

Chemical Weed Control In Cotton for 1982

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Federal and state regulations for herbicides often change, so keep informed on the status of new label clearances. Labels on containers give application details but may not include recently approved changes for other crop or weed species and special new ways to use or apply the herbicides.

Recommendations in this Guide conform to laws and current label regulations and are based on field research. Cost of herbicides was not considered in making these recommendations because prices vary among locations and may change often during the season.

The degree of control in each situation depends upon the weeds infesting the field, rainfall, soil type, temperature, and many other factors. There is no guarantee that you will have completely satisfactory results in all cases because an element of risk goes with use of any herbicide. Thus, we have made no attempt to list herbicides in order of preference.

Application Rates

Herbicides are commonly sold as water soluble (WS), liquid emulsifiable concentrates (EC), wettable powders (WP), or granular (G) formulations. Rarely is a formulation 100 percent active ingredient.

In this Guide, chemical rates are given only on the basis of active ingredient. Rates are for the surface area actually to be treated. On a container label, rates are usually for the amount of formulated product. Products of different manufacturers often contain the same active ingredient but in varying amounts per gallon or bag of formulation. This Guide and the label give the amount of active ingredient or percent by weight of dry or liquid material.

The rate of commercial product to apply per acre is easy to calculate when you know the active ingredient content. **Divide the pounds of active ingredient needed by the pounds per gallon or the percent active ingredient shown on the label of the commercial product.**

When a chemical is applied in a band over the row, the surface area to be treated is less than the acres of crop in the

field. The width of the band determines the amount of herbicide needed for treating the field. The band width divided by the row width times acres of crop equals treated acres or **(Band Width ÷ Row Width) x Acres of Crop = Treated Acres.**

The cost of chemicals is less if band treatment is used, but very timely cultivation is necessary for overall control of weeds in most cases. A band that is half the width of row spacing is usually satisfactory for herbicides applied pre-emergence.

Weed Control Planning

To plan an effective sequence of weed management practices in producing cotton and in eliminating weeds from farmland, you must know what weeds infest each field.

Usually no herbicide will control all of the weeds that germinate and grow in a field. You must plan cultural practices such as crop rotation to corn or sorghum, timely seedbed preparation, and cultivation along with the use of herbicides and flaming.

Fields infested with both grasses and other weeds usually need to be treated with two or more herbicides during the season. You may plan to use a preplanting herbicide, another one at planting time as a pre-emergence treatment, and yet another herbicide after cotton emerges to a good stand. Fields may need layby treatment along with timely cultivation for effective control of weeds until harvest time. Water-shielded flaming is a useful practice for suppressing perennial vines or annual weeds when used in sequence with herbicides.

Fall Application of Herbicides

Trifluralin (Treflan). This herbicide is available in both liquid and granular formulations (4 pounds per gallon EC or 5 percent G). Treat light sand and sandy loams in the fall with 0.5 pounds per acre after October 15, incorporating immediately with a tandem disc, rolling bed conditioner, or PTO-

driven tillage equipment. Set the tools to work the soil 4 inches deep which will put trifluralin into the top 2 inches of soil by thorough mixing. In loam, silt loam and silt soils, increase the rate to .75 pounds per acre. Use 1 pound per acre on clay loam and clayey soil. If organic matter is over 2 percent in sandy soils, use .75 pounds per acre and 1 to 1.25 pounds per acre on soils with 5 to 10 percent organic matter. Fall application may be a way to spread your weed control practices over a longer period and to use labor more efficiently. **Restrictions:** In hilly areas, where soil erosion is a special problem, fall application is unwise. Do not apply on wet fields that overflow in winter or spring.

Preplanting Overtop Treatments

MSMA. When planting is delayed after a seedbed is made, MSMA may be used to control emerged weeds without reworking the seedbed. Cotton may be planted while applying or shortly after MSMA is applied. You should also apply fluometuron or diuron at this time since the MSMA is not residual for control of ungerminated weeds. Use 2 to 3 pounds per acre of MSMA with surfactant (1 quart per 100 gallons) to control *annual weeds* that have germinated after the soil was last tilled but before the weeds are more than 4 inches tall. Use 3 pounds per acre on weeds that are 3 to 4 inches tall.

