A FREE WISCONSIN DIRT GUIDE

DIY SUMMER SOIL-BUILDING MIX FOR WISCONSIN

A spring and summer cover crop for worn-out and sandy Wisconsin ground — what to keep, swap, and drop, three regional recipes, and how to plant, crimp, and follow it with a fall plot.

By Alex LaRoux · Wisconsin Dirt, Wautoma · A do-it-yourself recipe for building soil on Wisconsin ground.

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What this is for

Most food plot talk is about what deer eat. This guide is about the ground. If your plot is blowing sand, a worn-out field corner, or a spot where nothing has done much for years, the fastest way to change that is a summer of thick, diverse growth: lots of roots, a mix of legumes pulling nitrogen from the air, and a heavy mat you can crimp flat and drill your fall plot into.

I ran a commercial summer mix on my own sandy plots and it put down a great mat. That mix is built first as a deer forage blend. When the goal changes to **building soil** — biomass, root depth, nitrogen, weed control — and the ground is Wisconsin ground, a few changes make sense. This guide walks through what I'd keep, swap, or drop, and gives three Wisconsin versions.

> **What this is — and is not**
> DIY Summer Soil-Building Mix for Wisconsin is a **do-it-yourself recipe** for building soil on Wisconsin ground. If you want summer deer forage rather than soil building, use the Central WI Summer Blend in our free Central Wisconsin blends guide.

- **Central Sands DIY recipe** — the base recipe, for sand and loamy sand without irrigation.
- **Southern loam DIY recipe** — for silt loams and the longer season south of Highway 10.
- **Northwoods DIY recipe** — an oats, peas, and clover spring soil-building mix for the short northern season.
- Planting windows tied to real soil temperature data, seeding notes, termination timing and seed-set risks, and what to plant next.

What's in this mix, and why

Keep

- **Cowpeas — keep and raise.** USDA-NRCS Wisconsin rates cowpea excellent for heat and very good for drought and low fertility, with a preferred pH of 5.5–6.5, which fits acidic Central Sands ground. SARE's *Managing Cover Crops Profitably* calls cowpea a rugged survivor of drought once established, with typical biomass of 3,000–4,000 lb per acre. UW–Madison and the Midwest Cover Crops Council point to cowpea as a nitrogen-fixing legume that grows well in a short summer window.
- **Soybeans — keep, but cut.** Soybeans add nitrogen and deer browse them hard. NRCS Wisconsin says soybeans should not make up more than 20% of a cover mix, and rates them below cowpea as a soil builder and erosion fighter. I hold them at 8 lb so they stay inside the WI NRCS 340 cap of 20% of a mix.
- **Sunflower — keep a little.** NRCS rates sunflower very good for loosening subsoil, and it draws pollinators. But NRCS's single-species base rate is only 5 lb per acre, so in a mix a heavy sunflower share can shade the legumes. Both UW–Madison and the Midwest Cover Crops Council flag white mold risk, so skip it on fields with a white mold history.
- **Buckwheat — keep a little.** It covers ground in about two weeks, suppresses weeds, and SARE reports it pulls phosphorus far better than cereal grains. But it is a poor fit for a mat: NRCS gives its residue the lowest possible rating for lasting cover, SARE says it is not drought tolerant, and it can start flowering within three weeks. I keep 3 lb as a quick nurse canopy.

Swap

- **Grain sorghum → sorghum-sudangrass.** For soil building, sorghum-sudangrass is the better tool. UW–Madison Extension says it can make 3–5 tons of dry matter per acre in warm conditions with 60–80 lb of available nitrogen, is drought tolerant once established, and is excellent for weeds, erosion, nutrient scavenging, and organic matter. SARE

reports that one mowing at 3–4 feet tall can increase root mass five to eight times and push roots deeper. It also costs well under half as much per pound as food plot grain sorghum. The catch: UW says cool weather limits it, which makes it less desirable in northern counties.

• **Alyce clover → berseem clover (southern and northern recipes).** Alyce clover isn't on NRCS Wisconsin's cover crop species table, and it's the most expensive seed in the mix. Berseem is Wisconsin-listed, fast, upright, and winter-kills; UW–Madison notes up to a 40 lb nitrogen credit from a well-established stand. SARE warns it can struggle with drought on well-drained soil, so I leave clover out of the Sands recipe entirely.

