Cornell Cooperative Extension
South Central NY Dairy and Field Crops Program
Broome * Cayuga * Chemung * Cortland * Tioga * Tompkins
DAIRY & FIELD CROPS DIGEST
Spring 2024

# Opportunities For Agriculture are Abundant Today

*By Janice Degni, Area Extension Field Crop Specialist*

Climate resilience is a term we see/hear often in the ag press. We have all experienced the negative consequences of extreme weather events from the highly erosive heavy downpours, to yield depressing dry spells, hail damage, late spring or early fall frosts to serious flooding and standing water in fields. Resilience is about the ability to recover from such crop stress or damaging events. We also know that practices that support soil health improve resiliency. Cover crops is one of the easier practices to implement that protects our soil from erosion, provides fresh organic matter and living roots to feed soil microbiology and improve how well soil holds together (aggregation), and contributes to nutrient cycling.

Today there many federal USDA and State programs with funding to support adoption of a large suite of practices that farms can access to increase the resiliency of their systems while practicing environmental stewardship. It takes an investment of time and relationship building on the part of producers and agency staff to identify the best suited funding sources for your farm and production system. Reach out and get to know your Natural Resources Conservation Service (NRCS) conservationists and local Soil and Water Conservation (SWCD) staff. Register your farm with your local Farm Service Agency (FSA) office. The staff at the USDA offices and SWCD office are the 'experts' to guide you to funding sources that will fit your needs. They will help with planning practices, alert you to the timing of funding cycles and practice agreements.

The SWCDs administer the Ag Environmental Program (AEM; https://agriculture.ny.gov/soil-and-water/agricultural-environmental-management). AEM helps to identify existing stewardship and environmental and management concerns for a farm using an inventory process, develop a plan for improvement, and seek funding for implementation. A significant source of funding is through the NYS Environmental Protection Fund via NYS Ag and Markets Soil and Water Conservation Committee.

If interested in any of these programs, start coordinating now with your local SWCD for current rounds or if more time is needed to develop a quality project, the programs are offered annually so you set the groundwork future rounds. The AEM programs include the:

- **AEM Base Program** – Funding for SWCDs to provide technical assistance as well as cost-share funding with farmers to implement BMP Systems in Tier 4. Up to $200,000 per district on a 2- year cycle for implementing BMPs.
- **Agricultural Non-Point Source Pollution Abatement and Control Program (AgNPS)** – is funded annually by NYS through your local SWCD. Approximately $13 million will be available for projects in Round 30. The request for proposals (RFP) is expected in the fall 2024. Program goals are achieved by using the AEM framework to protect water quality by the reduction and/or prevention of non-point source contributions from agricultural activities in watersheds across the State.
- **Climate Resilient Farming (CRF)** – The goals of this program are to support: greenhouse gas (GHG) mitigation, carbon sequestration, and adaptation and farm viability. CRF is also offered annually through your local SWCD.

In 2024 there will be four tracks:1. Livestock Management: Alternative Manure Management & Precision Feed Management, 2: Adaptation & Resiliency, 3: Healthy Soils NY, and 4: Agricultural Forest Management.

Significant funding ($19.5 B dollars for the US) has been provided to NRCS from the Inflation Reduction Act to be used through 2027. For details check here: NRCS and the Inflation Reduction Act FY2023.pdf (usda.gov) and NRCS-CSAF-Mitigation-Activities-List.pdf (usda.gov).

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The **South Central New York Dairy and Field Crops Program** is a Cornell Cooperative Extension partnership between Cornell University and the CCE Associations in 6 Counties.

# Cornell Cooperative Extension

South Central NY Dairy and Field Crops Program

We are pleased to provide you with this information as part of the Cooperative Extension Dairy and Field Crops Program serving Broome, Cayuga, Cortland, Chemung, Tioga and Tompkins Counties. **Anytime we may be of assistance to you, please do not hesitate to call.** Visit our website: http://scnydfc.cce.cornell.edu and find us on social media! Facebook, YouTube, & Twitter!


