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Southern Rust Effects on Wintertime Corn Based Feed Stuffs

Southern rust (Puccinia polysora) is a fungal pathogen that infected a wide area of the Midwest's corn production acres in the 2025 growing season and has led to questions regarding the safety of feeding infested corn feedstuffs to livestock. Southern rust grows well under warm (77-88 ºF) and high humidity conditions. It can be identified by orange to brown raised lesions on the top leaf surface, with the underside of the leaf displaying yellow flecking, but no pustules. Open lesions will leave an orange to brown mark on fingers when touched or rubbed.

Common rust appears very similar to southern rust but produces lesions on both sides of corn leaves and is typically found in less abundance on the leaf surfaces and has shown to be much less yield threating. It is common to see both pathogens infesting the same leaf. Early infestations of these two pathogens can be difficult to distinguish, so utilizing a diagnostic lab, such as the MU Plant Diagnostic Clinic, to determine which species are present when symptoms first arise is a good practice. Common rust is typically much less threatening, due to more widespread hybrid resistance. Hybrid resistance, though limited, and fungicides can prove helpful in mitigating the threat of southern rust. Neither rust species overwinters in the Midwest, both arrive from the South, starting in tropical regions and working north as the season progresses.

While southern rust has not typically been as devastating of a problem in the Midwest as it has been in the Southern US (losses up to 25 bushels per acre), it does create standability issues due to stalk cannibalization and other fungal pathogen coinfection from stalk rot pathogens. Southern rust does not produce any known mycotoxins, however, side effects from infection can cause issues for livestock producers relying on corn-based feedstuffs such as silage, grain, and stover. Southern rust infestation leads to early dry down, yield loss in both grain and forage material, and reductions in nutritional value.
Early dry down (premature plant death) in corn infested with southern rust occurs due to orange pustules (fungal fruiting bodies) bursting through the corn plants epidermal leaf tissue, causing issues with the ability to regulate water loss. Early dry down reduces both grain yield potential and silage quality and quantity. Reduction in whole plant moisture from early dry down can result in less-than-optimal corn moisture levels for proper anaerobic fermentation. This poor fermentation environment can lead to higher silage pH values and butyric acid formation. Butyric acid can lead to feed refusal and ketosis in livestock.

Yield losses of both forage tonnage and grain are incurred when southern rust infestations occur due to the pathogen's parasitic nature of feeding off of plant photosynthates (glucose) and the reductions in total plant photosynthetic leaf area. Yield losses can begin occurring before 5% of the ear leaf is covered with lesions. Reduction in grain yield also means a reduction in starch (grain contributes most of the starch in an ensiled corn feed stuff). A reduction in starch means a reduction in energy. It has also been observed that digestibility can have declines in excess of 10%.

The general consensus is that southern rust does not produce toxic secondary metabolites or mycotoxins itself, but the disease can present opportunities for other mycotoxin- producing fungal species to coinfect corn plants under favorable environmental conditions. A couple examples include Fusarium and Gibberella stalk rots, which produce mycotoxins, such as

fumonisin B1 & B2 and deoxynivalenol (DON) and zearalenone, respectively. These stalk rots also encourage greater harvest losses due to poor standability. When feeding corn silage, grain, or stover, which has been infected with southern rust earlier in the season, it is advisable to look for other fungal diseases, namely stalk and ear rots, nearer to harvest. Producers should have a mycotoxin panel screening conducted before feeding the forage or grain and consider dilution with clean feedstuffs and various other mycotoxin mitigation strategies, depending upon the panel's test results.

Testing is advised due to the complications which arise from southern rust infection. It is also worth considering the use of silage inoculum products when using southern rust contaminated corn in silage. When testing corn-based feedstuffs, it is recommended to have a quantitative nitrate test performed, as well.

To learn more about southern rust and diseases that can cause mycotoxins, visit the Crop Protection Network website (cropprotectionnetwork.org), which is a product of multiple land grant universities.

Source: *Nick Wesslak, field specialist in agronomy*

Changes with New Tax Legislation - Part 2

The One Big Beautiful Bill Act (OB3) has many provisions related to taxes and is still being interpreted at the federal level. The following are just a few provisions and the actual legislation has many additional items.

Additional First Year (Bonus) Depreciation: The Tax Cuts and Jobs Act (TCJA) allowed 100 percent bonus depreciation through 2022 for qualifying property acquired and placed into service after September 27, 2017. It then established a phase-out over the next four years starting in 2022 in increments of 20 percent. For assets placed in service in 2025, the phase-out limits the bonus depreciation deduction to 40 percent of the basis. Bonus depreciation was scheduled to end in 2027.