Drop

• **Mung beans.** Not a bad plant — the Midwest Cover Crops Council lists it as a short-window summer legume. But it isn't on NRCS Wisconsin's species table, and cowpea already fills that role with stronger drought ratings and published biomass data. Dropping it puts more seed where it does the most work.

• **LabLab.** Not on NRCS Wisconsin's species table, and I found no Wisconsin trial data for it. Cut.

Add

• **Pearl millet (Sands).** NRCS rates it excellent for heat, drought, and low fertility, with long-lasting residue.

• **Sunn hemp (southern loams).** In Wisconsin trials on a Fox silt loam (2014–2017), sunn hemp produced high biomass and nitrogen, but yield fell about 1.3% for every day planting was delayed; the researchers recommend mid-June to mid-July planting. The Midwest Cover Crops Council notes its nitrogen benefit is greater in southern parts of the Midwest.

• **Oats, peas, and red clover (north).** A cool-season start that uses the spring the warm-season mix can't.

Why Wisconsin needs its own version

Soil temperature, not the calendar

A common summer-mix rule is soil at 60°F, 2 inches deep, at 9 a.m. I pulled three springs of 9 a.m. 2-inch soil temperatures from UW–Madison's Wisconet stations to see when that actually happens. The date shown is the first day of a five-day run at 60°F or warmer.

Wisconet station (soil)	2024	2025	2026	Median 32°F last spring freeze (NOAA 1991–2020)
Hancock — Central Sands	May 18	May 13	May 25	May 10 (1 year in 10: May 24)
Arlington — southern silt loam	June 1	June 15	June 4	May 4 (1 in 10: May 18)
Rhinelander — north	June 1	June 17	June 1	May 22 (1 in 10: June 4)
Spooner — northwest	June 12	June 16	June 3	May 14 (1 in 10: May 29)

Wisconet soil data via the Wisconet API (hourly 2-inch soil temperature at 9 a.m. Central). Wisconet's archive only goes back to 2023, so three springs is a short record; treat it as a pattern, not a forecast. Freeze dates: NOAA NCEI 1991–2020 normals (Hancock Exp. Farm, Arlington, Rhinelander, and Spooner Ag Research Station) via seasonplot.com.

Two things stand out. Sand warms fast: Hancock hit a steady 60°F **one to three weeks ahead** of the heavier soil at Arlington, even though Arlington is farther south. And the north is late at both ends: Rhinelander's median first fall freeze is September 24, which leaves a warm-season mix very little time before you need to plant a fall plot.

Official planting windows

NRCS Wisconsin's Cover Crops (340) guidance, Table 3, opens the window for sorghum-sudangrass, millets, cowpea, sunflower, and sunn hemp on **June 1** in both zones (buckwheat May 15, soybeans May 1). The windows close August 8 in the North zone and August 15 in the South. Sorghum-sudangrass, millets, and cowpea want 58–65°F soil, per NRCS and the Midwest Cover Crops Council, so 60°F is the floor, not the target.

Sand, and no irrigation

UW–Madison Extension puts plant-available water in a loamy sand at about 1.1 inches per foot of soil, versus 2.0–2.5 inches in a silt loam. On Central Sands ground, every species in a summer mix has to tolerate drought, which is why the Sands recipe leans on sorghum-sudangrass, pearl millet, and cowpea.

Recipe 1: Central Sands DIY recipe

For: sand and loamy sand in Waushara, Adams, Marquette, Portage, Waupaca, Green Lake, Wood, and Juneau counties, with no irrigation. **Total:** 43 lb per acre drilled.

Species	Lb/acre (drilled)	% of mix	Why it is here
Sorghum-sudangrass	10	23%	The engine. Swapped in for grain sorghum: more biomass, regrows after a mowing, and roots dig deeper when it is mowed once. Drought-tough once up.
Cowpeas	15	35%	The workhorse legume. Raised from about 8 lb. Excellent heat and very good drought and low-fertility ratings from NRCS, and it fits acid sand (pH 5.5–6.5).
Non-GMO soybeans	8	19%	Kept but cut from about 15 lb. Adds N and browse; NRCS caps soybeans at 20% of a cover mix.
Pearl millet	4	9%	Added. A second drought-proof grass with a fibrous root mass and long-lasting residue for the mat.
Sunflower	3	7%	Kept, cut from about 5 lb. Taproot for tight subsoil and pollinators; kept low so it doesn't shade the legumes.
Buckwheat	3	7%	Kept, cut from about 6 lb. Fast first canopy and a phosphorus scavenger, but it sets seed fast and its residue disappears.