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***We put knowledge to work in pursuit of economic vitality, ecological sustainability, and social well-being. We bring local experience and research-based solutions together, helping our families and our community thrive in a rapidly changing world.***



# It's Time to Spring into an Apprenticeship

*By Jay Canzonier, Cornell University.*



**Staten Island Chuck, New York State's resident four-legged climatologist, has proclaimed that spring is just around the corner. Winter farm projects are wrapping up and the anticipation is blossoming on our farms.**

Have you added a new piece of equipment? Constructed a new building? Implemented a new employee development program to ensure your workforce is ready to meet the challenges of today's rapidly advancing dairy industry? If you answered YES to investing in capital improvements but NO to investing in staff development, you are putting the tractor before the people…a problem when it comes to overall farm productivity.

The Dairy Specialist Apprenticeship is an investment in employee development, without the financial anguish associated with new paint.

Dairy Specialist Apprenticeships:

- develop staff from within, while employees remain productive in their work.
- attract motivated employees and reduce turnover.
- earn businesses a reputation as industry leaders in providing high-quality employment and training opportunities.
- receive financial support from New York State.

**April marks the planting date for a new crop of Dairy Specialist Apprentices.** To find out how your employees can grow with it: Contact Jay Canzonier (jc3277@cornell.edu or 607-255-7890) at Cornell Agricultural Workforce Development.

The post It's Time to Spring Into an Apprenticeship appeared in The Ag Workforce Journal.

# Water Quality and Spray Application

*by Tom Wolf, Republished from https://sprayers101.com/water-quality/*

Water is one of the main inputs in a spray operation. The amount of water applied per acre is closely related to spray coverage and pesticide performance. But water quality – a term encompassing its cleanliness and chemical composition – is also critical to the performance of pesticides. Ensuring good performance means testing water and understanding the results.

There are four main water quality indicators related to pesticide performance:

**Water Hardness.** Water hardness is caused by positively charged minerals, primarily calcium and magnesium, but also sodium and iron. These cations can bind to some herbicides (glyphosate is the best-known example, also 2,4-D amine), reducing its performance. Hardness is usually named "Total Hardness (calculated)", based on the concentration of calcium and magnesium in the sample, and is expressed in ppm or mg/L of CaCO3 equivalent. Some tests refer to the older unit "Grains", which is ppm divided by 17. Bayer suggests that total water hardness should be below 350 ppm (20 grains) for the low rate (1/2 L/acre equivalent) of glyphosate, and below 700 ppm for the higher rates.

**Bicarbonate.** Sometimes referred to as alkalinity, the bicarbonate ion can inhibit herbicide activity, and also make some herbicides more difficult to mix. The most commonly affected herbicides are members of the Group 1 modes of action, products like clethodim, sethoxydim, and others, as well as MCPA amine and 2,4-D amine. Definite guidelines are hard to find because the antagonistic effect of the bicarbonate ion depends on the presence of other ions such as sodium and calcium.

**pH.** This is a complex parameter because it is related to pesticide solubility, hard water antagonism, and pesticide degradation. In most cases, pH values between 4 and 7 are considered acceptable. But some herbicides, notably those in the Group 2 modes of action, have specific pH needs to dissolve properly. For example, the sulfonylureas (FMC products such as Refine, Express), triazolopyrimidines (Corteval products such as Frontline, Simplicity), Triazolones (Bayer products such as Varro, Velocity M3) and Sulfonylaminocarbonyltriazolinone (UPL products such as Everest) dissolve better at higher pH, whereas the imidazolinones (Odyssey, Pursuit, Ares) tend to require lower pH. Some Group 14 products such as saflufenacil (BASF products Heat, Eragon) also prefer higher pH values for solubility. Label directions are important, sometimes calling for specific adjuvants to adjust the pH prior to adding the pesticide. Some pesticides, particularly insecticides, can break down rapidly in higher pH water. The rate of breakdown is usually not of importance on a spray day but may matter if a mixed tank needs to be stored for many hours or days.

**Cleanliness / turbidity.** Water may contain suspended solids such as clay. Glyphosate and diquat (Reglone) are sensitive to this, as these chemicals are readily adsorbed to soil particles, and turbid water can reduce their effectiveness. This is also why dust generated by the sprayer can reduce these herbicides' performance.