Control of weeds over 3 inches tall is not usually adequate if they are in thick stand. This treatment will kill emerged shoots of weeds such as *johnsongrass* but is not effective on rhizomes (underground stems). Repeated treatment is needed after new shoot growth of the johnsongrass and other weeds. Control of shoot growth on some *perennial vines* by this MSMA treatment is only of short duration. Reliability of weed control by MSMA decreases in daytime temperatures below 70 degrees F or 21 degrees C.

Paraquat (PARAQUAT). This is a two pound per gallon liquid herbicide formulation. Apply 1/4 to 1/2 pounds per acre with surfactant (1 quart per 100 gallons) after weeds have emerged on a prepared seedbed that will not be worked again before planting cotton. Paraquat will control most annual weeds and kill the foliage of some perennial weeds. *Horseweed* and *smartweed* are not usually controlled well by paraquat. The duration of control of foliar growth on *perennial weeds* may be less than three weeks.

This *stale seedbed* practice is more suited to bedded land where you need to control weeds without reworking the beds which may already have been leveled for the planting operation. This practice may save time and energy.

Concentrated paraquat is **very toxic** to animals and man so it should be handled very carefully according to the label when mixing it with water for spraying.

Preplanting Foliage Treatment

Glyphosate (ROUNDUP). This herbicide is very effective for control of emerged weeds before planting cotton. Soil to be planted to cotton should be bedded in early spring and the beds flattened to final seedbed height. Allow weeds to germinate on the flattened beds until planting time

and then treat the growing vegetation with 1.5 to 2 pounds of glyphosate per acre in 10 to 20 gallons of water per acre.

Cotton may be planted simultaneously with the application of glyphosate or planting may be delayed for several days if weather conditions are not suitable for planting. At the time of planting, a residual herbicide such as fluometuron or diuron should be applied as a pre-emergence treatment to control weeds that will be germinating after the cotton is planted. This practice is especially suitable for heavier soils which are subject to overflow and limited opportunity for tillage during the spring. The amount of tillage necessary for preparation of a good seedbed is minimal. Glyphosate is effective for control of *all emerged annual weed species* known to infest cotton fields in Missouri. Glyphosate will suppress the growth of several species of perennial vines such as *redvine*, *perennial morning-glory*, *honeysuckle*, and *trumpet creeper*. It takes about seven to 10 days for glyphosate to kill annual weeds and stop the growth of perennial weeds under the spring weather conditions in southeast Missouri.

Preplant Incorporated Treatments

Fluchloralin (BASALIN). This chemical is formulated in emulsifiable liquid containing 4 pounds per gallon. It will control many *annual grasses* and *small-seeded, broad-leaved weeds*. Mix fluchloralin into the top 2 inches to soil with PTO-driven tools, tandem disc, or rolling cultivators and bed-working tools (Do-All type). Apply and incorporate within eight hours after spraying from zero to eight weeks before planting. The best performance results from blending the fluchloralin with the soil as it is sprayed. Surface applied fluchloralin will give some control of shallowly germinating weeds, but soil incorporation is absolutely essential for effective and economical control of susceptible weeds.

Apply 1/2 to 3/4 pounds per acre on light sandy soils, 3/4 to 1 pound per acre on medium soils, and use 1 to 1.25 pounds per acre on clayey soils with 1 to 4 percent organic matter content. Soils with 4 to 10 percent organic matter require special rates. Read the label well and note special uses, restrictions, and precautions listed.

Pendimethalin (PROWL). This chemical is primarily useful for the control of *annual grasses* and some *small-seeded, broad-leaved weeds*. This herbicide should be applied and incorporated into the soil in the same operation for best results. It may be applied and mixed into the soil 60 days before or on the day of planting. Apply 0.5 to 0.75 pounds per acre on sandy soils, .75 to 1 pound per acre on medium-textured soils, and 1 to 1.5 pounds per acre on clay loams and heavy clay soils. If the organic matter is below 2 percent, use the lower rate per acre. This herbicide is available as a liquid formulation containing 4 pounds of pendimethalin per gallon.

