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MANAGEMENT FACTORS FOR MIDSOUTH SOYBEAN PRODUCTION

Nowadays, producers are well aware of what they need to do to maximize soybean yield potential. However, reminders that can be checked from start to finish of the growing season may prove useful to pinpoint those areas that require attention every year.

VARIETY SELECTION. Select varieties based on the below factors.

- **Proven Yield Potential.** Use variety trial information. Click [here](#) for links to the Midsouth states' variety trial information. Click [here](#) for links to private company variety trait data, and [here](#) for the MSU-ES variety short list.
- **Maturity Group.** Select based on desired length of growing season and drought and pest avoidance potential. Click [here](#) for details. Click [here](#) for details about [SOYMAP](#) and directions for its use to select appropriate MG for a given location and planting date.
- **Resistance to nematodes and diseases.** For varietal reaction to pests, click [here](#) for Mississippi ratings and [here](#) to access Arkansas ratings. Click [here](#) to access private company data that provide pest and nematode resistance ratings and information for their varieties.
- **Herbicide tolerance trait (HTT).** Use the myriad herbicide tolerance traits available in varieties to ensure that the largest number of [MOA](#)'s are used for weed management in soybeans. A list of available HTT's follows.
 - RR, GT = Roundup Ready, glyphosate-tolerant (tolerant to glyphosate herbicide)
 - RR2 = Roundup Ready 2 (tolerant to glyphosate herbicide);
 - [RR2Y = Roundup Ready 2 Yield](#) (tolerant to glyphosate herbicide);
 - [RR2X = Roundup Ready 2 Xtend](#) (tolerant to glyphosate and dicamba herbicides);
 - [LL = Liberty Link](#) (tolerant to glufosinate herbicide);
 - [STS or SR](#) = sulfonylurea-tolerant or sulfonylurea-ready [tolerant to sulfonyl-urea (ALS inhibitor) herbicides];
 - [E3 = Enlist E3](#) (tolerant to 2,4-D choline, glyphosate, and glufosinate herbicides);Click [here](#) for information on using these varieties to manage herbicide resistant weeds;
 - [LL GT27](#) = tolerant to glufosinate, glyphosate, and isoxaflutole or [Alite 27](#) (the only Group 27 herbicide labeled for application to these varieties);
 - [XF = XtendFlex](#) (tolerant to glyphosate, glufosinate, and dicamba herbicides);
 - CONV = Conventional (no herbicide tolerance).
- For ratings of varietal susceptibility to metribuzin which may be applied preemergence in some weed control systems, click [here](#).
- Click [here](#) for issues associated with use of auxin herbicides on resistant soybean varieties.
- Click [here](#) to access private seed company websites that contain each company's variety lists along with the HTT of each variety.
- **Iron Deficiency Chlorosis (IDC).** Click [here](#) to access a White Paper that contains information about this malady in soybean, on what field sites to expect it, and for variety ratings in Mississippi trials. See the [MSPB Scouting Guide](#), pages 102-104, for pictures of IDC symptoms. Use resistant/tolerant varieties on sites that have soil properties that will result in IDC-promoting conditions. The link to [private company variety trait data](#) will likely be the best source for this



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information. However, not all varieties within a company list will have IDC ratings.

TILLAGE. Click [here](#) to access a White Paper on this website that provides details about tillage use in Midsouth soybean production systems.

- Strive for a minimum/no tillage system. Use fall/spring tillage only where needed.
- For herbicide-resistant (HR) weed control, some form of tillage may be the only available remedy to control some HR weeds.
- To correct soil physical problems, know the soil type/series of a particular field in order to predict physical and/or chemical barriers so that an appropriate tillage operation can be used to remedy a soil problem that may limit expansive root growth.
- Use minimum or no tillage to reduce expenses, control erosion, and [preserve surface residue](#). Click [here](#) for help in deciding on tillage use and type. Click [here](#) for an article (p. 3) with links to information about using occasional/strategic tillage in a no-till production system.
- [Deep tillage](#) may benefit soybean production on some soils, and can offset the amount of irrigation water that will be applied when soybeans are grown on those sites that are irrigated.

