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NebGuide

PUBLISHED BY COOPERATIVE EXTENSION SERVICE
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA - LINCOLN

G76-294
(Revised March 1986)

Band Application of Herbicides

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Many row crop producers prefer to use herbicide band applications because of reduced costs. Savings can be substantial with the more expensive materials. Properly applied, band applications of herbicides can satisfactorily protect the crop from weed growth. Herbicide row banding can be done either at crop planting time or postemergence after the crop and weeds have emerged.

Planting Time Row Banding

Herbicide selection. Herbicides that must be soil incorporated are usually not applied in row bands. Instead, they are broadcast and incorporated with a disk, field cultivator, or other tillage implement. Eradicane, Sutan+, Genep, and Genate Plus are corn herbicides that are usually broadcast and soil incorporated. Soybean herbicides that are usually broadcast and incorporated are Prowl, Sonalan, Treflan, and Vernam/Reward. All of these herbicides can be row banded and incorporated with a rotary strip-tiller during the planting operation, or they can be broadcast and incorporated.

Preemergence herbicides that do not require soil incorporation are suitable for row banding. Among these are atrazine, Bladex, Dual, Lasso, Lexone, Lorox, and Sencor, each of which may be applied alone or in various combinations. Granular herbicides are nearly always applied as a row band with the planter.

Band width. Nebraska research indicates that for corn and grain sorghum, a 7-inch herbicide band plus rotary hoeing and cultivation was as effective for weed control as were wider herbicide bands. For soybeans, a 14-inch herbicide band was required *(Table 1)*.

Some producers in the Nebraska Panhandle are experimenting with 7-inch herbicide bands on sugarbeets and fieldbeans. Clean tillage is practiced in that area, permitting cultivation very close to the crop row. With conservation tillage, however, the greater amount of crop residue left on the soil surface is more likely to interfere with cultivation close to the row. In many situations, a 12- to 14-inch herbicide band is compatible with other cultural practices. Herbicide cost can be reduced by two-thirds using a 12-inch band on 36-inch spaced crop rows.

Herbicide band applications are well suited to strip tillage crop planting systems. A clean tilled strip 10 to 14 inches wide is created by wide sweeps, double disk furrow openers, flat disks, or by rotary strip tillers mounted ahead of the planting unit. Herbicide is then banded on residue-free, freshly worked soil. Strip tillage performed on the old row ridge is called ridge-till. The intent is to push a small amount of soil and residue from the previous crop row into the furrow between the crop rows. Surface weed seeds are also moved out of the crop rows. Research at North Platte showed that ridge-till planting left only 30 percent as many weed seeds in the crop row as when the seedbed was prepared by plowing, disking, and harrowing. Using the ridge plant system with subsequent cultivation, farm operators have greatly reduced their shattercane problems. Ridge planting is also very effective where corn ear drop has occurred and a volunteer corn problem is expected.

Table 1. Dryland crop yields at the Northeast Research and Extension Center, Concord, NE comparing broadcast or band width applications of a preemergence herbicide.

	Crop yield (bu/A)		
*Treatment**	*Corn*	*Sorghum*	*Soybeans*
Untreated	100	78	25
7-inch band	114	105	30
14-inch band	107	109	34
21-inch band	114	110	33
Broadcast	116	109	36

*Plots were rotary hoed and cultivated once.

Postemergence Band Application

Many of the new herbicides being developed are for postemergence application. Cost per acre can be reduced by row banding the herbicide plus cultivating the row middles. Band application of postemergence herbicides

may be of two types: 1) over the top of the crop row, or 2) post directed to the base of the crop plant.

Over the top of the crop row. Herbicides that are relatively expensive to apply broadcast are likely candidates for over the row banding. The most critical factors necessary for successful over the crop row application of herbicides are as follows.

1. *Herbicide selection.* Herbicides registered for postemergence use in corn, grain sorghum, and soybeans are listed in *Table 2.* Carefully select the herbicide to match the weed species present in the field. Refer to the current edition of EC-130, "A Guide for Herbicide Use in Nebraska," for more detail on susceptibility of weed species to specific herbicides. In many cases, the product labels do not specifically describe row banding as an alternative to broadcasting. If applied properly, however, comparable weed control to that from broadcasting should be achieved with over the row banding.

2. *Proper spray boom setup.* Coverage of weeds with the herbicide solution is critical. This is especially true when applying contact herbicides such as Basagran and Blazer. *Figure 1* shows one way that spray nozzles can

Table 2. Registered herbicides for over top of the crop row application to corn, grain sorghum, and soybeans.

