



# WEED CONTROL PRIMER

By Dr. Craig Harper

The biggest problem people have when growing food plots is weed control.

Sometimes, this is because of a seed-bank that is full of problematic weeds that are difficult to control, but most of the time it is because people don't know what to spray or how to apply it correctly. Few people understand herbicide applications or can identify weeds, and the few who do often spray at the wrong time. In this article, I will cover the basic information necessary to get your weed problem under control. Some of it is a little complex, but *if I can do it* – and if the clients I work with can learn to do it – then you can too!

The ability to identify weeds is required if you hope to be successful. You can tell the difference between cowpeas and soybeans, can't you? Then you can learn to identify curly dock, horseweed, horsenettle, henbit, chickweed, deadnettle, and several other common weeds. You don't have to be a botanist. Get a weed field guide that has good color pictures. I like *Weeds of the South* and *Weeds of the*

*Northeast* (both available from QDMA by calling 800-209-3337 or at QDMA.com). Unless you know which weeds you have, it is difficult, and sometimes impossible, to determine whether a cultural, mechanical, or chemical method is needed. If an herbicide application is needed, you need to know which weeds are present to identify the correct herbicide. Different herbicides control different species of weeds. It is also important to understand the seasonal life cycles of weeds. Just as you have warm- and cool-season food plot plantings, there are also warm- and cool-season weeds. Realizing this is one of the most important aspects in successful weed management.

## Cultural, Mechanical, or Chemical?

Which of these three approaches is needed to control weeds in food plots? All three! However, one will be more important at certain times and in certain circumstances than the others.

**Cultural approaches** involve common-sense practices, such as planting an annual cool-season plot in a field that has an overwhelming warm-season weed problem, or planting grasses (such as



The ability to identify weeds, such as this curly dock in a chicory plot, is necessary in order to know which herbicide to use.

wheat or oats) only in a plot that has a tremendous broadleaf weed problem, which will enable you to use a broadleaf-selective herbicide later.

**Mechanical weed control** usually involves mowing, disking, or cultivation. Mowing is most commonly used with perennial forages, but mowing does not

## HERBICIDES COMMONLY USED WITH FOOD PLOTS

The chart presented on the right features several examples of some popular herbicides, listed by trade name, used in warm- and cool-season food plots. Of course, there are other brands, and this list is not meant to imply approval of these products to the exclusion of others, which may be of similar composition or equal value.

When using these or other herbicides, refer to herbicide labels for recommended application rates. As noted in the accompanying article, always read, understand, and follow herbicide label directions before use. Consult your local Extension agent for professional advice and the latest recommendations on herbicide use.

get rid of weeds, especially perennial weeds. Disking is most commonly used when preparing a seedbed. However, this does not get rid of perennial weeds either. If you don't spray them at the correct time, they will be back. Cultivation is a great tool to use if you use a planter to plant row crops. Cultivation is especially successful when combined with a preemergence herbicide. That leaves us with **chemical options**, which are the focus of this article.

### Types of Herbicides

There are four primary types of herbicides used in food plot applications. **Broad-**

## PREEMERGENCE / PREPLANT INCORPORATED

Broad-spectrum selective	Labeled WARM-SEASON crops	Labeled COOL-SEASON crops
Pursuit (preemergence) <sup>1</sup>	soybeans, cowpeas	winter peas
Prowl	corn, soybeans, cowpeas, sunflowers	winter peas
Treflan	soybeans, cowpeas, sunflowers	winter peas, brassicas, chicory, wheat
Atrazine <sup>2</sup>	corn, grain sorghum	
Dual II Magnum <sup>1</sup>	corn, soybeans, cowpeas	

## POSTEMERGENCE

Broad-spectrum	Labeled WARM-SEASON crops	Labeled COOL-SEASON crops
Roundup	corn, soybeans <sup>3</sup>	
<b>Broad-spectrum selective</b>		
Pursuit	soybeans, cowpeas	alfalfa, clovers, winter peas
Accent Q	corn	
Basagran	corn, grain sorghum, soybeans, cowpeas	
Permit	corn, grain sorghum	
<b>Grass-selective</b>		
Clethodim	soybeans, cowpeas, sunflowers	alfalfa, brassicas, chicory, clovers
Poast 1.5 L	soybeans, cowpeas	alfalfa, chicory, clovers, winter peas
<b>Forb-selective</b>		
2,4-D amine	corn, grain sorghum	
Oracle	corn, grain sorghum	
Clarity	corn, grain sorghum	wheat, oats
2,4-D		wheat, oats
Butyrac 200		alfalfa, clovers
Banvel		wheat, oats
Harmony Extra		wheat, oats

1 - If rainfall is timely, Pursuit and Dual II Magnum work very well preemergence (without incorporation) for most weed species.