Mixing your own makes the most sense across a few acres; for one small plot a premixed bag is simpler. This recipe needs cowpea and soybean inoculant.

When and how

Plant: June 1–15, once 2-inch soil holds 60°F for several mornings and the frost risk has passed, and ahead of a rain. **Drill:** large seeds (cowpea, soybean, sunflower, buckwheat, sorghum-sudangrass) about ¾–1 inch deep on dry sand; put pearl millet in a small-seed box or keep it near ½ inch. NRCS asks that diverse seed sizes be sorted into the right drill boxes. **Broadcast:** only into an open seedbed with incorporation; NRCS doesn't list a broadcast rate for cowpea, soybean, or sunflower. **Mow once** (optional): when the sorghum-sudangrass is 3–4 feet tall, leaving 6 inches of stubble, to drive roots deeper. **Terminate:** late July to early August, then drill the fall blend.

Recipe 2: Southern loam DIY recipe

For: silt loams and loams in southern Wisconsin (UW–Madison Extension uses Highway 10 as its north–south line; NRCS uses its own zone map for official dates), where there is more water, more season, and a later soil warm-up. **Total:** 44 lb per acre drilled.

Species	Lb/acre (drilled)	% of mix	Why it is here
Sorghum-sudangrass	10	23%	Same engine. Silt loam holds more water and N, so it has room to hit full biomass.
Cowpeas	10	23%	Still the main legume, trimmed to make room for sunn hemp.
Sunn hemp	5	11%	Added for southern ground. Wisconsin trials on silt loam: high biomass and N when planted early (mid-June to mid-July).
Non-GMO soybeans	8	18%	Same as the Sands version.
Pearl millet	3	7%	Trimmed; SxS carries most of the grass load here.
Berseem clover	3	7%	Swapped in for Alyce clover. Wisconsin-listed, fast, upright annual clover that winter-kills. Understory and N.
Buckwheat	3	7%	Same as the Sands version.
Sunflower	2	5%	Cut further. Skip it on fields with a white mold history (soybeans share that disease).

Plant about June 5–20 (Arlington's soil reached a steady 60°F between June 1 and June 15 in 2024–2026); plant sunn hemp early in that window. Inoculate cowpeas and soybeans; check the inoculant label for sunn hemp. Some berseem and red clover seed comes pre-inoculated. If you're terminating in early August for a fall plot, the mix gets about 8 weeks; if you can leave it until mid-August or frost, the southern season gives sorghum-sudangrass and sunn hemp more time to pile up biomass.

Recipe 3: Northwoods DIY recipe

For: northern Wisconsin, north of Highway 10. Up north, warm-season soil temperatures arrive in June and the fall plot has to be in by about early August, which leaves a warm-season mix only seven or eight weeks. UW–Madison also says cool weather limits sorghum-sudangrass in northern counties. So the north version uses **spring** instead. **Total:** 75 lb per acre drilled.

Species	Lb/acre (drilled)	% of mix	Why it is here
Spring oats	40	53%	Cool-season grass that germinates in cold soil (min. 38°F) and builds a crimpable straw mat by early July.
Spring forage peas	30	40%	Cool-season legume (min. 41°F) for N and biomass; climbs the oats.
Medium red clover	5	7%	Understory legume. If you crimp instead of spray, it survives into your fall plot.

Plant as soon as the ground can be worked, from about April 15 (when NRCS's window for oats and field peas opens in both zones) into mid-May. NRCS lists minimum germination temperatures of 38°F for oats and 41°F for peas. UW–Madison Extension lists mid-April spring oats and peas as yielding 2.5–3 tons of dry matter per acre by late June. Inoculate the peas (pea/vetch group). In late June or early July, once most of the oats are flowering, you can drill a summer cover into the standing oats and crimp behind it, or spray first if they aren't flowering yet. Plant the fall plot in late July or early August.

