

Guidance Document for Grazing of Cover Crops “To Graze or Not to Graze”

There have been several questions from field staff related to the Cover Crop standard and the management options available to producers when terminating cover crops and when grazing or harvesting is appropriate.

Conservation practice standards list purposes and criteria that must be met in order to meet the requirements of the standard. Practice standards list purposes for which the standard can be used. The purposes are generally specific natural resource conservation objectives. The conservation practice standards then list criteria that must minimally be met under a section entitled “General Criteria Applicable to All Purposes”. “Additional criteria” are also found in the standard to address each individual purpose.

The first step in planning cover crops is to determine the resource concerns and desired purposes for the cover crop. The purposes in the standard include reducing erosion, increasing soil organic matter (SOM), suppressing weed growth, managing soil moisture, reducing soil compaction, managing soil moisture, and perhaps the most important to capture, recycle, or redistribute nutrients in the soil profile. Note, that there is no purpose in the current Cover Crop standard related to “extending the grazing season” as there is in the Prescribed Grazing standard nor for the purpose of producing a grain crop. It is true that many of the species that are planted as cover crops can also be used for “extending the grazing season”. Livestock producers have been growing these crops for years as a means to extend the grazing season. Grazing of these crops can provide some additional benefit beyond just forage for animals. The important question that must be asked and answered is “will the allowance of grazing fully provide the intended benefits of a cover crop especially if the goal is for maximum forage production for the benefit of livestock?” Under any situation in which grazing of the cover crop is allowed, it must occur in a tightly managed manner.

The general criteria in the standard has recently been changed to state that the cover crop “will be terminated by harvest, frost, mowing, tillage, crimping, and/or herbicides in preparation for the following crop”. Farmers manage cover crops using a variety of techniques. The techniques selected by farmers are almost always dependent on the crop rotations in use, desired objectives for the cover crop, soil and water relationships, efficacy of the termination method(s), nutrient and pest considerations, influence of the cover crop(s) on the growth and development of the succeeding crop, and other factors. The standard lists the more common methods used to terminate cover crops. The list of termination methods is not intended to dictate or restrict one termination method over another. It is generally felt that grazing is not a suitable method of termination due to the time and number of animals it takes to graze the cover crop, and that grazing does not always results in a complete kill of the cover crop. Often, there is the need for continued control of the regrowth after grazing.

Guidance for Specific Purposes

- Erosion control –The cover crop has to have the “physical characteristics necessary to provide adequate soil protection”. Rusle2 should be used to determine if the proposed cover crop species and termination method will provide the amount of surface and/or canopy cover needed to provide the desired erosion control. A common scenario would be where oilseed radishes or turnips are planted and fall grazed. Will they provide adequate spring erosion protection? Generally speaking, not likely. A RUSLE 2 run will need to be performed to be certain. Two general items need to be noted. A) Radishes and Turnips planned for grazing will almost always include a grass crop such as oats, cereal rye, triticale, and/or annual ryegrass to provide the

necessary fiber for rumen function. B) The term “Tillage RadishTM” is a patented variety of oilseed radish. If cereal rye is seeded and fall grazed to appropriate heights, will the cereal rye regrow in the spring and provide adequate erosion control? Yes, in most cases. If Rusle2 shows that adequate erosion control is obtained with the fall grazing then grazing would be allowable. If not, then grazing would not be allowable. If Rusle2 shows that the cover crop can be harvested then these criteria would be met. Field offices should work with the farmer to make sure that HEL compliance requirements are met if grazing or harvesting is allowed.