Herbicide	*Commercial Product Broadcast Rate per Acre*	*Remarks*
CORN or GRAIN SORGHUM		
Atrazine 4L* + oil	2-2.4 qts + 1 qt	Grass weeds must be 1.5 inches or less in height; broadleaf weeds up to 6 inches for some species, such as lambsquarters. Do not use on sorghum on sandy soils.
Basagran	1.5-2 pts	Apply at weed sizes listed on the product label, which will correspond to crop growth stages of 1 to 5 leaves.
Basagran + Atrazine 4L*	0.5-0.75 pt + 0.5-0.75 pt	Will improve control of weeds such as common lambsquarters, pigweed, and common ragweed. Add 1 qt/A crop oil concentrate.
Brominal ME4 or Buctril 2EC	0.5-1 pt or 1-1.5 pts	Apply to crop in 3- to 8-leaf stage, and susceptible weeds no larger than 4-leaf stage. 2,4-D at 0.5 pt, or atrazine 4L at 1 qt/A, may be tank mixed for broader spectrum weed control. Uniform spray coverage essential. Use 10 or more gals spray per acre with at least 30 psi nozzle pressure.
CORN		
Bladex 80W or Bladex 90DF	1.5-2.5 lbs or 1.3-2.2 lbs	Adjust application rate for soil type. Apply in water solution; do not apply in a liquid fertilizer carrier. A surfactant or emulsible vegetable oil (not a petroleum based oil) may be added under dry, low humidity conditions. Apply from corn emergence to fourth leaf stage but before weeds are 1.5 inches in height. *Do not use Bladex 4L.*
Bladex 80W + Atrazine 80W	1-1.75 lbs + 0.5-0.75 lb	See remarks under Bladex 80W section. Bladex 90DF or Atrazine 90DF can be substituted for the 80W formulations where 1.1 lb 90 DF = 1.25 lb 80W.
Bladex 80W or Bladex 90DF + Banvel	1.5-2.5 lbs or 1.3-2.2 lbs + 0.5-0.67 pt	Do not apply with a surfactant or emulsible vegetable oil.
SOYBEANS		
Amiben DS + Crop oil	3.6 lbs + 1 qt	Do not apply later than 33 days after planting. Weeds should be no taller than 4 inches. Use at least 10 gals water per acre and 30 psi nozzle pressure.
Amiben DS + Blazer	3-3.6 lbs + 1.5-2 pts	Will control all weeds listed on the Blazer label, including morningglory and Eastern black nightshade. Do not use crop oil with this treatment except for control of velvetleaf. Surfactant may also be used.
Amiben DS + 2,4-DB	3-3.6 lbs + 2-3 ounces	This treatment may cause temporary curling or malformation of soybean leaves and stems. Weed size must be 4 inches or less. 1 pt/A crop oil may improve weed control, but may also increase soybean injury.
Amiben DS + Alanap	3-3.6 lbs + 2-3 qts	Apply up to sixth trifoliate leaf stage but no later than 33 days after soybean planting. Addition of 1 qt/A crop oil may increase control of larger weeds.
Basagran alone or Blazer alone or Basagran + Blazer	1.5-2 pts or 1.5-2 pts or 1.5-2 pts + 1-2 pts	Use a minimum of 20 gals/A spray solution and 40 psi pressure with hollow cone or flat fan nozzles. Add 1-2 pts/A crop oil with Basagran alone or tank mixed. A surfactant at 1 pt/100 gals of spray mixture is usually specified for Blazer applications. Tank mixes of Basagran + Blazer give broader spectrum weed control than either product used alone. Cultivation before or during herbicide application may put weeds under stress and result in reduced control. For better control of velvetleaf, 1 gal/A of 28% Nitrogen solution or 1 qt/A 10-34-0 fertilizer may be substituted for the crop oil.
Basagran + Blazer + Poast	1-2 pts + 1-2 pts + 1-1.5 pts	May be applied as a three-way mix or sequentially, depending on weed sizes. If Basagran + Blazer is applied first, wait 7 days before applying Poast for best grass control. The rate of Poast should be increased 50% if tank mixed with Basagran or Blazer. Always add 1 qt/A crop oil with application of Poast or Basagran. Do not substitute 28% Nitrogen for crop oil when Poast is included in tank.

Table 2 (continued).

