



SPECIAL ISSUE:

The WheatTech Watchglass

Wheat Management Tips from Chris Bowley - WheatTech Inc.

Spring Weed and Insect Control Guidelines

Now that Mid March has arrived our attention is focused on scouting for weeds and insects and watching the crop progress toward Feekes growth stage 6 (GS 6) and our 2nd nitrogen application. Recent warm conditions have encouraged early weed and wheat development. As a result our herbicide and nitrogen applications will be ahead of schedule this year compared to last year. It looks like we are going to have another year where timing of herbicide and N applications will overlap. Prior to making any herbicide, insecticide or 2nd N applications, we need to evaluate the condition of the crop.

CROP CONDITION

In most areas, the first nitrogen application is finished. If the first N application has not been made, now is the time to switch to a single shot application at GS 6 especially in KY and southern regions of IL/IN/OH. Second applications will probably wait for a further 10-14 days in southern counties and 20-30 days in extreme northern counties. Herbicide applications will start as soon as the giant ragweeds and thistles are fully emerged. Ragweeds have just recently emerged in west KY and should start to appear in southern IL by end of this week. Other northern regions will have to wait for ragweeds, thistles and garlic to emerge and get sufficient growth to obtain good control. Any ryegrass applications in KY need to be applied in the next ten days.

SPRING BROADLEAF WEED CONTROL

Winter annuals such as chickweed are capable of forming dense mats that can smother out wheat and need to be controlled early in the spring. Chickweed grows very well at low temperatures and responds rapidly to early nitrogen applications. Many other weeds can be controlled effectively with much later applications. Fields can usually be split into two groups according to weed spectrum.

1. EARLY COMPETING WINTER ANNUALS WITH NO THISTLE, GARLIC OR GIANT RAGWEED PROBLEMS:

If the predominant problems are winter annuals such as chickweed, henbit and pennycress and no late emerging weeds are expected, spraying can begin immediately provided the weather conditions are suitable and target weeds are actively growing. Major chickweed infestations need addressing promptly now the weather has warmed up as they will rapidly get out of hand over the next 2-3 weeks.

2. LATE COMPETING GARLIC, THISTLES AND GIANT RAGWEEDS WITH FEW WINTER ANNUALS:

When the predominant weed species in a field exhibit late emergence or are slow to respond to the warming in spring, any herbicide application might need to be delayed. It is important that all ragweeds and thistles have emerged and that the garlic plants have become erect recovering from winter. In southern Illinois, Indiana and Ohio ragweeds and thistles should emerge very soon, and garlic is close to being ready to spray. In northern regions and in Michigan ragweeds and thistles are not emerged and need extra time before any herbicide applications begin. In general you need to wait 5-10 days after the first thistles and ragweeds are seen before starting to spray.

In some cases, low to moderate populations of both groups will be present in a field. If so, weigh the options and determine which are the most important weed species present and compromise between the two timings.

When applying herbicides, it is important to have 7-10 days of active weed growth prior to spraying as well as 5-7 days of good weather after spraying to ensure good control and minimal crop damage. Weeds are starting to actively grow and as long as we stay away from sub 25° F temperatures herbicides should work well if we can get sufficient dry weather conditions to make an application. Remember that record low temperatures for early April can still be in the 15 - 20° range in southern IN/IL and OH.

It is very difficult to determine the amount of yield loss from weed competition as it is dependent on many factors including drilling date, weed species, weed population and weed size. Yield losses can range from 0-30 bu/acre not only from competition, but also due to lodging and harvest problems.

There are many weed species present in wheat fields in the soft red wheat growing areas of the US; the secret to good weed control is identifying the ones in your area which will cause significant yield loss. There are many weeds which can cause significant yield loss; however, due to low populations or limited geographical distribution, affect few fields. Vetch, pennycress and corn buttercup fall into this group. Henbit and whitlow grass are common in most fields, but cause only minimal yield damage. Chickweed is probably the most common weed that causes major yield losses and is present in the majority of growing regions in the Midwest.