- **Increasing Soil Organic Matter** – The basic goal is to produce high amounts of shoot and root biomass in order to maintain or add soil organic matter. For this purpose, the crop should be terminated, “as late as feasible to maximize plant biomass production”. The language in the criteria was purposefully vague. It is important to understand that cover crops are being utilized for the most part in corn and soybean rotations. Cover crops cannot be allowed to interfere with the growth and development of the cash crop. If farmers are expected to compromise cash crop yields for biomass then they will likely decline to adopt them. The termination date is dictated by the crop following the cover crop. For example, over wintering grass covers such as cereal rye or annual ryegrass will need to be terminated much earlier where corn will follow than where soybeans follow the cover crop. Another critical aspect is making sure that the cover crop doesn’t reach growth stages where termination becomes more difficult. A case in point is annual ryegrass. Even when soybeans are going to be planted, annual ryegrass can be much harder to control at later growth stages so a compromise has to be made between above ground biomass and effective, economical annual ryegrass termination. An additional note is that annual ryegrass produces a large amount of below-ground biomass. There was no specific amount of biomass established for the criteria because the absolute answer will vary with soils, climate, tillage practices, termination dates and methods etc. The tool that should be used by NRCS field offices to evaluate the impacts of cover crop termination methods on the potential to maintain or increase soil organic matter is the Soil Conditioning Index in RUSLE 2. In general, grazing, harvesting, and tillage are competing practices with increasing SOM.
- **Recycling nutrients** – There are a few aspects to the criteria. Is the purpose to keep nitrogen from leaching or scavenging nutrients such as phosphorus and potassium from deeper in the profile? If the purpose is to reduce nitrogen leaching, then the criteria states that the “cover crops will be established and actively growing before the expected period(s) of nutrient leaching”. In Illinois, nitrate leaching mostly occurs during a period beginning in fall through the spring. If the purpose is to provide captured nutrients to the next crop then, the criteria states that the cover crop should be killed “at a date that will match release of nutrients with the uptake of the following cash crop”. The idea is to allow the nutrients captured by non-leguminous plants to capture and release a portion of the needed nitrogen and other nutrients for the succeeding crop. Unfortunately, producers will need to implement cover crops for several years before the cycling of mobile nutrients such as nitrogen can be estimated and credited in a nutrient budget. The main goal of the “catch and release” effect of non-leguminous cover crops is to temporarily prevent the leaching of nitrates. Roughly 80 percent of the phosphorus and potassium consumed by livestock will be left in the field. On the other hand, harvesting for hay or silage will remove these nutrients. Nitrogen is mostly excreted in the urine and eventually will volatilize. Some nitrogen will remain in the manure.
- **Weed suppression** – Cover crops suppress weeds by competing for water, sunlight and nutrients while growing and by the mulching effect if the dead cover crop biomass is left on the soil surface. Some cover crops suppress weeds via allelopathy. According to the criteria, termination for weed suppression needs to occur as late as possible and residues left on the surface to maximize the allelopathic effects. Fall grazing could be a competing practice with this purpose depending on the crops grown. Limited fall/spring grazing could be allowed depending on the level of fall weed suppression that occurs and the potential for crop regrowth and spring weed suppression.

- Soil moisture management – The criteria states, “Cover crops established for moisture conservation shall be left on the soil surface.” The intent is to provide cover that will slow runoff and allow better infiltration of moisture as well as reduce evaporation losses. Complete fall grazing or harvesting of overwintering cover crops is a competing practice with this purpose.
- Soil compaction - Oilseed radishes or turnips can be used to alleviate or diminish compaction layers. Fall grazing must be carefully managed on wet soils and overwintering species should be included in the seed mix. Spring grazing should also be carefully managed on wet soils to reduce the potential for soil compaction.

In summary, the following guidelines should be met in order to incorporate fall or spring grazing into cover crops.

- Cover crops should be allowed to adequately develop a root system and crown before grazing is initiated.
- Any mixture that will be grazed in the fall needs at least one over wintering crop in the mixture such as cereal rye, annual ryegrass, triticale etc...
- Cover crops planned to be grazed should be seeded at rates listed in the IL Forage and Biomass Planting Practice (512) for annual planted forages.
- Minimum forage height before fall or spring grazing should be 8-12 inches.
- Minimum grazing height at livestock removal should be 4-6 inches per requirements in the 528 standard.
- Beginning and ending grazing forage heights should be documented using the “Documentation Record for Grazing Management IL 528-1” or other record keeping systems.
- Soil surface conditions should be dry or slightly moist, not saturated, in order to reduce the potential for compaction by livestock.
- Grazing of the cover crops should be done through flash grazing. Flash grazing is defined as: confining grazing animals to a specific portion of a grazing area for a limited time. Flash grazing usually refers to temporarily subdividing a grazing area into subunits with temporary fences so that grazing for short periods (1-2 days at most) can be achieved.