Incorporate pendimethalin into the soil with a disc set to cut 3 to 4 inches deep, rolling bed conditioner (Do All) set to cut 2 to 3 inches deep, or PTO-driven equipment set to cut 2 to 3 inches deep. A rolling cultivator may be used to incorporate pendimethalin but the soil should be dry and friable (easily crumbled), so it will break into fine particles as

control *cocklebur*. It is usually effective for control of *nutsedge* and *prickly sida*.

Restrictions: Only one application may be made to the same field during one year. If replanting is necessary, a light reworking of the topsoil will not reduce the herbicidal activity of norflurazon. Do not replant crops besides cotton in the same growing season because of norflurazon residue in the soil.

A treated field may be planted to cotton, soybeans or peanuts the following year. Corn, sorghum and other grass crops are very sensitive to norflurazon residue in the soil and should not be planted in the fall or following spring after treatment.

Early Postemergence Treatments

Fluometuron (COTORAN or LANEX) "Overtop."

This treatment is usually not as effective as applying fluometuron at planting as a pre-emergence spray. If emerged weeds are as tall as the cotton, mix 1 to 1.5 pounds of fluometuron in water to spray 20 gallons per acre. If weeds are more than 1 inch tall, add surfactant (1 quart to 100 gallons) to aid fluometuron uptake by the weed foliage. Do not spray overtop if cotton is less than 3 inches high. If weeds are not as tall as the cotton, directing the spray from the side of the row will insure better coverage of the weeds growing under the cotton. One and a half pounds of fluometuron will treat three acres of cotton if applied on a 12-inch band over the row.

DSMA "Overtop." Treatment within 10 days after cotton emerges will usually control *grasses* and *broad-leaved weeds* less than 2 inches tall at treatment. The air temperature should be 70 degrees F or higher for best weed control. The spray must cover the weeds well. Apply 2.3 pounds active DSMA in about 20 gallons per acre of water with a surfactant added to wet foliage well. If weeds are smaller than and growing under the cotton, the spray should be directed from the side of the row and underneath the cotton for best results.

Restrictions: Do not treat twice overtop with DSMA. Direct the second spray under the cotton foliage if it is needed. Do not apply DSMA on cotton going into bloom because the arsenic in the spray usually interferes with fruit development.

DSMA or MSMA "Directed." Use surfactant with these two herbicides when directing sprays under the foliage of cotton no less than 3 inches tall. These arsenical herbicides usually kill *annual grasses* and most *annual broad-leaved weeds* if the weeds are sprayed soon after they emerge and start developing true leaves. Both herbicides are most active at air temperatures above 70 degrees F. Use 1.5 to 2 pounds per acre of MSMA or 2 to 2.8 pounds per acre of DSMA in about 20 gallons per acre of water.

Restrictions: Do not use these arsenicals in cotton that has started to bloom. Do not treat the crop more than twice in one season. **Caution:** Arsenic in plant tissue may interfere with phosphorus nutrition in developing flowers and fruit, resulting in decreased fruit set and a low yield of cotton.

The leaf-drying effect of MSMA is usually more severe

than that from DSMA. Reddening of the cotton stem is a normal effect of arsenical sprays on cotton and will not adversely affect the yield if label precautions are followed. Do not graze or feed treated weeds or crops to livestock.

Diuron (KARMEX) + Surfactant "Directed."

Apply diuron to cotton no less than 6 inches tall at 0.3 to 0.5 pounds per acre. Be sure to mix surfactant (1 quart per 100 gallons) in sprays for control of emerged weeds growing under the cotton plants.

Diuron (KARMEX) + MSMA or DSMA + Surfactant "Directed." Use this mixture of herbicides to control weeds 2 to 4 inches tall under cotton. Use .25 to 0.5 pounds per acre and 1.5 to 2 pounds per acre of MSMA or 2 to 2.8 pounds per acre of DSMA with 1 quart surfactant in 100 gallons of spray. Spray under the cotton foliage to cover the weeds well.

Restrictions: Do not use the arsenicals with the diuron if cotton has started to bloom. Do not graze or use the plants for livestock feed.