It is very important to scout each field to determine its individual weed spectrum. Unfortunately, fields will rarely have a uniform weed problem. Often, weed populations will exceed threshold limits on a portion of a field, leaving the remainder of the area with a tolerable level of weeds. In a few cases, fields can be divided in order to target specific weeds (spot spraying). However, more times than not, areas left untreated will develop greater problems than expected. Once the fields have been scouted, use Table 1 as a guideline for selecting an appropriate herbicide combination.



TABLE 1

WEED SPECIES	HARMONY EXTRA ¹ 0.3 OZ + 2,4-D ² 6 OZ	HARMONY EXTRA 0.5 OZ + 2,4-D 6 OZ	EXPRESS ¹ 0.33 OZ + 2,4-D 6 OZ	PEAK ^{1,3} 0.5 OZ + 2,4-D 6 OZ
chickweed	S ⁴	S	S	S
mouse ear chickweed	S	S	S	S
whitlow grass	S	S	S	S
henbit	MS	S	MS	MR
red dead nettle	MR	MS	-	MR
shepherd's purse	S	S	MS	S
pennycress	S	S	S	S
treacle mustard	S	S	S	S
corn buttercup	MS	S	-	MS
buttercup	MS	S	-	MS
Cressleaf Groundsel	MS ⁵	S ⁵	S ⁵	S ⁵
dock	MS	S	MS	MS
garlic	MS	S	MS	S
giant ragweed	MS	S	-	S
Canada thistle	MR	MS	S	MS
star of Bethlehem	MR	S	-	MS
catchweed bedstraw	MR	MS	MR	MR

1. Harmony Extra, Express and Peak combinations require an 80% non ionic surfactant at 1qt/100 gallons water
2. 2,4-D rates based on 3.7 lb/gal low volatility ester formulations
3. **DO NOT doublecrop soybeans** in fields after Peak application
4. Susceptibility ratings based on seedling plants 3-4" in size, larger or less actively growing weeds may require higher rates (ratings based on Wheat Tech, Inc. experience - **always refer to the manufacturers label for specific use information**)
5. Cressleaf groundsel/yellow rocket has been found to be resistant in places to SU chemistries and may require high rates of 2,4-D in some situations for adequate control.

**Common Chickweed****Cressleaf Groundsel**

Southern areas of Illinois, Indiana and Ohio typically have problems with garlic that necessitates using Harmony Extra on many acres. Further north the garlic fades out to be replaced by Canada thistles and/or giant ragweeds as the predominant weed problem. In situations where weeds are small or if few difficult to control weeds such as garlic, giant ragweeds and henbit are present, low rates of Harmony Extra mixed with 2,4-D work well (Table 2). As the weed size increases and garlic, henbit and other less susceptible weeds are included, it becomes necessary to increase the rate of Harmony Extra to 0.5 oz. Corn gromwell, red dead nettle, vetch, corn buttercups, Canada thistle, star of Bethlehem and very large garlic (10-15") require the higher rate (up to 0.6 oz) of Harmony Extra for adequate control. If vetch or Canada thistle are a problem increasing the 2,4-D rate to 8-10 fl oz/acre will aid in control provided the wheat is fully tillered, but not jointed.

In many areas weed control programs consist of 2,4-D or 2,4-D/Banvel combinations at relatively high rates. The problem with these compounds is usually not weed control as the weed spectrum for Banvel is very good. 2,4-D is very weak on chickweed and henbit, but both products are excellent on weeds in the mustard family.

The big problem is the potential of crop injury and yield loss from incorrect timing of these products. All products containing Banvel or 2,4-D should be applied after green up and prior to jointing. Unfortunately, most fields are at or beyond the safe growth stage for application before the thistles and ragweeds are emerged sufficiently to spray, increasing the potential for major crop injury. We strongly recommend staying away from Banvel/high rate 2,4-D applications on wheat that is jointed. It is very important to make applications with these products on time.

Many of these product combinations are effective against thistles, but are not as effective on winter annuals. In many cases the chickweed, corn buttercup or star of Bethlehem could pose a more significant threat to yields than the thistles; therefore, herbicide selection, based on field scouting is key for proper weed control. We do not usually recommend either one of these products at high rates due to the potential for crop damage as well as the limited weed control spectrum.



