THE BIG PICTURE PRINCIPLES

1. **What you need to know is a lot to cover**
   - To learn all you need to know about cover crops takes more than passive webinar-watching.
   - Need to actively read, ask questions, and – above all – plant covers and watch them grow.

2. **Quality cover crop advice comes from planners, not robots**
   - Quality conservation agronomy planning is inherently difficult because it must be site- and grower-specific.
   - Old books and new “smart tools” can help, but neither are substitutes for thinking and thoughtful planners.

3. **Golden rule #1: Know what you don’t know (yes, this applies to you – even if you’re not so new!)**
   - The “pool” of cover crop technical details can get deep; know which end you’re jumping into.
   - If you’re out of your depth, you can still cross the pool – just ask for help.

4. **“Cover crop” has many meanings: Know which one you’re talking about**
   - Caution: Vague use of term “cover crop” without additional clarification should raise a red flag.
   - “Cover crop” often means different things to different people (technical vs. programs, NRCS vs. DCR, etc.).
   - Broadest technical definition: “A crop grown primarily, but not exclusively, to benefit the soil, the environment, or other crops in the rotation” *(a good starting point, but that might not be what the conversation is about).*

5. **Don’t confuse cover crop practice with covered soil principle**
   - The conservationist’s overall goal is not more cover crops, but more covered soil – ideally achieved by mimicking nature with continuous living biomass above ground and abundant roots below.
   - Multiple strategies can be used to reach that goal – annual cover cropping is just one of them.
   - Some harvested “money” crops – annuals & especially perennials – can fulfill many of same purposes as covers.
   - Therefore, absence of harvest is not necessarily the key to achieving some cover crop benefits.
   - And cover cropping is not necessarily the key to achieving overall goal of covered soil.

6. **Start with the end in mind: Know your purpose(s)**
   - Cover crops can fulfill multiple purposes – by my count: 1 general/long-term and 9 specific/short-term purposes.
   - A single species or mix can potentially fulfill many purposes, but can never fulfill all purposes equally well.
   - The more priority you put on a specific purpose, the more you need to focus on it in cover crop planning.

7. **Most cover crop benefits are biomass driven**
   - Most cover crop benefits increase as cover crop growth (aboveground, belowground, or both) increases.
   - The idea that starving plants make for deeper roots is illogical; vigorous growth more likely to maximize rooting.

8. **Manage covers like crops; ask “What’s the limiting factor?”**
   - For best results, apply the same purposeful mindset & attention to detail used when managing money crops.
   - Focus on “law of minimum”: Continually identify and then address the factor(s) most limiting to optimum yield.

9. **Do cover crops pay? It depends!**
   - A potentially tough sell: Definite up-front costs in return for future benefits that are both indirect and uncertain.
   - Whether covers pay depends on budget details, but also in a big way on return-on-investment (ROI) timeframes.

"... generally, the type of soil management that gives the greatest immediate return leads to a deterioration of soil productivity, whereas the type that provides the highest income over the period of a generation leads to the maintenance or improvement of productivity.”  - CHARLES KELLOGG, 1936
10. **Golden rule #2: Keep it simple (KISS)**
   - Cover cropping can be complex, but doesn’t need to be complicated – there’s an important difference.

11. **Golden rule #3: Start small – and don’t be afraid to fall**
   - Trying new things is crucial for progress, but usually involves higher risk of failure. The solution: Start small.

12. **Your best cover crop answer usually starts with “It depends”…**
   - What does it depend on? The cropping system context, grower’s goals/purposes, and needs of the land.
   - After starting with “it depends”, turn the question around and start asking about context, purposes, etc.

13. **Your first context question: “What’s the crop rotation?” Then sketch the answer!**
   - Cover crop planning is a form of crop rotation planning; start by sketching rotation, then ID the gaps.
   - Basic cover cropping is finding cover crops that fit into the existing gaps in rotation.
   - Advanced cover cropping is adjusting the existing gaps to better fit desired covers crops.

14. **Start with the end in mind: Visualize the field after cover crop termination**
   - Ask: “How do we want field to look when farmer pulls in to plant next crop? When does that need to happen?”
   - Work backwards from there to inform decisions from species selection through termination timing/method.

15. **Making sense of many choices, Part I: Know your seasonal niches & functional groups**
   - VA NRCS Cover Crop Planning Manual (CCPM) is your guide to this categorization approach.
   - Six seasonal niches, starting with most traditional: Fall-seeded Winter Hardy (Niche 1).
   - Three core functional groups: Grass; legume; broadleaf non-legume (brassicas & forbs).

16. **Making sense of many choices, Part II: Know your planting windows & species characteristics**
   - Seasonal niche is only a start on knowing whether a cover crop fits – must refine with species-specific dates.
   - VA NRCS Cover Crop Planting Calendar Excel tool (draft available here) helps visualize planting windows.
   - You also must get to know the species; short descriptions in VA NRCS CCPPM are just a starting point.

17. **Making sense of many choices, Part III: Mixes are not magic, just another useful tool**
   - Mixes allow you to fulfill more purposes with a single planting, but every mix is a compromise.
   - Diverse mixes are not a silver bullet fix for anything, including a low-diversity money crop lineup.
   - Focus on purpose and proper planning first. But wherever they fit, make simple mixes your default option.

18. **Success starts at seeding: Well sown is half grown**
   - The 3 “Rs” of successful seeding: Right seed, right temperature, right moisture.
   - Right seed: Proper quantity (seeding rate in lb/acre) & quality (germination rate in %) needed!
   - Right temperature: Both at seeding and after. This is why we have recommend seeding dates!
   - Right moisture: Especially at seeding. This is why seed-to-soil contact is a foundational agronomy principle!

19. **Remember: Manage covers like crops & keep the end in mind!**
   - Keep asking: “What factors under our control are likely limiting performance of the cover crop?”
   - Keep asking: “What factors under our control are likely to limit performance of the crop that will follow?”

20. **Since it is usually biomass driven, cover crop performance can be quantified**
   - The simple way: Estimate or measure % of theoretical raindrops intercepted by cover crop tissue.
   - The best way: Estimate or measure pounds per acre of cover crop biomass (on dry matter basis).
   - The toughest question: Establishing up front the performance target you’re aiming to hit!