width.

Set the rate control adjustment as suggested by the manufacturer. Add granules to the hopper. Attach bags or other containers so they collect all granules discharged by the applicator. If your unit is 4-row with 40″ spacing travel 327 feet (this represents one-tenth acre). Remove the collecting containers (they should all contain approximately the same amount) and carefully weigh together all the granules collected.

Assume you collected 4 ounces of granules. Your applicator is applying 4 x 10 or 40 ounces (2½ pounds) of granules. In case the rate should be increased or decreased change the rate control adjustment and recalibrate.