2 - Atrazine is a restricted-use pesticide, meaning an applicator's license is required before use.

3 - Roundup Ready<sup>®</sup> varieties only.

**spectrum** herbicides kill all plants. The most common of these is glyphosate, which is found in a number of commonly used herbicides, such as Roundup. **Broad-spectrum selective** herbicides kill specific species of plants in various plant groups, including grasses, forbs (broadleaf herbaceous plants), sedges, and rushes. **Grass-selective** herbicides only kill grasses. **Forb-selective** herbicides kill forbs, and some may kill various sedges and rushes, but not grasses.

### Herbicide Applications

There are three primary herbicide applications: postemergence, preemergence, and preplant incorporated. Postemergence applications are sprayed on the leaves of growing plants. Preemergence applications are sprayed on the ground and kill plants as soon as they germinate. Preplant incorporated applications are sprayed on the ground, then disked-in. Thus, preemergence and preplant incorporated herbicides are soil active. Most postemergence herbicides are not soil active. Read the herbicide label to know for sure.

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Mowing does not get rid of weeds, especially perennial weeds. Using the correct herbicide applications is much more effective in controlling problem weeds than mowing.

### Various Herbicide Considerations

Different herbicides work in different ways. That is, they kill plants by affecting them differently. This is called *mode of action*. Sometimes it is necessary to use an herbicide with a different mode of action, especially where there are herbicide-resistant plants. The most common example is where glyphosate-resistant pigweed and horseweed have developed over time. Using a broad-spectrum selective or for-selective herbicide with a different mode of action is required to control these problematic weeds.

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There are crop-rotation restrictions with many preemergence and preplant incorporated herbicides. Because some of these herbicides may remain active in the soil for a few to many months, it is critical to plan ahead and keep notes on what you have sprayed. For example, imazethapyr, the active ingredient in Pursuit, can remain active for many months after planting. According to the Pursuit label, you should not plant alfalfa, clovers, rye, or wheat for four months after applying Pursuit. You should not plant corn for at least eight months after spraying Pursuit



Preemergence herbicides are applied to the ground before weeds germinate.

(unless you plant Clearfield varieties of corn), and you should not plant oats, grain sorghum, or sunflowers for 18 months after spraying Pursuit. Seedlings of all these crops are susceptible to imazethapyr.

Postemergence herbicides have a “rain-fast” time. That means if it rains within one to four hours after application, effectiveness will be reduced. To know the rain-fast time of the postemergence herbicide you are spraying, you must read the label. Several preemergence and preplant incorporated herbicides have a “required moisture” time. That means, in order for full effectiveness of the herbicide to be realized, it needs to rain or you must irrigate within two to three days after application (depending on which herbicide you use). Do you see how complicated farming can be!?!?

Most postemergence herbicides need a surfactant in order to be effective. A surfactant is a “surface-active agent” that helps the herbicide stick, spread, wet, penetrate, and disperse on the surface of plants. Thus, surfactants are not used with preemergence or preplant incorporated herbicides. Non-ionic surfactants and various crop-oil concentrates that contain non-ionic sur-

## CALIBRATE YOUR SPRAYER!

So, you have learned to identify your major weed problems. You have done your homework and identified the herbicide necessary to control the weeds in your food plot(s). You have planned ahead, and you are spraying at the correct time. None of this matters if you haven't calibrated your sprayer! Herbicide applications must be precise. Many herbicides are applied in ounces per acre. It is absolutely critical to calibrate your sprayer and know exactly how many gallons of solution you are applying per acre. Once you know how many gallons per acre you are applying, then you simply add the amount of herbicide recommended to the spray mixture. Calibrating your sprayer is very easy and can be done with a few methods. Refer to QDMA's book *Quality Food Plots* for proper steps to calibrate your sprayer. Don't fool yourself; this is not something that can be guessed. Calibrate your sprayer!

factants are most commonly used. Some postemergence herbicides, especially most formulations of glyphosate, already contain a surfactant. Thus, you don't have to add surfactant to the herbicide-water mixture. To know if a surfactant should be added to the postemergence herbicide you are using, and if so, what kind of surfactant should be added, read the herbicide label.