**Ensuring good performance**

Select clean water sources and conduct a water test to identify possible problems. Well water is more likely to be hard than surface water. If a laboratory water test is not available, then some quick home testing can provide the necessary guidance. First, use a conductivity meter to test the electrical conductivity (EC) of the spray water. Although this test does not identify the ions present, it shows if a potential problem exists. EC values less than 500 µS/cm are considered safe. For values above 500, a hardness test is necessary to confirm the presence of antagonizing cations. Paper test strips compared to a colour scale are a quick way to determine hardness.

If you have done a water test and want to know what all the numbers mean, have a look here.

If the water is hard, a generally accepted solution is to add ammonium sulphate (AMS) fertilizer at rates between 1 – 3% w/v of 21-0-0-24 to the spray tank, preferably before adding the herbicide. Spray grade liquid concentrate AMS product is available from Bayer CropScience, Winfield United, and some other suppliers. The sulphate anions tie up the hard water cations, preventing them from antagonizing the herbicide. Liquid urea-ammonium nitrate (UAN, 28-0-0) has also been shown to improve herbicide activity for some products, but because it does not contain the sulphate ion, it is not as effective as AMS.

Certain weak organic acids can also function as water conditioners. For example, citric acid can chelate hard water ions so long as the pH is not too low, that is, the necessary dissociable groups are ionic. If the pH is very low, these groups will be protonated and the chelating action is suppressed.

Be careful when lowering pH. It does affect the solubility of many herbicides and possibly the function of some formulations. The outcome may be an unusable tank mix.

Caution is also advised when adding foliar fertilizer specialty products. Adding a blend of fertilizer salts, combined with associated changes in pH, can result in unpredictable interactions with pesticides and water, resulting in sticky precipitates that may be very difficult to clean out of tanks and plumbing. Ask for compatibility data, and always conduct a jar test to be sure that the planned mixture mixes as expected. A recent study shows the effects of adding herbicides to UAN and ammonium thio-sulphate (ATS) plus nitrate stabilizers, where mixing order is critical.

Turbidity is a problem with surface waters, especially in areas of clay soils and after surface runoff. If spray water is taken from a pond, its turbidity can be reduced by adding aluminum sulphate at rates between 10 to 60 mg/L of pond water. Thorough agitation is required, and 80 to 95% removal of turbidity is achieved within 24 to 48 h (technical information here).

Pesticide manufacturers are usually aware of potential problems when their products are used in poor quality water. Consult with your local rep to learn of know issues and solutions

## ABOUT TOM WOLF (NOZZLE_GUY)

Tom Wolf is based in Saskatoon, SK and has 33 years research experience in the spraying business. He obtained his BSA (1987) and M.Sc. (1991) in Plant Science at the University of Manitoba, and his Ph.D. (1996) in Agronomy from the Ohio State University. Tom focuses on practical advice that is research-based to improve the efficiency of producers.

# Guide to addressing dystocia

*By Daniela Gonzalez Carranza, CNY Dairy Management Specialist*

Dystocia is not desirable, but it is an inevitable situation that we will have to face from time to time, and repercussions for cows and calves are complex. For example, even slight assistance can have an impact on production and fertility, not to mention on calf morbidity and mortality. Regardless of your calving management system, it is crucial to understand the process and stages of parturition.

**What should we know about calving?**

Cows go through three stages of calving, and it starts days before calving when the calf's cortisol (stress hormone) triggers hormonal changes in the cow that initiates parturition.

**The first stage** refers to the cervix's dilatation and can last between 4-24 hours, depending on parity. As hormones dilate the cervix, other signs begin to show, for example, the first one can be isolation, and as the time to calve comes closer, the cow displays other signs such as raising the tail, increasing laying bouts, and paying attention to the abdomen.

Once the cow is dilated and the calf is in delivery position, **stage 2**, which is delivery of the calf, starts. It is considered that stage two starts once the cow has frequent abdominal contractions (ideally 2-3 per minute) and the "water bag" (amniotic sac) is shown. The normal duration of this second stage can go anywhere from 30 minutes to 2 hours for multiparous cows and 3-4 hours for primiparous cows. Stage 2 ends when the calf is born. **The third stage** is the expulsion of the placenta.

**When do I need to check?**

Assisting calvings can be challenging since each cow is different, and the process can be affected by various factors, including environmental conditions. However, here are some practical tips that can help determine whether intervention is necessary.