SOIL FERTILITY. Maintain soil fertility levels, especially in high-yield environments, by taking soil samples and following recommendations from test results to re-supply soil nutrients according to previous yields and future yield goals. Click [here](#) to access articles on this website that deal with the myriad aspects of soil fertility.

- **Sample in the fall after harvest.** Click [here](#) to access sampling protocol.
- **Tissue testing.** Consistent high yields will remove significant amounts of fertilizer elements that must be replaced to maintain the soil fertility level needed for continued high yields. Use [tissue testing](#) to verify and/or identify deficiency or sufficiency of major plant nutrients during the

growing season so that corrective action can be applied prior to growing a following crop.

- Results from tissue testing cannot be used to correct nutrient deficiencies during the current growing season, but rather can be used in planning for future nutrient applications, or to validate the current fertility program for a specific crop. Thus, tissue testing for nutrient sufficiency or deficiency should be used in conjunction with results from soil tests.

FALL AND SPRING WEED BURNDOWN. Apply proper mix of fall/spring burndown herbicides.

- **Initial phase of HR weed management.** Add residual herbicides for HR weed management in fields with known HR weeds. Click [here](#) to access details.
- **Fall-applied herbicides.** Click [here](#), [here](#), and [here](#) for issues to consider when using this practice.
- **Herbicide MOA.** Use burndown and residual herbicides with differing MOA's prior to crop planting. Click [here](#) to access MOA details.

[PLANTING DATE.](#) Select based on the following factors.

- **Last spring frost date.** Match early planting time with estimated last spring frost date for a location. Click [here](#) to access details.
- **Drought avoidance.** Plant early-maturing varieties (late-MG III–mid-MG IV) early (before ~Apr. 20) to avoid highest summer temperatures and driest summer period.
- **Pest avoidance.** Plant early to avoid late-season insect and rust infestations. Click [here](#) to access Miss. research that confirms this. Conversely, late plantings must be scouted more intensely for foliage and pod feeding insects that almost always appear in mid- to late-summer in the Midsouth. When soybean rust appears in the region, it is almost always after early-maturing varieties that were planted early have reached the stage beyond which rust will not adversely affect yield.



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SEED TREATMENTS. Select and apply seed treatments based on the following factors.

- **Soil pest problems.** Select materials that control diseases, insects, and nematodes that pose a potential threat to production in individual fields; i.e., know a field's history of pest infestations in order to use only those seed treatment pesticides that are warranted. Applying unneeded seed treatment products will increase costs with no offsetting increased return. Click [here](#) to access a White Paper on this website that provides details about seed treatment materials to use for common seed- and soil-borne pests. Be aware that using the proper fungicide seed treatment is the most important issue to consider.
- **First line of defense.** Seed treatments will ensure that the effect of early-season pests are minimized and that an intended stand and maximum early-season growth are realized so that the advantage from planting early is realized. It is important to remember that a failed stand from early planting cannot be replaced—it can only be replanted at a later date with subsequent yield penalty.

EARLY-SEASON WEEDS. Manage for early season weed escapes, especially of HR weeds.

- **Control soon after planting.** This is needed to ensure minimum weed competition and maximum soybean yield potential. Check each post-emergence herbicide's label for maximum allowed weed size to assure optimum control. Rotate herbicide MOA's when possible.

CONTROL INSECTS AND DISEASES. All Midsouth soybean plantings are subject to infestation/infection by one or more insect and/or disease pests.

- **Time of insect infestation.** Many of the Midsouth's invasive insects, especially foliage feeders, are only problematic after the onset of reproductive development in later plantings. Thus, intense scouting for insect management should occur after R1 or beginning bloom in these

plantings.