Always follow herbicide label instructions. Not using herbicides in accordance with the label is a violation of federal law, not to mention the risk of damage to the crop, wasting herbicide, or other potential negatives.

### Initial Steps

A postemergence application of glyphosate is commonly used to kill existing vegetation prior to conventional seedbed preparation and prior to no-till planting. One to two quarts (depending on weed species present and age of weeds) of a glyphosate herbicide per acre will kill a majority of weed species. If weeds are not too tall, you can plant via no-till planter immediately after spraying. However, it is recommended to wait a week after spraying before planting. That allows you to see any missed areas and spray them before planting. If weeds are too tall or thick, the dead thatch layer may prohibit seedling establishment and growth. If you are planting via conventional methods, it is best to allow the dead material to wilt down and

begin decomposing (or you can burn it off). In many cases, that means it is best if you spray about a month before planting. If weeds are large, you may not realize a good kill and you should spray again. All of this begins to highlight a common theme when it comes to managing with herbicides: **You must plan ahead!**

Planning ahead is especially important when you intend to plant where there is existing sod cover (tall fescue, orchardgrass, bermudagrass, bahiagrass). Make no mistake; these grasses should be killed

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**ALMOST EVERYONE DECIDES  
WHAT THEY WANT TO PLANT,  
THEN THEY TRY TO FIND AN  
HERBICIDE THAT WILL KILL THE  
WEEDS IN THEIR PLOT. THIS  
OFTEN DOESN'T WORK. TACKLE  
YOUR WEED PROBLEM FIRST!**



Perennial grasses, such as this tall fescue, should be killed before seedbed preparation. Perennial grasses should be burned, mowed, or grazed prior to spraying so you are spraying green, growing grass.

at least a month, preferably more, prior to planting. Re-application is often needed. This will be evident within two weeks after the initial application. Glyphosate herbicides will kill all of these grasses, but approximately 5 quarts per acre are needed to kill bermudagrass and bahiagrass. There are other herbicides that are more effective

in killing bermudagrass and bahiagrass, but they are soil active and your options for planting are restricted soon after spraying. Regardless of the herbicide you use, your spray efforts will be most successful if you spray perennial cool-season grasses in the fall and perennial warm-season grasses in the summer.

### Preemergence and Preplant Incorporated Applications

After you have controlled existing weeds and are ready to plant, you should consider using a soil-active herbicide if there is one labeled for the crop(s) you are planting. If you are drilling seed via no-till, a preemergence herbicide can be applied just before or just after you drill the seed. If you are planting via conventional methods (tillage), you can apply a preplant incorporated herbicide just before you disk-in the seed (and incorporate the herbicide into the top couple inches of soil with the seed you are planting), or you can apply a preemergence herbicide after disking-in the seed.

### Postemergence Applications

After you have planted and weeds begin to appear with the crop(s) you planted, you can apply a postemergence herbicide (labeled for the crop(s) you planted) to control the weeds. **Timing is critical.** Postemergence applications are best made when weeds are young and short. For most selective postemergence herbicides, effectiveness is greatly reduced once the weeds reach 4 to 5 inches in height. I cannot

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## TRY THESE WARM-SEASON FOOD PLOT MIXES

stress how important this is! With broad-spectrum postemergence applications (Roundup Ready® crops), timing is less important; however, even glyphosate applications are more successful when weeds are sprayed when young.

### Seasonal Herbicide Strategies

If you have a plot(s) with an especially bad weed problem, such as curly dock or horsenettle, identify the weeds. Then, identify one or more herbicides that work well on the problem weeds. Next, identify a crop that is labeled for your herbicide of choice. Note that this is just the *opposite* of what everyone does! Almost everyone decides what they want to plant, then they try to find an herbicide that will kill the weeds in their plot. This often doesn't work. Take a different approach. Tackle your weed problem first, then you can plant something different if desired once you get your problem weeds under control.