1. Once you recognize the cow is in stage 2, check progress every 30 minutes. If you don't know when the cow started stage 2, be patient and give time to monitor.
2. If the cow is in stage 2 and there is no progress in 30 minutes, you could proceed to do a vaginal exam.
3. If the cow is in stage 1 and there is no progress in 2-4 hours, you could proceed to do a vaginal exam.
4. Keep in mind if the cow is still having uterine contractions (2-3 per minute).

**How to do a vaginal exam?**

When doing a vaginal exam, always remember these golden rules:

◊ Cleanliness: Prepare and clean the vaginal area of the cow to reduce the risk of infections.

◊ Lubrication: Lubrication helps with friction, less force is needed and decreases the risk of injuries to the cow and calf.

The first step is to evaluate the cervix dilatation. No progress will be made if the cow is not dilatated enough for the calf to go through. The next step is to evaluate the calf's position or the reason for slow progress.

- What is the calf position, anterior (head first) or posterior (tail first)?
- Is the calf too big? Is the calf alive?
- Is there any obstruction?
- Is the water bag broken?

Some tips

- When identifying the front legs from the hind legs, two joints will flex in the same direction for the front legs. On the contrary, the two joints will flex in opposite directions for the hind legs.
- Always pull when the cow is having a contraction.
- When using chains, two loops (one above and one below the fetlock) will reduce the risk of injury for the calf.
- Rotation of the calf (90 degrees) can help avoid hip lock.
- When manipulating a leg inside the cow's uterus, protect the calf's hooves with your hand to avoid lacerations to the uterus.

There is no secret recipe for how to intervene in each dystocia, every case is different, and there may be difficult scenarios where you will need professional assistance from your veterinarian. Nonetheless, intervening calmly and precisely is crucial for a smooth transition into lactation, reducing injuries, and prioritizing the welfare of cows and calves.

Image 1. Cow in Stage 2, notice the attention to abdomen and

Image 2. Calving workshops delivered by Cornell Cooperative Extension

# Improving the Success of Interseeding Cover Crops in Corn

*Prepared by Greg Roth, Bill Curran, John Wallace, Department of Plant Science, Penn State University, Matthew Ryan, Soil and Crop Sciences Section, Cornell University and Steven Mirsky, Sustainable Ag Systems Laboratory, USDA-ARS*

***Please Note: Some of the herbicides listed may not have registration in NYS and cannot be used.***

***Interseeding cover crops in corn is a promising management practice that could improve the adoption of cover crops where they have not been feasible before. As with any new practice, to improve the odds of success, some attention to management is necessary. In this factsheet, we share some of the practices that can improve the potential of interseeding cover crops based on our work and the observations in the literature.***

**Field Selection**

Successful interseeding is a function of the relationship of the cover crop to the corn crop and its management. The ideal management probably varies a bit from region to region and field to field. The competitiveness of the corn crop and the degree of heat and drought stress in a region will impact the potential for success, fall biomass accumulation and potential interseeding management.

Our general recommendation is to target interseeding at the V5 to V7 stage of corn. At this stage, the potential for injury from short residual preemergence herbicides is reduced and the timing is good for sidedress N. Postemergent glyphosate or glufosinate (Liberty) could also be applied at this time if necessary to control escaped weeds prior to cover crop emergence. In most areas, we have been successful with this approach and have achieved respectable cover crop establishment. The amount of cover crop biomass accumulation in the fall will depend on a number of factors including cover crop species, corn hybrid maturity as well as planting and harvest dates, corn grain vs. silage, and soil fertility management.

The success of interseeding in our work and in others have shown that factors such as plant population, timing of interseeding and hybrid maturity can affect the successful establishment and cover crop growth in the fall. These factors should be adjusted if need be, to improve interseeding success in a particular area.

We have had reasonable success with corn populations up to 32,000 per acre with our typical recommendations. Others have found that reducing plant populations to 22,000 to 26,000 will improve establishment and increase the fall cover crop biomass. However, in most cases we don't want to be reducing corn populations to the extent that we will be impacting yield or profitability. Using hybrids or targeting fields where moderate corn populations would work is one management strategy to consider.