Herbicide	*Commercial Product Broadcast Rate per Acre*	*Remarks*
Blazer + Poast or Blazer + Fusilade 2000	1.5-2 pts + 1.5 pts or 1.5-2 pts + 0.75-1.5 pts	Tank mix or apply sequentially. Poast rate should be increased 50% if tank mixed with Blazer. The Fusilade label does not suggest a rate increase when tank mixing with Blazer. If Blazer is applied first, allow a minimum of 7 days before applying Poast, or wait until grass resumes growth to apply Fusilade. If the grass herbicide is applied first, do not apply Blazer within 3 days of Fusilade application or 1 day after Poast application. Use 1 qt/A crop oil with Poast or Fusilade.
Blazer + 2,4-DB	1.5-2 pts + 2 ounces	Increases control of susceptible weeds compared with use of Blazer alone. Addition of a surfactant will increase weed control. Do not use crop oil. Will cause soybean injury and may decrease soybean yield.
Basagran + 2,4-DB	1.5-2 pts + 2 ounces	For control of morningglory vines less than 10 inches long. Do not use oil or any other additive. Soybean injury and yield loss could occur.
Poast or Fusilade 2000	1-1.5 pts 0.75-1.5 pts	Apply rate as shown on product label for grass weeds to be controlled. Add 1 qt/A crop oil. A nonionic surfactant at 0.25% (v/v) can be used with Fusilade.
Dyanap	1.5-2 qts	Apply in 8 to 10 gals of water at 40-60 psi pressure after first tri-foliate leaf stage. Control limited to cocklebur, ragweed, sunflower, pigweed, and annual morningglory. Rate can be increased up to 4 qts/A for later applications up to 3- to 6-inch weed height.
Rescue	2-3 qts	Apply when soybeans are about 18 inches tall or after first bloom. Use 10-25 gals spray solution and 40-50 psi nozzle pressure. Hollow cone nozzles are suggested.

*Additional formulations are available. Use rates that give comparable amounts of active ingredient: 1 qt Atrazine 4L = 1.25 lb Atrazine 80W or 1.1 lb Aatrex Nine-O.

be attached to the spray boom. In *Figure 2,* herbicide is being aplied over the top of the soybean row with a three-nozzles-per-row unit. Many commercial row band units are available on the market; choose one that is made from non-corrosive, non-breakable material.

3. *Proper spray nozzles, water volume, and pressure.* Two or three nozzles per row are recommended to achieve complete foliar coverage *(Figure 2).* Use 80 degree hollow cone or 80 degree flat fan even spray nozzle tips. Water volume used is one gallon of water per inch of band. The spray pressure should be no lower than 40 pounds per square inch where thorough coverage of the weed leaf surface is required. Refer to NebGuide G84-700, "Factors Affecting Foliar-Applied Herbicides," for additional information.

4. *Proper timing of herbicide application.* Most post-emergence herbicides should be applied 25 to 35 days after crop planting. Soybeans will generally be in the first to third trifoliate leaf stage at that time. Corn and grain sorghum should be in the two-leaf to about 14-inch height. As crop canopy density increases, it is harder to get complete herbicide coverage of the weeds. In all cases, apply the herbicide according to the weed size stated on the product label.

Post directed. Certain herbicides are registered for post directed application on corn, grain sorghum, and soybeans *(Table 3).* Specialized spray equipment, with nozzles mounted on skids or gauge wheels as shown in *Figure 3,* is often used to deliver herbicides in a band on both sides of the row, onto the base of the crop plants but below the growing point(s). There must be a height differential between the weeds and the crop in order to completely cover the weeds. The spray solution must

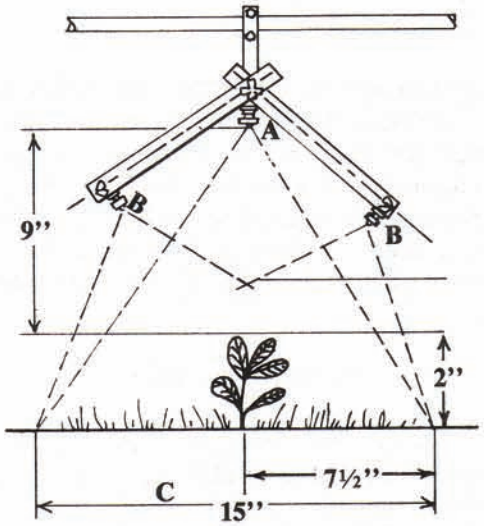

Figure 1. Spray boom setup for row application of herbicide. *A.* Center nozzle spaced about 10 inches above the crop and weed canopy. *B.* Nozzles in adjustable arm brackets. To obtain the desired band width, the nozzle tips may be rotated within the body so that the spray pattern is at an angle to the row. *C.* A suggested band width is 15 inches, about 4 inches wider than the uncultivated band.