Want a warm-season mix up north anyway? Drop the sorghum-sudangrass and sunn hemp. Lean on buckwheat and German millet for fast cover, plus cowpeas and a few soybeans, and plant the first week the soil holds 60°F. Expect less biomass than the southern recipes.

Termination: timing and seed-set risk

NRCS Wisconsin's roller-crimper guidance: crimp grasses when most of the stand is at anthesis (flowering) or later, legumes at flowering or later, and always before seed set. The crimper should flatten the stand and break stems in three or more places, and you should crimp in the same direction you'll drill. NRCS also notes crimping can work *after* planting. If a crimp doesn't kill the stand, follow up with a second method.

Species	When to terminate	Risk if you wait
Buckwheat	Within 7–10 days after flowering starts (SARE). It flowers within about 3 weeks.	A June planting will drop some seed before a late-July termination. Volunteers come up in the fall plot, but buckwheat isn't frost tolerant, so the first frost ends them. That's why it's cut to 3 lb.
Sorghum-sudangrass	Mow once at 3–4 ft (6 in stubble) for roots; terminate before seed forms.	UW says mowing is likely needed to prevent seed production. Mowed alone, it regrows green until frost. Residue left on the surface gets tough and slow to break down.
Pearl millet	Before the seed heads harden.	Volunteer millet in the fall plot.
Cowpeas	Flowering or later.	SARE: mowing and rolling alone do not consistently kill cowpeas. Plan on herbicide (follow the label) or frost to finish them.
Sunflower	At bud to early flower.	Tall stalks are harder to crimp flat and drill through.
Oats + peas (north)	Oats at flowering or later; peas at flowering.	Crimped too early, oats stand back up and keep growing.

This season I sprayed, then crimped, then drilled the fall blend into the mat. After going through the termination research, the order I recommend is **spray, drill, then crimp**. **Spray** the standing mix first, because a roller alone won't kill it: University of Arkansas trials found only 40–60% kill on sorghum-sudan and 0–10% on cowpeas. Spraying before you seed also means you never spray over fall seedlings, which can be up in 3–5 days in August. **Drill** the fall blend into the cover while it's still standing, the same day or within about 3 days. UW–Madison's roller-crimper work plants into standing cover because it gives better seed-to-soil contact than a flattened mat, where straw hairpins into the slot. **Crimp** right behind the drill in the same direction so the mat lands on the rows and holds moisture on the sand. If sorghum-sudan is too tall or tangled to drill through, spray, crimp, then drill in the crimp direction. Follow every herbicide label, including replant intervals for clover, peas, and brassicas you're drilling next.

What to plant after

- **A fall attraction plot.** The low-rye, pea-heavy Central WI Fall Blend from our free Central Wisconsin blends guide, drilled into the mat about August 5–15 on the Sands (6–8 weeks before Hancock's October 3 median first freeze). Up north, aim for late July to early August.
- **A rye-based winter cover** on droughty knobs where holding the sand matters more than drawing deer.
- **Nothing.** Let it stand until frost. Every species in the warm-season recipes dies at a freeze, and the dead mat protects the soil until you drill in spring.

> **Watch the nitrogen**
>
> A big sorghum-sudangrass mat is high in carbon. NRCS asks planners to weigh a cover's carbon-to-nitrogen ratio at termination, and UW–Madison notes mowing and light fall tillage reduce nitrogen tie-up for the next crop. The legumes in this mix help. If you're following with brassicas, plan their nitrogen from your soil test and UW–Madison Extension's A2809 guidelines rather than assuming the cover supplied it.

Fertility starts with a soil test

UW–Madison Extension notes that sandy fields commonly test below pH 6 and are often short on sulfur and potassium. Preferred pH ranges in NRCS Table 2: cowpea 5.5–6.5, buckwheat 5.0–7.0, sorghum-sudangrass 5.5–7.0, soybean 5.8–7.0, sunflower 5.7–8.1. Lime and fertilize to the soil test, not to a guess. On my own plots I used Antler Dirt and added potassium.