TABLE 2

PROBLEM WEEDS PRESENT	WEED SIZE	PRODUCT ¹	RATE/A	CROP STAGE
chickweed, pennycress, shepherd's purse, treacle mustard, whitlow grass	2-3"	Harmony Extra + 2,4-D ²	0.3 oz + 6 fl oz	4-5
chickweed, pennycress, shepherd's purse, treacle mustard, whitlow grass, henbit, corn gromwell, mayweed, docks, garlic, giant ragweed, red dead nettle.	4-6"	Harmony Extra + 2,4-D	0.5 oz + 6 fl oz	5-6
chickweed, pennycress, shepherd's purse, treacle mustard, whitlow grass, henbit, corn gromwell, , mayweed, docks, garlic, giant ragweed, red dead nettle, star of Bethlehem, corn buttercup, vetch, Canada thistle (suppression only)	4-6"	Harmony Extra + 2,4-D	.6 oz + 6 fl oz	5-6
chickweed, pennycress, shepherd's purse, treacle mustard, whitlow grass, henbit, mayweed, buttercups, vetch, garlic, Canada thistle (moderate control)	4-6"	Express + 2,4-D	0.25 oz + 6 fl oz	5-6

1. Harmony Extra, Express and Peak combinations require an 80% non ionic surfactant at 1qt/100 gallons water, 2,4-D rates based on 3.7 lb/gal low volatility ester formulations
2. 2,4-D applications need to be made prior to GS 6 to avoid potential crop damage.

Catchweed bedstraw is an increasing problem in many fields, but unfortunately is moderately resistant to most spring herbicides. Applications of Harmony Extra in combination with 2,4-D offer some suppression which has proved moderately effective. Aim should also offer us an opportunity for controlling this weed at higher rates unfortunately Aim has many gaps in its spectrum, chickweed and garlic in particular are present in most fields and Aim is ineffective on both. This means Aim needs to be mixed with Harmony extra in most cases making it uneconomic.

Express combinations are more active in controlling Canada thistle than Harmony Extra combinations, so switching to 0.25-0.33 oz Express is justified in heavy thistle populations. Generally, Express has a reduced weed spectrum and is more likely to cause stunting than Harmony Extra, so in non thistle or low thistle situations Harmony Extra is a better choice. When making a herbicide selection for fields with thistles as the predominant weed present, consider one of the following programs in Table 3 depending on the thistle population as well as the additional weed species present.



TABLE 3

THISTLE DENSITY	PRODUCT	RATE/ACRE	CROP STAGE	WEAKNESSES	THISTLE CONTROL
low	Harmony Extra* 2,4-D	0.5 oz 6 oz	5-6	thistles	mod-good suppression
low	Peak* ^y 2,4-D	0.5 oz 6 oz	5-6	thistles	mod-good suppression
low	Express* 2,4-D	0.25 oz 6 fl oz	5-6	severe thistles, garlic	mod-good suppression
moderate	Harmony Extra* 2,4-D	0.6 oz 8 fl oz	5-6	severe thistles	good suppression
moderate	Express 2,4-D	0.33 oz 6 fl oz	5-6	garlic	good suppression
moderate	Banvel 2,4-D	4 oz 8 fl oz	5	garlic, crop damage	good suppression

* Harmony Extra, Peak and Express combinations require an 80% non ionic surfactant at 1qt/100 gallons water, all 2,4-D rates based on 3.7 lb/gal low volatility ester formulations

^y do not double crop soybeans into fields sprayed with Peak

In most cases either the Harmony Extra or Express combinations will provide adequate control as these are both good broad spectrum approaches. Again, Banvel should only be used at GS 4-5; if in doubt as to what growth stage the crop is in, do not spray. For severe thistle problems in areas where doublecropping is not an option you can also consider using either Stinger or Curtail M.

SPRING GRASS CONTROL

Most grass weed problems should have been dealt with last fall. Cheat is quick to grow in the spring and rapidly becomes too large to control. Several fields in southern Illinois also have moderate to severe problems with other grass weeds including foxtail and bluegrass species. Attempts at spring control often provide less than satisfactory results. Our best options for control of bluegrass, foxtails and cheat are Maverick, Olympus and Osprey either alone or in combination. Table 4 shows some potential spray combinations for grass weeds other than ryegrass.