One of the best strategies in accomplishing this is to determine if your problem weeds are warm- or cool-season weeds. Once you know this, then plant the opposite. For example, if your problem weeds are warm-season, plant an annual cool-season plot. Then, you can use whatever herbicide is needed to kill the weeds once the annual cool-season plot dies and the warm-season weeds are growing.

Annual plots are the key to tackling tough-to-control weed problems. They allow you to use a variety of herbicides once the plot dies. Your options for perennial plots are much more limited.

### Warm-Season Food Plot Strategies

There are many preplant incorporated and preemergence herbicide options for the majority of warm-season crops you might plant. I strongly recommend them. They are a key to clean, weed-free warm-season plots. There are also several postemergence options. Of course, the most popular are Roundup Ready options for corn and soybeans. However, if you intend to plant non-Roundup Ready crops, you should think carefully about your problem weeds. Be aware of warm-season grass weeds. Some of the most common include johnsongrass, crabgrass, goosegrass, and broadleaf signalgrass. If you plant a mixture that contains a grass, such as grain sorghum, your postemergence grass-control options are severely limited. Think about what weeds you have before you

**Iron-clay cowpeas .....50 lbs./acre\***  
**Lablab .....10 lbs./acre**  
**Peredovik sunflowers .....5 lbs./acre**

With this mixture, we plant conventionally and use 3 pints Prowl (per acre) preplant incorporated, then apply 12 ounces of Clethodim (per acre) postemergence with a non-ionic surfactant to control grass weeds before they reach 4 to 5 inches in height.

**Iron-clay cowpeas .....60 lbs./acre**  
**Corn .....8 lbs./acre**

If we are not planting Roundup Ready corn and want to plant something with the corn, we generally use cowpeas because they vine up through the corn better than most soybeans. We use 2 pints of Dual II Magnum preplant incorporated. You can either disk-in the corn and cowpeas with the Dual II, or you can plant them separately with a planter or drill after you've incorporated the Dual II. If you use a planter or drill, adjust seeding rate as necessary. We normally broadcast this mixture because we are already disking-in the herbicide.



\*All rates given are "pure live seed" (PLS).



decide what to plant.

There are many warm-season plantings that can be used to grow high-quality food plots for white-tailed deer. My personal favorites are soybeans and corn, planted separately. I would argue the single best planting for white-tailed deer is soybeans. No other single planting provides more management flexibility or better nutrition over a wider window of time than soybeans. I also highlighted a couple of warm-season mixtures we commonly use and the herbicide applications we use with them (see the sidebar above). There is

nothing magical about these mixtures, but I can assure you they work well.

### Cool-season Food Plot Strategies

There are very few preplant incorporated or preemergence herbicide options with cool-season plots. For most cool-season plantings, you will be using postemergence applications. One of the biggest considerations with weed control in cool-season plots is choosing your site carefully. If there are tough-to-control weeds on the site, you should either plant

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a warm-season crop for which there is an herbicide that will control the problem weed(s), or plant an annual cool-season plot for which there is an herbicide to control the problem weed(s). For example, one easy strategy if you have exceptionally problematic broadleaf weeds is to plant wheat and/or oats. Then, you can use any of several strong forb-selective herbicides, such as Harmony Extra or Clarity, to control the weeds. After you have control of the problem weed(s), which may take one to three seasons, you can plant something else if desired. Don't let your ego get in

the way here – there is nothing wrong with planting wheat and oats! When soils are amended properly and the plot is top-dressed as needed with nitrogen, wheat and oats are very nutritious and attractive for whitetails. This is a very easy and attractive solution for problematic broadleaf weeds. Control your problem weeds, then you can plant the sexy perennial clovers and chicory if you want. Better yet, for most properties, I recommend both annual and perennial plots. Both, as well as warm-season plots, have a place in most food plot management plans.

Perennial cool-season plots are the toughest of all to manage when it comes to problematic weeds. In fact, it has driven a good friend of mine to essentially hate perennial plots. “Mow, mow, mow. Spray, spray, spray. That’s all I do!” he used to say. Such is life when you are managing perennial plots. If you are managing perennial plots correctly, for full yield and benefit, you can count on spraying them at least twice (and usually more) per year and mowing at least twice per year.