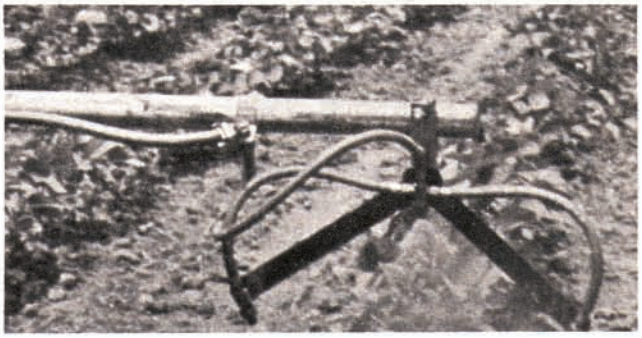

Figure 2. Herbicide being applied over the top of the soybean row with a three-nozzles-per-row unit.

Table 3. Registered herbicides for post directed, basal application on corn, grain sorghum, and soybeans.

Herbicide	*Commercial Product Broadcast Rate Per Acre*	*Remarks*
Corn		
Evik 80W	2-2.5 lbs	Post direct spray solution on the lower 3 inches of corn stalks that are at least 10-15 inches tall. Surfactant may be added to spray solution for improved weed control. Nitrogen solution may be substituted for part or all of the water. Label may restrict grazing or feeding treated forage. Weeds must be 2-5 inches or less for effective control.
Lorox 4L*	1.25-3 pts	
Paraquat or Gramoxone	1 pt	
Grain Sorghum		
Lorox 4L*	1-2 pts	Sorghum should be 12-18 inches minimum height. Use precision application equipment to cover only lower 3 inches of the sorghum stalk. Weeds must be less than 4 inches tall.
Paraquat or Gramoxone	1-2 pts	
Soybeans		
Lorox 4L*	0.5-2 pts	Treat when soybeans are 5-8 inches minimum height, with spray solution directed on lower 3 inches of the soybean plants. Addition of surfactant to the spray solution may be necessary for some products. Weeds may be up to 2-6 inches tall. The label may restrict feeding or grazing treated forage to livestock.
Paraquat or Gramoxone	0.25-0.5 pt	
Dyanap	4-6 qts	
Premerge 3	2-4 qts	

*Additional formulations are available. Use rates that give comparable amounts of active ingredient: 1 pt Lorox 4L = 1.0 lb 50W

not be applied over the top of the crop. Injury may occur on lower leaves that contact the spray solution, but this should not result in long term crop damage if the spray solution is only applied to the lower three inches of the plants. Only generalized remarks are included in *Table 3*. Consult individual product labels for detailed information when making post directed herbicide applications.

Sprayer Calibration

Sprayer calibration is essential whether the herbicide is soil applied in a band at planting or as a postemergence row band treatment. Herbicide rates listed in *Tables 2* and *3* are broadcast rates of the commercial product. To calculate the amount of herbicide required for either granular or spray band applications, use the following formula:

$$\frac{\text{Band width (Inches)}}{\text{Row width (Inches)}} \times \text{Broadcast Rate per Acre} = \text{Band Rate per Acre}$$

Example: If 2.4 qts per acre is the broadcast rate and we are using a 15-inch band on 38-inch crop rows, the band rate is:

$$\frac{15}{38} \times 2.4 \text{ qts} = 0.95 \text{ qts product per acre}$$

There are several good methods used to calibrate a sprayer. NebGuide G82-566, "Calibrating a Sprayer," should answer most questions. In one method, solution is caught from several nozzles along the spray boom while driving over a prescribed distance. The operator can then quickly read the spray volume in gallons per acre directly from a conversion table. Provision is also made in such conversion tables for band spraying.

An important point to remember is that when more than one nozzle is directed to one crop row, the spray solution from *all* nozzles per row must be collected together. The total ounces of solution collected per row is then used in determining from the chart the gallons per acre solution delivered.

Figure 3. Post directed basal spray equipment used to cut chemical costs.

File under: PESTICIDES, GENERAL
B-6, Herbicides

Revised March 1986, 10,000

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture
Leo E. Lucas, Director of Cooperative Extension Service, University of Nebraska, Institute of Agriculture and Natural Resources.

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