TABLE 4

PRODUCT	RATE/ACRE	CROP STAGE	TARGET WEEDS	COMMENTS
Maverick	0.66 oz + 2 quarts surf/100galls	4-6	Brome species	Restriction to soybeans
Olympus	0.6 - 0.9 oz + 2 quarts surf/100galls	4-6	Brome species	Restriction to soybeans
Olympus Flex*	3-3.5oz + 2qts surf/100 galls + 2 qts 28%/acre	4-6	Brome species + bluegrass + foxtail + ryegrass	Restriction to soybeans
Osprey*	4.75oz + 2qts surf/100 galls + 2 qts 28%/acre	4-6	Bluegrass + foxtail + ryegrass	No soybean restriction

* avoid applying Osprey or Olympus flex within 14 days of a spring nitrogen topdress application to avoid crop injury.

In all cases apply as soon as possible in the spring after the grass starts to grow, all products work better on ryegrass that has not started to tiller and control on multi-tillered grass weeds is always less than desirable. Only Osprey has no rotational restriction to soybeans, all of the others have varying restrictions. In some cases STS soybeans will permit the planting of soybeans but you should check the Label for your state.



1-2 Tiller Ryegrass



Any lingering ryegrass problems should be sprayed as soon as the weather and ground conditions are suitable. Most fall emerged ryegrass has started to several tillers, while January emerging ryegrass is mostly 2-4leaf. Table 5 lists three options for spring ryegrass control.

TABLE 5

PRODUCT	RATE/ACRE	CROP STAGE	COMMENTS
Osprey*	4.75oz + 2qts surf/100 galls + 2 qts 28%/acre	4-6	Best on big ryegrass but be sure to use correct surfactant
Axial	8.2 oz + 9.6oz Adigor surf/acre	4-8	Not as good on very big ryegrass but safer within 14 days of N apps, has 120 double crop restriction on label
Hoelon	2.5 pints	4-6	Can have resistance issues in certain areas but safe and no double crop issues.

*avoid applying Osprey or Olympus flex within 14 days of a spring nitrogen topdress application to avoid crop injury.

Osprey is by far the best option if you have seen resistance issues but care should be taken close to N applications.

In most case ryegrass grass herbicides should be applied 2-3 weeks prior to broad-leaf herbicide applications so tank mixing should not be necessary, however should application timings coincide. Harmony Extra can be tank mixed with all of these products with the exception of Hoelon. In all cases of multiple tank mix partners double check the product labels.

APHID CONTROL

Aphid numbers are extremely low in sprayed fields but most fields that were not sprayed in the fall have aphids that overwintered especially in KY and Southern IN/IL. We have also seen some winged aphids in west KY/TN but not north of the Ohio river yet. Northern areas currently have no aphids, but could increase in the next 2-4 weeks. The presence of occasional winged aphids could increase populations rapidly over the next 3-4 weeks so numbers need to be monitored.

Scout all fields, paying particular attention to those planted early where no insecticide applications have been made. It is important to remember that a very few aphids can cause a significant barley yellow dwarf problem and that aphid numbers can and usually do increase very rapidly in early spring. Kentucky data from 1992-2000 (Table 6) shows an average of 8.7 bu/acre yield increase with a spring insecticide application. In springs with high aphid numbers yield responses of 10-15bu are possible, in years where the aphid numbers were lower then the response was more like 4-6 bu/acre which still offers a good return on a \$5 investment.

It is still to early to tell if the aphid numbers will be a big or a small problem, although it is beginning to look like a year with higher than normal aphid populations.

TABLE 6 - data from Wheat Tech, Inc. plots

TREATMENT	'93	'94	'95	'96	'97	'98	'99	'00	AVE
yield (bushels/acre)									
non treated	86	125	82	114	91	75	95	92	94.6
mid March insecticide	96	129	95	119	96	86	110	98	103.3

In northern Indiana in 1998 and 1999 the yield advantage to a single mid to late March treatment was 9.3 bu/acre.