Earlier interseeding from V3-V5 has been successful in Canada and has increased establishment and cover crop biomass in the fall. This may be necessary in environments where the corn crop is too competitive for later interseeding. We have not evaluated interseeding prior to V5 corn and do have some concern for potential cover crop competition with corn. We suggest doing some experimentation on your farm in smaller fields or plots and testing which tactics work best for you. We have had some success with interseedings at later stages such as V8 but these are best targeted to fields with less competitive corn.

In more competitive environments, there could be benefit for earlier maturity hybrids. Often, these are shorter statured with earlier dry down and harvest. This will allow better light penetration in early fall and promote cover crop growth and development. Changes in hybrid maturity should be considered only if they are part of a whole farm management plan and not if they impact profitability. Often reduced drying costs, earlier harvest, improved prices and residual effects of cover cropping can offset modest yield penalties associated with earlier hybrids.

Interseeding cover crops will impact the weed management strategies in a field since some herbicides can impact the establishment of the cover crops. Fields with lots of weeds or with certain herbicide resistant weeds may not be good candidates for interseeding as these may require longer residual herbicides or multiple postemergence applications.

Over the last five years, we have evaluated some residual broadleaf and grass herbicides in corn for use with interseeding. The following information is based on these observations and lists our current recommendations for some herbicides that 1.) Will likely be a problem; 2.) Some that can be problematic particularly at full rates; and 3.) Some that are compatible with interseeded cover crops. Our goal is to provide recommendations that carry minimal risk for cover crop herbicide injury.

Our basic approach with herbicides and interseeding has been to use a no or short residual burndown herbicide or tillage followed by a glyphosate or glufosinate (Liberty) application prior to interseeding. The ability to use residual herbicides is a function of the type of cover crop being interseeded. When interseeding multiple species that include grasses, legumes, and Brassicas such as forage radish, then residual herbicide options are fewer. Single species cover crop (e.g. grass or legume) can allow greater herbicide choice (Table 1).

For corn that is not Roundup Ready or Liberty Link, similar preemergence programs can be used, but POST herbicide options do not include glyphosate or Liberty. The herbicides listed in Table 2 have limited residual activity and/or tolerance to grasses, legumes or Brassica species. These foliar herbicides must be applied prior to interseeding when weeds are small. This will generally be 3 to 5 weeks after corn planting and a week or more prior to interseeding. In organic systems, a combination of tillage and cultivation is used for weed control and herbicide impacts on cover crops are not a concern. If grazing of the cover crop is planned, most corn herbicides allow grazing of corn stalks although there is nothing on the herbicide labels concerning interseeded cover crops. Table 2.2-18 in the 2015/16 Penn State Agronomy Guide lists herbicide grazing restrictions for corn. We have had limited experience and less success interseeding in soybean. Full-season soybean is very competitive and it is difficult for interseeded cover crops to survive the intense shading when soybeans develop a closed canopy. Planting shorter-season varieties that are not as tall, planting soybeans a little later in the season such as in June or as double-crop soybean after a winter