- **Treatment thresholds.** Use thresholds for insect treatment decisions. Click [here](#) to access the most recent insect and disease management guides from Midsouth states, and [here](#) to access a White Paper that summarizes insect management details. These guides provide treatment thresholds for various insects and for insecticide products that are available to treat for insects when thresholds are reached.
- **Redbanded Stink Bug (RBSB).** This insect has now become one to account for, especially late in the season when soybeans are approaching maturity. Click [here](#) to access information about this insect and how it can be managed.
- **Disease calendar.** Click [here](#) for a calendar that will provide assistance in preparing for disease management decisions during the growing season.
- **Foliar fungicides.** Click [here](#) to access a White Paper that summarizes options for management of foliar diseases, and [here](#) to access the most recent Univ. of Arkansas guide that provides information about foliar fungicides that can be used to manage and/or control common diseases that infest soybeans in the Midsouth.
- **Disease management.** Click [here](#) to access general guidelines and resources that should be consulted for managing soybean diseases.
- Click [here](#) to access Disease Management Guides from Arkansas, Louisiana, Mississippi, and Tennessee.

NEMATODES. Take soil samples to determine presence and species of nematodes present, as well as HG type of soybean cyst nematode (SCN), in order to determine varieties to plant and other potential control measures such as rotational crops.

- **Sampling time and protocol.** Click [here](#) to access a White Paper that contains information about the best time to collect samples and proper sample collecting and handling procedures. Click [here](#) for tips to consider if sampling is delayed until spring.
- **Variety Trials.** Select varieties with known



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resistance to species and race/type that are present.

- **Crop Rotation.** The three nematodes of concern that affect soybeans in the Midsouth are the SCN, root-knot, and reniform. Each of these has different alternate host crops that will affect the choice of a rotational crop. Thus, a [rotational cropping system](#) should be planned according to the nematode species that is of major concern in order to avoid yield reductions.
- It has become increasingly important that varieties with resistance from sources other than PI 88788 be used when available. Click [here](#) to access information about this.

PESTICIDE APPLICATION. Consider nozzle type, tank-mix options, weather conditions, and time of day when applying all pesticides. Pesticide labels will specify the criteria for most of these factors.

- **Herbicide drift and spray nozzles.** Click [here](#) to access a White Paper that has information about selecting the spray nozzle that will produce the appropriate droplet size to both control targeted pests and reduce drift.
- **Calibration of pesticide application equipment.** Click [here](#) to access guidelines presented in an MSU-ES publication that will ensure proper sprayer calibration based on spray equipment factors.
- **Spraying time.** Click [here](#) to access what is known about the optimum time of day to spray foliar-applied herbicides on soybeans to realize their maximum efficacy against targeted weeds.

IRRIGATION. Use all available tools to ensure the most efficient application and use of irrigation water.

- **Irrigation setup.** Dan Roach, Ext. Associate, and Dr. Drew Gholson, MSU Irrigation Specialist, co-authored an article titled “[Pipe Planner: the Foundation Water Management Practice for Furrow Irrigated Soybeans](#)“. This article provides a summary of results from the MSPB-funded RISER project that defines the water savings that

can be gained by using [Pipe Planner](#), the computerized hole selection program that was developed by Delta Plastics to supplant NRCS’s PHAUCET irrigation management tool. Also, use [other tools](#) that will result in water conservation during irrigation.

- **Soil Moisture Sensors.** Use [soil moisture sensors](#) to accurately schedule irrigations according to plant stage and available water in the soil.
- Click [here](#) and [here](#) for information about soil and plant water relations and irrigation, and [here](#) for the “Mississippi Soybean Irrigation Guide” on this website.

HARVEST AIDS. These materials may be needed to make soybean harvest more efficient and/or to desiccate weeds that emerged and grew after in-season weed control activities were completed.

- **Materials and time of application.** Click [here](#) to access a White Paper on this website that provides guidelines about desiccation products and when they should be applied to soybeans to maintain yield potential and ensure pre-harvest interval.

The topics listed above should be considered for the 2023 production season. The content in the linked resources shown for each topic will provide up-to-date information that can be used to maximize soybean yield and economic return.

FACT SHEETS. Click [here](#) to access fact sheets that provide summaries of most of the above subjects.

*Composed by Larry G. Heatherly, Updated Feb. 2023,
larryh91746@gmail.com*