Barley yellow dwarf virus (BYDV) symptoms appear as small (2-3 ft), round, stunted areas in the crop. Infected wheat is generally 4-6 inches shorter with yellow leaf tips. Fall infection causes severe height reduction, while late spring infections result in yellow flag leaves, but little stunting. Most spring infection symptoms do not become evident until April.

Normally, we would expect most fields to have at least low to moderate levels of aphids during spring green up, this year is shaping up to have above average levels. Our strategy, as always, will be to wait until populations reach threshold levels.

Many fields will receive a herbicide application in the next 2-4 weeks and tank mixing a pyrethroid is a very cost effective method of aphid control. Aphid numbers are affected by drilling date, previous crop and proximity to topographical features such as waterways and woodlands. Usually, aphid populations will build up more rapidly in earlier planted wheat (near the Hessian fly free date) and in small fields surrounded by woodlands or pastures. Observe 5-10 spots in a field, counting the number of aphids/ft of row. Aphid numbers above 10/ft of row from early greenup to GS 8 should be sprayed promptly. Aphids will quite often be present in the whorl or on the underside of the lower wheat leaves. Numbers are usually higher around field perimeters and near grass waterways. The threshold for aphids increases dramatically after G.S. 8-9. After GS 8-9, fields generally do not need to be sprayed for aphids unless there are significant numbers present on the wheat heads.

There are several very effective pyrethroids for aphid control. Warrior, Mustang Max and Baythroid are all very effective insecticides. There are also several generic versions of Warrior (Lambda Cylohathrin) that should work well, Helena Lambda is good example of a very effective generic product that should work very effectively. There are also several look a like formulations of Gamma Cylohathrin that have different active ingredient concentrations. Our data at this time is very limited on Gamma products so Wheat Tech would suggest avoiding this product at the present time. Due to the large number of products involved it is difficult to recommend rates but usually with Warrior, Mustang Max and Baythroid good control can be achieved with the lowest recommended label rates.



2ND NITROGEN APPLICATIONS

Most fields throughout the region are still maintaining good color and showing few signs of nitrogen deficiency. Fields in southern counties especially in Illinois which are approaching GS 6 will require nitrogen soon. Fields that received 35-45 lbs N early in particular will have to be applied first. Once the wheat starts losing color and/or tiller numbers drop to 35-40/foot, the remaining nitrogen should be applied. Also fields with significant heaving and stand problems should be inspected for plant numbers and once the decision has been made to keep the field then the remaining N should be applied to make sure that the nitrogen levels are always adequate for maximum tillering. We will be recommending nitrogen applications for southern counties of Illinois, Indiana and Ohio over the next 7-14 days and wait 20-40 days for the more northern regions.

The early spring nitrogen recommendations contained sufficient information to calculate the additional rate of nitrogen to apply. As a general rule we will tend to stick with 90-100 lbs spring N rates in fields with good color and/or higher expected residual nitrogen (low corn/high soybean yields). Higher rates (up to 120 lbs N) may be need to be used in fields with low organic matter especially if the soil type is poorly drained.

Remember that being too early promotes lodging and freeze damage, while late applications cause nitrogen deficiency and yield loss. If you have not been able to make any nitrogen applications so far or if the weather delays you significantly when making your second application, remember that ammonium nitrate or 28% UAN solution will be taken up much more rapidly than urea. This can result in yield advantages over urea. If you do wish to use UAN try to use Hydro Chafer stream bars for application rates above 15 gallons.

In general we are very optimistic that the current yield potential for wheat is much above average due to excellent stands, tiller numbers and lack of winter injury. The biggest issue we still have to deal with is early planting dates and advanced growth stages of the wheat in certain areas, this is particularly true in southern IL where a large percentage of the wheat crop is very advanced for mid March and may well be damaged by any late spring freezes. If growers used the correct varieties and drill dates then they should be fine.

Hopefully this will turn out to be a very productive wheat season, the next 20-30 days will have a big impact on the final crop yield so we need to keep our fingers crossed.