*(Continued on page 6)*

*(Continued from page 5)*

| Cover Crop | Injury likely Active ingredient | Injury likely Key Products | Injury possible Active ingredient | Injury possible Key Products | Injury unlikely Active ingredient | Injury unlikely Key Products |
|---|---|---|---|---|---|---|
| Grass | atrazine (>1lb), nicosulfuron, pyroxasulfone, simazine, s-metolachlor, tembotrione, topramezone | Atrazine, others, Accent, Steadfast, Zidua, Anthem, Simazine, Dual, others, Capreno/Laudis, Armezon/Impact | acetochlor atrazine (<1 lb), dimethenamid, isoxaflutole, metribuzin, pendimethalin | Harness, Degree, Atrazine, Outlook, Balance, Corvus, Metribuzin, Prowl | clopyralid, dicamba, flumetsulam, halosulfuron, mesotrione, rimsulfuron, safluenacil | Stinger, Hornet, Banvel/Clarity, Python, Hornet, Permit, Callisto, Resolve, Basis, Sharpen |
| Legume | atrazine (>1 lb), clopyralid, Flumetsulam, Halosulfuron, Isoxaflutole, Mesotrione, pyoxasulfone, Simazine, Tembotrione, Topramezone | Atrazine, Stinger, Hornet, Python, Hornet, Permit, Corvus/Balance Callisto, Zidua, Anthem, Simazine, Capreno/Laudis, Armezon/Impact | acetochlor, atrazine (<1 lb), dicamba (PRE), dimethenmid, metribuzin, pendimethalin, s-metolachlor | Harness, Degree, Atrazine, Banvel/Clarity, Outlook, Metribuzin, Prowl, Dual, others | rimsulfuron, safluenacil | Resolve, Basis, Sharpen |
| Brassica | atrazine (>1 lb), Flumetsulam, halosulfuron, isoxaflutole, mesotrione, simazine | Atrazine,Python, Hornet, Permit, Balance/Corvus, Callisto, Simazine | atrazine (< 1lb), metribuzin, pendimethalin, pyroxasulfuone, tembotrione, topramezone | Atrazine, Metribuzin, Prowl, Zidua, Anthem, Capreno/Laudis, Armezon/Impact | acetochlor, clopyralid, dimethenamid, dicamba (PRE), pendimethalin, rimsulfuron, saflufenacil, s-metolachlor | Harness,Degree, Stinger, Hornet, Outlook, Banvel/Clarity, Prowl, Resolve/Basis, Sharpen, Dual, others |
| Grass/ legume/ Brassica mix | atrazine (>1 lb), clopyralid, flumetsulam halosulfuron, isoxaflutole, mesotrione, nicosulfuron, pyoxasulfone, simazine, s-metolachlor, tembotrione, topramezone | Atrazine, Stinger, Python, Permit, Corvus/Balance, Callisto, Accent, Zidua, Simazine, Dual, others, Capreno/Laudis, Armezon/Impact | acetochlor, atrazine (<1 lb), dicamba (PRE), dimethenamid, metribuzin, pendimethalin, tembotrione, topramezone | Harness, Degree, Atrazine, Banvel/Clarity, Outlook, Metribuzin, Prowl, Capreno/Laudis, Armezon/Impact | rimsulfuron, safluenacil | Resolve, Basis, Sharpen |

Table 1. The likelihood of herbicide injury to grasses, legumes, brassica species or mixtures when inter-seeded 5 to 7 weeks after corn planting. Injury likely indicates these herbicides should not be used when interseeding sensitive cover crop species. Injury possible indicates that there is potential to use these herbicides, but some injury may occur. Use these herbicides as setup programs (1/2 - 2/3X) prior to post herbicides. Herbicides in the Injury unlikely category can be used at normal (1X) rates and should allow safe establishment of specified cover crop species. This table does not list all products that contain these active ingredients.

| Tolerant cover crops | Active ingredient | Trade name |
|---|---|---|
| Grasses | bentazon | Basagran |
| Grasses | bromoxynil | Buctril |
| Grasses | carfentrazone | Aim |
| Grasses | dicamba | Clarity/Banvel/Status |
| Grasses | flumetsulam + clopyralid | Hornet |
| Grasses | fluthiacet | Cadet |
| Grasses | glufosinate | Liberty |
| Grasses | glyphosate | Roundup or other glyphosates |
| Grasses | halosulfuron | Permit |
| Grasses | halosulfuron + dicamba | Yukon |
| Grasses | mesotrione | Callisto |
| Grasses | rimsulfuron + thifensulfuron | Resolve Q |
| Grasses | thifensulfuron | Harmony |
| Legumes or Brassica species | bentazon | Basagran |
| Legumes or Brassica species | bromoxynil | Buctril |
| Legumes or Brassica species | carfentrazone | Aim |
| Legumes or Brassica species | fluthiacet | Cadet |
| Legumes or Brassica species | glufosinate | Liberty |
| Legumes or Brassica species | glyphosate | Roundup or other glyphosates |
| Legumes or Brassica species | thifensulfuron | Harmony |
| Grasses + Legumes or Brassica species | bentazon | Basagran |
| Grasses + Legumes or Brassica species | bromoxynil | Buctril |
| Grasses + Legumes or Brassica species | carfentrazone | Aim |
| Grasses + Legumes or Brassica species | fluthiacet | Cadet |
| Grasses + Legumes or Brassica species | glufosinate | Liberty |
| Grasses + Legumes or Brassica species | glyphosate | Roundup or other glyphosates |
| Grasses + Legumes or Brassica species | thifensulfuron | Harmony |

Table 2. Postemergence corn herbicides that have short residual activity or cover crop tolerance. Herbicides must be applied prior to interseeding cover crops

cereal in regions where this is common can allow for greater interseeding success. Residual soybean herbicides present the same concern for the success of the cover crop as corn herbicides. We have not tested residual soybean herbicides and interseeded cover crops, but provide the following guidelines based on our herbicide experience (Table 3).