The OB3 Act permanently increases bonus depreciation to 100 percent of basis for property acquired after January 19, 2025. For property placed in service during the first taxable year ending after January 19, 2025, taxpayers can elect to have 40 percent bonus depreciation apply.

Section 179 Expense Enhancements: A taxpayer may generally elect to treat the cost of any property as an expense, deductible for the tax year in which the property is placed into service. The maximum Section 179 (I.R.C. § 179) deduction for 2025 was scheduled to be $1.25 million, with an investment limit of $3.13 million. These higher amounts ($1 million / $2.5 million, indexed for inflation) were enacted by the TCJA and are adjusted for inflation each year.

The OB3 Act permanently increases the maximum Section 179 deduction to $2.5 million and increases the phaseout threshold amount to $4 million for property placed in service in taxable years beginning after 2024. These amounts will be indexed for inflation after 2025.

Charitable Deduction for Non-Itemizers: The OB3 Act creates a permanent charitable deduction for those who do not itemize. The deduction is limited to $1,000 for singles and $2,000 for married filing jointly (MFJ). This deduction applies to tax years beginning after December 31, 2025.

Charitable Contribution Deduction for Those Who Itemize: For taxpayers who itemize, OB3 imposes a new 0.5% floor on the charitable contribution deduction. So, an individual may only take a deduction for contribution amounts that exceed 0.5% of the contribution base (typically average gross income AGI). OB3 sets a floor of 1% for corporate charitable contributions.

Corporate charitable contributions are further limited to 10% of taxable income. OB3 makes permanent the individual contribution limit of 60% of contribution base for cash gifts to public charities. These changes are effective for tax years beginning after December 31, 2025.

1099-MISC and 1099-NEC Requirements: Current law requires those engaged in a trade or business to file an information return if the person makes payments to any person totaling $600 or more in the course of the trade or business. A copy of the Form 1099-NEC or 1099-MISC must also be provided to the payee. Form 1099-MISC is used to report nonwage income not covered by another 1099 form including legal settlements, prizes and rent. Form 1099 -NEC is used to report nonemployee compensation such as vendor/supplier payments to a consultant or contractor.

The OB3 Act increases the payment threshold for the 1099s to $2,000 per payee, beginning with payments made in 2026. For 2027 and subsequent years, the amount will be adjusted for inflation.

Trump Accounts: The OB3 Act creates a new type of tax-preferred savings account for children. These accounts are established as IRAs, but are not Roth IRAs, and there is no tax deduction for contributions.

The account must be established before the year the child turns 18 and the child must have a social security number. The contribution limit is $5,000 per year, indexed for inflation. Contributions are allowed until the year the beneficiary turns 18 years of age. No contributions can be made until 12 months after July 4, 2025 (the date of enactment). Parents and other relatives can contribute to Trump accounts. Additionally, employers can contribute up to $2,500 of the $5,000 yearly contribution, and the employer contribution is not gross income to the beneficiary or the parent. OB3 also allows other entities, non-profits, and governmental agencies to contribute to Trump Accounts. Contributions from these entities are not subject to the $5,000 limit, but these contributions must be provided to all children within a "qualified group". Some rollover contributions are allowed.

The OB3 Act creates a pilot program where the Secretary of the Treasury will contribute $1,000 into an eligible account of each qualifying child born (2025 – 2028). If a Trump Account has not been established for a child when a parent files a tax return, the IRS will create the account and notify the taxpayer responsible for the child. The Trump Account can be declined. To receive the $1,000 credit, a taxpayer with a qualifying child must include the social security numbers of both the taxpayer and the child on the tax return.

Earnings from Trump Accounts are not subject to tax until the money is distributed. Generally, no distributions from the account are permissible until the account holder reaches age 18. It appears that traditional IRA distribution rules apply, including potential early withdrawal penalties before age 59 ½ if not withdrawn for a qualified purpose such as secondary education or a first-time home purchase.

Investment options are limited to diversified U.S. equity index mutual funds or ETFs – no individual stocks or alternative assets allowed and must be opened through an IRS approved financial institution.

Source: *This article contains information written by Kristine Tidgren, Iowa State University, Center for Ag Law and Taxation*

Source: *Mary Sobba, field specialist in ag business*

Strategies and Practices to Strengthen Livestock Operations

With record high cattle prices, plentiful forage, including stockpiled forage, and many beneficial cost-share practices available, cattle and small ruminant producers should consider investing in operational improvements to be in a stronger financial position when prices cycle downward. The Missouri Drought Monitor at the time of this article showed most of northeast Missouri at D0, making it unlikely financial assistance will be available through the Farm Service Agency in the immediate future.