Fluometuron (COTORAN or LANEX) + Surfactant "Directed." Mix 1 to 2 pounds per acre of fluometuron in 20 gallons per acre of water adding a quart of surfactant per 100 gallons of spray mixture. A directed spray of this mixture under foliage of cotton no less than 3 inches tall will usually control weeds no more than 2 inches tall. You may apply this treatment up to the time of lay-by, but emerged weeds larger than 2 inches tall may not be controlled. If sprayed on weed-free cultivated soil, fluometuron usually controls susceptible weeds until harvest. If this treatment is applied twice, fluometuron residue in the soil may injure crops planted in the fall after cotton.

Restrictions: Do not apply more than a total of 4 pounds per acre of fluometuron to a cotton crop in one year. Do not apply within 60 days of harvest. Usually soybeans or sorghum may be planted after a fresh seedbed is prepared seven to nine weeks after a single fluometuron treatment banded on the drill row in the spring at the recommended rate for the soil type. See the label for other precautionary statements. Do not feed treated foliage or gin trash to livestock.

Fluometuron (COTORAN or LANEX) + DSMA or MSMA + Surfactant "Directed." Mix 1 to 2 pounds per acre of fluometuron in 20 gallons per acre of water containing either 2 to 3 pounds per acre of DSMA or 1.5 to 2 pounds per acre of MSMA and 1 quart surfactant per 100 gallons of mix. Spray this mixture under the foliage of cotton no less than 3 inches tall. **Caution:** If fluometuron was used as a pre-emergence spray at planting time, apply arsenical herbicides alone, if needed, at this early stage of cotton growth. There will usually be enough residue of fluometuron in the soil four to six weeks after treatment to control newly germinated, susceptible weeds. Follow precautions for usage of arsenical sprays in cotton.

A water dispersible slurry formulation of fluometuron with MSMA and surfactant added is commercially available. It contains 1.6 pounds per gallon active fluometuron with 3.3 pounds of MSMA and a suitable surfactant. Apply 1/2 gallon per acre of this mixture as a directed spray to control seedling weeds in cotton after it is 3 inches tall.

Prometryn (CAPAROL) + DSMA or MSMA + Surfactant "Directed." Prometryn combined with an arsenical herbicide and surfactant is effective for controlling *annual grasses* and other *weeds* in cotton no less than 3 inches tall. The weeds must not be more than 2 to 3 inches tall. Apply 0.5 to .75 pound per acre of prometryn in a mixture with 2 to 3 pounds per acre of DSMA or 1.5 to 2 pounds per acre MSMA in about 20 gallons per acre of water with 1 quart of surfactant per 100 gallons of mix. Best control of weeds results when the air temperature is above 70 degrees F. **Restriction:** Do not apply this arsenical spray mixture to cotton that has started to bloom.

A liquid slurry formulation (CAPAROL + MSMA + Surfactant) is commercially available. It contains one pound of prometryn and 4 pounds of MSMA per gallon. Apply 1/2 gallon per acre of this mixture no more than twice during a growing season.

Restriction: Do not feed the weed or crop foliage or gin trash to livestock.

Methazole (PROBE) + MSMA + Surfactant "Directed." Apply a tank mixture of 0.5 to 1.5 pounds per acre of methazole with 1.5 to 2 pounds per acre MSMA in about 20 gallons per acre of water with an added surfactant (1 quart per 100 gallons). Spray cotton that is 3 to 6 inches tall with 0.5 to 1 pound per acre of methazole plus MSMA. Increase the rate to 1.5 pounds per acre of methazole after cotton is 6 inches or more in height. Do not use mixtures of methazole and MSMA as pre-emergence or lay-by sprays. Always direct the spray underneath the leaf tissue to prevent cotton injury and discoloration. **Restriction:** Do not use MSMA on cotton after it starts to bloom.

Methazole will usually control *prickly sida*, *velvetleaf*, and *spurred anoda* if these weeds are less than 3 to 4 inches tall. Thorough coverage of the weed foliage is critical for this mixture to control them adequately. Methazole will usually be decomposed to a non-phytotoxic level in soils within two weeks after application. Thus, it offers no residual control of ungerminated weeds after using it as a directed postemergence spray.