**Species selection**

The ideal species for interseeding are those that are cool season, somewhat drought and shade tolerant and relatively easy to establish. These have mostly included annual ryegrass, and red and crimson clovers (See Table 4).

Annual ryegrasses are available as true annuals or Italian ryegrasses. The annual ryegrass are less expensive, and sometimes produce a bit more biomass, but they can head out in the fall and are more subject to winterkill. The Italian ryegrasses don't head out and often have superior winter hardiness. Most of our research has utilized annual ryegrass and we have less experience with Italian ryegrass. We suggest seeding ryegrass at 15 to 20 pounds per acre as a single species or 10-15 pounds per acre in a mix with clover.

Of the clovers, medium red clover has been the most successful in our research. It is fairly shade tolerant, has good winter hardiness and is less expensive than some other clovers. Be sure to properly inoculate legumes. Seed medium red clover at 8 to 10 pounds per acre as a single species or 5-8 pounds per acre in a mix with ryegrass.

An alternative to medium red clover is crimson clover. It often produces a bit more biomass in the fall after interseeding, but is subject to winterkill in Pennsylvania and North. Seed crimson clover at rates of 10-15 pounds per acre as a single species or 8-12 pounds per acre in a mix with ryegrass.

We have evaluated orchardgrass, Kentucky bluegrass, perennial ryegrass, tall fescue, and several other legumes such as hairy vetch, ladino clover, and yellow blossom sweet clover. Orchardgrass has worked fairly well and is more winter hardy than the ryegrass, while the other grasses have not been successful. We have had

**To read full article, visit https://kingsagriseeds.com/wp-content/uploads/2014/12/improving-the-success-of-interseeding-cover-crops-in-corn-1.pdf**

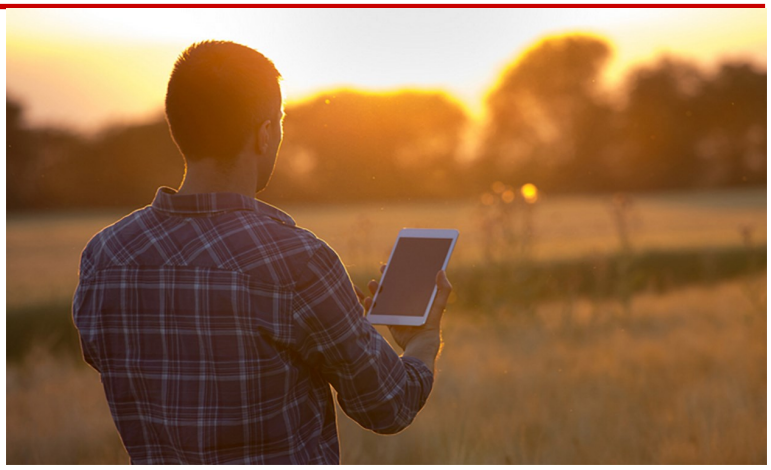
| Active ingredient | Trade names | Grasses | Legumes | Brassica species |
|---|---|---|---|---|
| chlorimuron | Classic, Canopy, Envive, etc. | OK | No | No |
| clethodim | Select | OK | OK | OK |
| cloransulam | FirstRate | OK | No | No |
| flumioxazin | Valor | OK | No | No |
| fomesafen | Flexstar, Reflex | OK | No | No |
| imazamox | Raptor | ? | OK | No |
| imazethapyr | Pursuit | No | OK | No |
| quizalofop | Assure, Targa | No | OK | OK |
| sulfentrazone | Authority | OK | No | No |

Table 3. Suitability of residual soybean herbicides for interseeded cover crops. Herbicides must be applied prior to cover crop interseeding.

# Now Is the Time To Make Your Weed Management Plan for the 2024 Growing Season

*Written collaboratively by Eric Jones, Philip Rozeboom, Jim Alms, and David Vos | Reprinted from https://extension.sdstate.edu/now-time-make-your-weed-management-plan-2024-growing-season*

As the 2023 harvest season comes to an end, now is the time to start formulating your weed management plan for next year. While purchasing herbicides, crop seed, and other inputs take priority after harvest, consider asking yourself the following questions to better prepare your operation for managing weeds next season.