While many producers are looking to increase breeding stock numbers, high prices are making it challenging to keep replacement females. The USDA September 1, 2025 Cattle on Feed Report showed feedlot inventory down 1% from last year with placements down 10% which is below the expected trade estimate. With this bullish cattle market, consider opportunities to build carrying capacity by increasing livestock numbers and adding pounds. Investing now in genetics, pasture and water supply may improve returns over the lifetime of the investment.

Examples of multi-year investments include:

- Herd genetics
- Soil improvements
- Inter-seeding legumes
- Watering systems
- Fencing
- Grazing management

Even with the recent high cattle returns, it can initially be difficult to invest in improvements with the continued high input costs. Strategies to help ease the pain include:

- Prioritize improvements based on the farm business plan. Look at the most limiting factors – is it water, forage, beef quality/quantity, management, etc.? Then address those factors according to an intermediate to long range plan.

- Financial and technical resources can be found through the Soil and Water Conservation Districts (SWCDs), Natural Resource Conservation Service (NRCS), and University of Missouri Extension (MU Extension).

Source: *Darla Campbell, field specialist in business & communities*

Plant Processes Crucial for Growth and Survival

Plants go through several life cycle processes, which are important for plant growth and survival. In the fall, some plants turn from green to yellow, red or orange, while other plants produce flowers throughout the cooler months. Plants that fall over in a garden tend to grow upward, as do some flowers when in transport.

Photoperiodism

Photoperiodism is a plant's physiological response to the duration of light and dark in a 24-hour cycle, which helps synchronize developmental processes like flowering with seasonal changes. Plants perceive changes in day length to cue biological events, allowing maximum reproductive success. This response classifies plants into short-day plants, long-day plants, and day-neutral plants, where the length of the uninterrupted dark period is the crucial factor for triggering responses.

Both chrysanthemums and deciduous trees are triggered by the seasonal change in day length. Chrysanthemums are short-day plants and bloom when the days become shorter in late summer and fall, provided exposure to a long, uninterrupted period of darkness. Deciduous trees also respond to shortening days by ceasing chlorophyll production, which causes the green pigment in leaves to fade and reveals the underlying yellow and orange pigments called carotenoids. Cooler nights trigger the creation of new red and purple pigments called anthocyanins, contributing to the brilliant colors of autumn foliage. Therefore, while one responds by blooming and the other by changing color and preparing for dormancy, the initial trigger for both is the same reliable seasonal signal: the shorter days of late summer and autumn.

Geotropism

Geotropism, also known as gravitropism, is the directional

growth of a plant in response to gravity. It causes roots to grow downward into the soil and stems to grow upward. This response is governed by plant hormones called auxins. The accumulation of auxins on the lower side of a plant's stem promotes cell elongation, causing it to curve upward in a process called negative geotropism. In contrast, auxins inhibit cell growth in the roots and accumulate on the lower side causes the root to bend downward, a phenomenon known as positive geotropism. This gravity-driven growth is vital for a plant's survival, ensuring roots can anchor and access water and nutrients, while shoots can reach sunlight for photosynthesis.

Geotropism is demonstrated in a garden with plants that have stems which have fallen over but are still connected to the plant. The plant will send leaf shoots upward toward the sun instead of down into the ground. Some plants grow roots on the underside of the stems as they lay on the ground. Another example is gladiolus flowers that have been harvested, packed in boxes and shipped to florists. The flower stalk bends upward in response to gravity in shipping which is the reason gladiolus flowers used in floral arrangements have bent stems.

Thigmotropism

Thigmotropism is a plant's directional growth response to a touch or physical contact, allowing it to climb, grow stronger, or find support. This movement is achieved when the side of the plant in contact with an object grows slower, causing the opposite side to elongate and curl around the object. Examples include the coiling of tendrils on cucumber plants, grapevines and sweet peas, which improves a plant's ability to access light and support itself.

Thigmotropism works by:

- ***Touch stimulus***: A plant detects a physical stimulus, like a wall or another plant, when it makes contact.
- ***Hormonal response***: Hormones like auxin are involved, promoting growth.
- ***Differential growth***: The side of the stem touched experiences inhibited growth, while the non-contact side elongates faster.
- ***Curling:*** This differential growth causes the tendril or stem to curve and coil around the object, securing support for the plant.

Source: *Jennifer Schutter, field specialist in horticulture*