Late Postemergence Treatments

Dinoseb (Numerous Trade Names) "Directed." Apply 1.5 to 2.25 pounds active ingredient per acre in 20 to 30 gallons of water as a direct spray. Treat when the cotton is 6 inches or more in height. **Restrictions:** Small cotton plants may be killed by this herbicide. Do not apply on a wet soil surface. Avoid getting the spray on the cotton foliage by treating only the lower half of the stem. Cotton will recover from injury of basal leaves. This treatment may be repeated twice if needed until the bolls start opening.

Cyanazine (BLADDEX) + Surfactant "Directed." Apply cyanazine at rates of 0.6 to 1 pound per acre of active ingredient. Cotton should be at least 6 inches tall and weeds under the cotton plant should be 2 inches or less in height. Mix one pint of surfactant in 100 gallons of spray. Cyanazine is more effective on *broad-leaved weeds* than *grass weeds*. Tank mix with 2 pounds of MSMA for better grass control.

Apply before first bloom. Cyanazine will injure cotton if not applied properly. Direct spray to base of cotton plant.

Diuron (KARMEX). This herbicide is recommended as a lay-by spray for cotton that is heavily infested with *annual weeds*. Usually, severe late-season weed infestations occur only in years with above normal rainfall, in irrigated fields, or in skiprowed cotton. Use diuron during the last cultivation when you lay cotton by. On the surface of clean, cultivated soil, diuron applied at 0.5 to 1 pound per acre on sandy soils will control weeds until harvest. Use 1 to 1.5 pounds per acre on loam and clay loam soils during or at time of last cultivation. Treat the soil before weeds have germinated if at all possible. Otherwise add surfactant to the spray (1 quart per 100 gallons). Cover the middle of each row completely with the spray. Avoid treating the cotton leaves.

Residues of diuron in the soil may injure fall-seeded crops. It is safe to follow diuron treatment at lay-by with all of the spring-seeded crops.

Fluometuron (COTORAN). This herbicide may be used in cotton at time of lay-by. Use 1 to 2 pounds per acre depending upon the expected weed problem and the soil type. Apply 1 pound per acre on sandy soils if fluometuron has not been applied earlier in the season. A rate of 0.5 to .75 pound per acre following earlier treatment will usually be sufficient. On loams to clay loam-textured soils, rates between 1 and 2 pounds per acre in addition to earlier treatments may be needed to maintain control of weeds until harvest. Add surfactant to the spray mixture if small weeds are in the middle of rows at time of lay-by.

Wheat and other cover crops may be planted in November after lay-by treatment with fluometuron in late July. With use of the maximum labeled rates of fluometuron during the growing season, a residue level could be such that fall-seeded crops would be injured by fluometuron. Low rainfall in autumn may slow the breakdown of soil residues of diuron, fluometuron, and linuron.

Linuron (LOROX). This chemical may be applied as a lay-by treatment at the last cultivation in the same manner as diuron and fluometuron. Apply 0.5 to .75 pound per acre after cotton is 15 inches tall. If small weeds (1 to 2 inches tall) are present at the time of application, add surfactant to the spray mixture. This treatment may be repeated after seven days if needed. If cotton is 20 inches tall, 1 to 1.5 pounds per acre may be applied as a single treatment at lay-by. Surfactant should be added to the spray mixture if small weeds are present.

Non-Selective Spot Treatments

These non-selective spot treatments are recommended for the control of *isolated weed plants* growing in the cotton that are not controlled by the usual selective herbicide treatment.

Dalapon (DOWPON). *Johnsongrass* plants scattered through the field may be treated individually with dalapon. Wet the foliage well with a solution of 15 pounds of dalapon per 100 gallons of water (20 pounds per acre of DOWPON). Repeat the treatment on plants that survive the first spray.

it is thrown into the air by the tines. Pendimethalin should first be blended with the soil prior to listing or bedding operations to avoid layering of the herbicide in a shallow depth zone of soil. Mechanical incorporation improves performance.

Profluralin (TOLBAN). Content in the emulsifiable liquid concentrate is 4 pounds per gallon. It is useful in a weed management plan for control of *annual grasses* and *small-seeded, broad-leaved weeds*. *Large-seeded weeds such as cocklebur, morning-glory, jimsonweed and velvetleaf* are not usually suppressed by this herbicide. Best control results if profluralin is incorporated into the soil during application. However, incorporation delayed up to four hours is a labeled practice. Use a tandem disc, rolling bed tool, or PTO-driven equipment to mix profluralin into the top 2 inches of soil. Use 1/2 to 3/4 pounds per acre on sandy soils, 3/4 to 1 pound per acre on medium-textured soils, and 1 pound per acre on clayey soils. Avoid wet soil applications.