**Questions to Consider**

**How was my weed management plan this year?**

If weed management this year was poor, the plan should change for next season. If weed management this year was excellent, the plan should still change for next season. The reason being that overreliance on the same weed management plan that provides excellent control will eventually select for weeds that can survive those controls (for example, spraying only glyphosate in glyphosate-tolerant crops year after year). However, if weed management was poor, consider implementing tactics that were not included this year. Inclusion of a preemergence herbicide, a residual herbicide mixed with a postemergence herbicide, or implementing non-herbicide weed control are things that may have been left out of the plan in 2023 but should be included in your plan for the 2024 season.

**Where were the weedy fields?**

Recording where the weedy fields are located helps know which fields will likely need to receive the most intensive weed management plan. These fields will also likely need to be scouted regularly to ensure control tactics are being executed in a timely manner.

**What weed species were present?**

Knowing what weed species were present will help with purchasing the correct herbicide; pre-and-postemergence. For example, if a field was inhabited by kochia, purchasing 2,4-D and glyphosate to treat that field will probably result in unsatisfactory control. Weed management should be treated on a field-to-field basis, as purchasing 2,4-D and glyphosate to treat a field inhabited with yellow foxtail and velvetleaf would likely result in satisfactory control.

**Can non-herbicide weed management easily be implemented?**

While herbicides are the most effective weed management tools, implementing non-herbicide weed control tactics can provide additional control and reduce the selection pressure for herbicide-resistant weeds. Easily implemented tactics include tillage (prescription tillage or adopting no-till), row spacing (for example, drill-planted soybean), mowing ditches and fence lines, and hand weeding small, isolated patches.

**Should a different crop rotation be implemented in certain fields?**

Crop rotation will allow for the use of different herbicides to control various weeds and reduce reliance on a single herbicide. Additionally, rotating to crops with a different lifecycle (for example, winter versus summer annual) can provide control by simply disrupting the lifecycle of weeds. Wheat and small grains are planted before many summer annual weeds and can be a physical barrier to germinating weed seeds. Weed management can also be implemented after wheat and small grain harvest to control weeds that are present, so seeds are not produced.

**Did any herbicide control failures occur not attributable to adverse weather conditions or misapplications?**

A control failure may not always mean herbicide-resistant weeds, but caution should be exercised where the failure occurred. Try to use a different herbicide from the previous year, use different herbicide in the pre-and-postemergence applications and utilize approved herbicide tank mixtures. If control failures still occur, report the problem so appropriate measures can be taken to determine if the weed is resistant or not.

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*(Continued from cover.)* **Example practices for each CRF track are listed below:**

| Livestock Management | Adaptation & Resiliency ** | Healthy Soils NY | Agricultural Forest Management*** |
|---|---|---|---|
| Alternative Manure Management & Precision Feed Management* | Riparian Buffer System | Cover crops | Tree planting (or natural forest regeneration) on underutilized Ag lands |
| Manure Storage Cover and Flare | Stream Corridor and Shoreline Management System | conservation tillage | Forest regeneration work in existing woodlands on farms |
| Solid Separation Equipment | Erosion Control System– Structural | structural soil conservation practices, | |
| Manure Management through Composting | Irrigation Water Management System | conservation crop rotations, buffers, etc. | |
| Bedding Alternatives to sand for cover and flare preparation | Access Control System | Equipment eligible expense • e.g., drag hose systems associated with improved nutrient management and soil health; | |
| Innovative Manure Treatment Technologies | Prescribed Rotational Grazing System | yield monitors and adaptive nutrient management; cover crop seeders; central tire inflation systems | |
| Pasture Based Management | Integrated Pest Management | | |
| Compost Bedded Pack | Weather monitoring systems and tools | | |
| Short-Term Collection and Transfer | Green Infrastructure Systems | | |
| Precision Feed Management | | | |

*For multi-step practices funding can be requested for each step, i.e. manure separation, then treatment technologies
** (Mgt for flood & drought)
*** Along with landowner goals, primary goal is carbon sequestration