There are some good herbicides that can be used to manage perennial plots. However, you must plan ahead and spray at the correct time. Usually, that means spraying warm-season weeds in April/May (according to your location) and spraying cool-season weeds in September to November and perhaps again from February to April, with exact timing depending on your location.

There are a myriad of combinations that can be used with cool-season plots. Many contain grasses, leguminous forbs (such as clovers and alfalfa), and non-leguminous forbs (such as chicory and brassicas). This can be challenging when coming up with herbicide control options. On the facing page are some that we use regularly with success. Again, there is nothing magical about the mixtures, but after years of testing, I guarantee these work very well. With regard to variety, choose the one that is best suited to your location.

Hopefully, this article has given you some information and ideas you can use to control weeds in your food plots. Learn your weeds. Calibrate your sprayer. Plan ahead and plant according to your weed pressure. If you do this, you will be well on your way to more productive food plots and far less frustration. 

**About the Author:** *Craig Harper is a Professor of Wildlife Management at the University of Tennessee. Craig is a regular contributor to Quality Whitetails and a Life Member of the QDMA. Dr. Harper and his graduate students have been conducting research on herbicide applications in wildlife food plots for 14 years. Results of this work are published in “A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense.” The book is currently sold out, but the second edition should be available this summer, prior to the QDMA National Convention, at QDMA.com.*

## TRY THESE COOL-SEASON FOOD PLOT MIXES

**Wheat or oats ..... 40 lbs./acre**  
**Crimson clover ..... 15 lbs./acre**  
**Arrowleaf clover ..... 5 lbs./acre**

This is the best annual mixture I have ever used. It grows nearly everywhere – sandy soils, clay soils, down South, up North as far as Pennsylvania and southern Michigan – and deer and turkeys absolutely love it. We spray 2 to 3 quarts of Butyrac 200 (per acre) postemergence with a non-ionic surfactant before cool-season weeds reach 3 inches in height. Once the arrowleaf dies in summer, we spray incoming warm-season weeds with a glyphosate herbicide. When planted in early to mid-September, we have lush, highly digestible forage from October through July with this mixture. By July, the deer are concentrating on our soybean plots. It's that easy! No mowing whatsoever, and relatively little spraying. We have tested and used several variations of this mixture. Results of these tests will be provided in a future issue of *Quality Whitetails*.



**Wheat ..... 40 lbs./acre**  
**Austrian winter peas .. 20 lbs./acre**  
**Forage brassica ..... 4 lbs./acre**

If you want to plant a mixture up North, as opposed to a single species plot, this one works well. We preplant incorporate 2 pints of Treflan HFP or Trifluralin 4EC per acre, then plant our seed.

**Wheat or oats ..... 40 lbs./acre**  
**Red clover ..... 7 lbs./acre**  
**Berseem clover ..... 5 lbs./acre**  
**Ladino clover ..... 4 lbs./acre**  
**Chicory ..... 2 lbs./acre**  
**Forage brassica ..... 1 lb./acre**

This is a highly nutritious and attractive perennial mixture. If you're up North, don't include the berseem clover, and you might want to use wheat instead of oats unless you use a good winter-hardy variety of oats. We usually include annuals with all our perennial forages because they germinate quicker and provide good forage in the fall and winter after planting. When the annuals die, you are left with a perennial plot of ladino and red clovers and chicory. And don't let anyone tell you that you shouldn't use red clover. It's one of the most attractive clovers for deer, is more drought tolerant than ladino white clovers, and, nutritionally, compares very well to ladino white clovers. There is no preemergence herbicide to use with most perennial mixtures. We spray 4 ounces of Pursuit and 12 ounces of Clethodim (tank mixed, per acre) postemergence with a non-ionic surfactant once the crimson produces seed and the wheat or oats bolt. We generally mow this mixture in August and spray again in October to control incoming cool-season weeds.

**Wheat or oats ..... 40 lbs./acre**  
**Alfalfa ..... 10 lbs./acre**  
**Red clover ..... 5 lbs./acre**  
**Chicory ..... 3 lbs./acre**

This is another exceptional perennial mixture that even performs well on relatively dry sites. We spray/manage this mixture as the one above.