Profluralin may be tank mixed with fluometuron and incorporated as if used alone before planting cotton. Mix the same doses of each herbicide that are used separately for a given soil. Convenience and economy of the tank mixture usually will compensate for a slight reduction in total weed control. Plant on the same day or within one week after incorporating the tank mixture into the seedbed.

Trifluralin (TREFLAN). This herbicide is available in emulsifiable liquid and granular formulations. The liquid contains 4 pounds per acre and the granules are 5 percent trifluralin. This herbicide reliably controls *weed grasses* if there is enough moisture in the soil to promote germination after it is applied.

Trifluralin rates are 0.5 pounds per acre on sand and sandy loam soils, and 1 pound per acre on clay loams and clayey soil textures. The rate should be 25 percent greater for each soil texture if the organic matter content is between 2 to 3 percent. Use 50 percent more trifluralin than the above rates for soils containing from 4 to 6 percent organic matter in each textural class. It must be incorporated properly into the surface 2 inches of soil. Blend trifluralin into the soil after application before the field is bedded to avoid layering of the herbicide in a shallow depth zone. Use a tandem disc working the soil at an angle to the direction of the first trip when disking the second time. Set the disc to work the soil 3 to 4 inches deep at each pass. Other tools such as the rolling bed conditioner, rolling cultivator, or PTO-driven equipment will incorporate this herbicide properly if they are set to work 3 to 4 inches deep and if the soil is not overly wet. Run the rolling bed conditioner (Do All) over 5 miles per hour. Be sure the soil is dry enough to divide finely as it is lifted by the blades. Except for damp clayey soils, two passes over the field will adequately incorporate trifluralin.

Use a disc to incorporate trifluralin into heavy clay soils. Make sure the topsoil is dry enough to break apart and blend well with two passes of the disc. If applied on wet soils or on those which have water standing over them more than seven to 10 days, variable weed control may result. Eight hours delay in blending into the soil is a labeled practice, but incorporating while applying trifluralin will usually insure

best performance. At wind speeds over 10 mph. or when the soil surface is above 110 degrees F, loss of trifluralin by vaporization or light destruction may occur if incorporation is delayed.

Trifluralin may be tank mixed with fluometuron and incorporated before planting cotton. In the mix, use the same amounts of each herbicide that you would use if you were using them alone. Plant on the same day or within one week after mixing the combination into the seedbed.

As is true for all of the herbicides similar to trifluralin in chemistry and weed control action, other herbicides or cultural practices will be needed in addition to trifluralin for controlling *cocklebur* and other *large-seeded weeds*, which germinate below the soil level containing the trifluralin or other incorporated herbicides.

Pre-emergence Treatments

Diuron (KARMEX and Others). An 80 percent wettable powder and a 2.8 pounds per gallon formulation of diuron is available. Diuron usually controls *annual grasses* and *broad-leaved weeds* for six to eight weeks if there is enough rainfall (1/4 inch) within three days after treatment to move it into the surface inch of soil. Diuron is not recommended for use on light sands or heavy clay soils. Use 1 to 1.25 pounds per acre on sandy loams, up to 1.6 pounds per acre on loams, and 1.8 pounds per acre on clay loams. *Perennial weeds* are not controlled at these rates. Combine the planting and spraying in one operation if possible, or apply diuron just as soon as possible after planting.

Restrictions: Do not feed gin trash or accumulate trash near streams or above garden plots on sloping ground.

Fluometuron (COTORAN or LANEX). This herbicide is formulated as 80 percent wettable powder. It will control many *annual grasses* and *broad-leaved weeds*. Unless it is leached into soil surface by rainfall (1/4 inch) within four days after planting, control of *prickly sida, velvetleaf, cocklebur, and annual morning-glory* may not result. Fields may need additional overtop treatment of fluometuron or other herbicides in sequence to control these weeds if dry weather occurs after planting.