Planting checklist

- ☐ Soil test pulled, and lime or potash applied to the report
- ☐ Seed bought by component, inoculant on hand for the cowpeas, soybeans, and peas
- ☐ Drill calibrated, with large and small seeds in the right boxes
- ☐ Soil thermometer reading 60°F or warmer at 2 inches at 9 a.m. for several mornings
- ☐ Rain in the forecast
- ☐ Mow date marked for the sorghum-sudangrass at 3–4 feet (optional)
- ☐ Termination window marked; buckwheat checked for flowering
- ☐ Fall seed and herbicide (if used) lined up before you terminate
- ☐ Order set: spray the standing cover, drill within about 3 days, crimp behind the drill in the same direction

Sources

Rates, dates, and soil guidance come from the following. Check the current page or publication; recommendations are updated.

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• **Univ. of Arkansas Extension, Cover Crop Termination (roller-alone kill by species)** — https://www.uaex.uada.edu/farm-ranch/crops-commercial-horticulture/horticulture/3.%20Cover%20Crop%20Termination_online.pdf

• **GROW IWM (Penn State and partners), How to Integrate Herbicides with Roll-Crimping (2024)** — https://growiwm.org/wp-content/uploads/2024/10/3-How-to-Integrate-Herbicides-with-Roll-Crimping.pdf

• **UW–Madison (Erin Silva), roller-crimper system: plant into standing cover, then crimp** — https://ipcm.wisc.edu/blog/2017/06/video-using-the-roller-crimper-system-with-early-planted-emerged-soybean/

• **Kornecki et al., USDA-ARS (2009), roller/crimper + herbicide termination; hairpinning in fresh rolled residue** — https://www.ars.usda.gov/ARSUserFiles/60100500/csr/ResearchPubs/kornecki/kornecki_09c.pdf

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• **UW–Madison IPCM (M. Ruark with the Midwest Cover Crops Council), Summer Annual Cover Crop Considerations for Prevented Planting (2019)** — https://ipcm.wisc.edu/blog/2019/06/summer-annual-cover-crop-considerations-for-prevented-planting/

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• **UW–Madison Extension, The important role of soil texture on water** — https://cropsandsoils.extension.wisc.edu/articles/the-important-role-of-soil-texture-on-water/

• **UW–Madison Extension, Growing great pasture and forage in sandy soils** — https://cropsandsoils.extension.wisc.edu/articles/growing-great-pasture-and-forage-in-sandy-soils-can-it-be-done/

• **Planting Date and Biculture Affect Sunn Hemp Productivity in the Midwest, Sustainable Agriculture Research 8(2), Wisconsin trials 2014–2017** — https://doi.org/10.5539/sar.v8n2p26

• **SARE, Managing Cover Crops Profitably: Buckwheat; Sorghum-Sudangrass; Cowpeas; Berseem Clover** — https://www.sare.org/publications/managing-cover-crops-profitably/

• **Wisconet (UW–Madison mesonet), hourly 2-inch soil temperature, Hancock, Arlington, Rhinelander, Spooner, 2024–2026** — https://wisconet.wisc.edu/

• **NOAA NCEI 1991–2020 freeze normals via Seasonplot: Hancock Exp Farm, Arlington, Rhinelander, Spooner Ag Res Stn** — https://seasonplot.com/frost-dates/usc00473405/

Disclaimer

This guide is general educational information for Wisconsin landowners. It draws on University of Wisconsin–Madison Extension, USDA-NRCS Wisconsin, and other sources cited at the end, plus field experience managing no-till food plots in Central Wisconsin. It is not professional engineering, agronomic, legal, or pesticide advice for a specific property, and it is not a substitute for a current soil-test report or the product label. Always follow pesticide labels and check current county and state requirements.

Fertility soil testing for food plots (pH, lime, phosphorus, and potassium) is different from the soil and site evaluations used to design septic systems in Wisconsin, which are a regulated service. Wisconsin Dirt does not currently offer soil and site evaluations.

Seed, lime, and fertilizer rates in this guide are starting points. Use the recommendations on your soil-test report and the seeding rates on your seed tag. Wisconsin Dirt is an approved dealer for Thunder Ridge food plot seed and soil products; bagged products are available by local pickup in the Wautoma area, arranged ahead of time.

No one can honestly guarantee hunting success or a perfect stand. Plant ahead of rain, and adjust for your soil, deer pressure, and the year you are in. © 2026 Wisconsin Dirt. All rights reserved.