Fluometuron may be applied on the soil surface, lightly incorporated before planting or sprayed overtop of seedling cotton. Apply as a pre-emergence spray from 1 to 2 pounds active ingredient per acre using 1 pound for sandy soils, 1.5 pounds on sandy loams to loams, and two pounds on clay loams. (See the section on postemergence treatments.)

Repeated treatment with sprays which contain fluometuron may lead to an accumulation of residues in the soil that could inhibit growth of crops planted in or after cotton.

Restrictions: The field should not be treated with more than 3 to 4 pounds total fluometuron in one growing season, depending on soil texture and as specified on the label. Do not feed gin trash to livestock or accumulate trash near streams or garden plots.

Norflurazon (ZORIAL). Apply 1 to 2 pounds per acre as a pre-emergence surface treatment at planting to control *annual grasses* and some *broad-leaved weeds*. It will not

Glossary of Herbicide Names

Trade Name	Common Name	Chemical Name
<i>Bladex</i>	cyanazine	2- [4-chloro-6-(ethylamino)-s-triazin-2-yl] amino] -2-methylpropionitrile
<i>Basalin</i>	fluchoralin	[N-(2-chloroethyl)-2, 6-dinitro-N-propyl-4-(trifluoromethyl) aniline]
<i>Caparol</i>	prometryn	2,4-bis(isopropylamine)-6-(methylthio)-s-triazine
<i>Cotoran</i>	fluometuron	1,1-dimethyl-3-(a,a,a-trifluoro-m-tolyl) urea
<i>Dinitros</i>	dinoseb	(2, sec-butyl-4,6-dinitrophenol), amine
<i>Dowpon</i>	dalapon	2,2-dichloropropionic acid
<i>Karmex</i>	diuron	3-(3,4-dichlorophenyl)-1,1-dimethylurea
<i>Paraquat</i>	paraquat	1,1'-dimethyl-4,4'-bipyridinium salt
<i>Probe</i>	methazole	2-(3,4-dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione
<i>Prowl</i>	pendimethalin	N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitro = benzenamine
<i>Roundup</i>	glyphosate	N-(phosphonomethyl) glycine
<i>Severol</i>	DSMA	disodium methane = arsonate
<i>Severol</i>	MSMA	monosodium methane = arsonate
<i>Tolban</i>	profluralin	N-(cyclopropylmethyl)-a,a,a-trifluoro-2,6-dinitro-N-propyl-p-toluidine
<i>Treflan</i>	trifluralin	a,a,a-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine
<i>Zorial</i>	norflurazon	4-chloro-5-(methylamino)-2-(a,a,a-trifluoro-m-tolyl)-3-(2H)-pyridazinone

Consult UMC Guides 4858 and 4860 for more details on controlling perennial johnsongrass and other perennial weeds.

Flame Cultivation Treatments

Flame cultivation is an effective and economical method of controlling weeds in cotton. It will kill the foliage of weeds which escape an earlier herbicide treatment. **Perennial weeds** and **vines** that are not controlled by herbicides and regular cultivation are damaged by flame. Flame cultivation is most effective after herbicides have already been applied.

Flame cultivator burners may be set at a right angle to the row for *cross flaming* cotton. Flaming may begin when the cotton stalk is 5/32 inch in diameter at the ground line and the plants average 6 to 8 inches tall. Repeat the flaming as

necessary to control weeds. You will see the best results if weeds are not more than 1 to 3 inches high at the time of flaming. Careful attention should be given to burner adjustments. A level seedbed helps to keep the flame off the cotton.

Water-shielded flaming may be used on small cotton (4-6 inches tall). It does a good job of controlling weeds in the drill area underneath the cotton.

The flame is *shielded* by setting a water spray nozzle immediately above and parallel to the burner. A 1/4-inch pipe is welded to the burner bracket to mount the nozzle. The water shield keeps the leaf temperature of cotton lower and permits flaming cotton that has grown only to an average height of 5 inches.

Water-shielded flaming slows the speed of travel to 3 to 4 mph. with regular side burners. Use a nozzle that sprays about 5 gallons of water per acre at 60 to 70 pounds per square inch for best results.

The guide is, in part, a report on Research Project 3640, Herbicide Cycles, Agronomy Department, Missouri Agricultural Experiment Station.