Opportunities to Maximize Weed Management

1. **Ask this question first: Were weeds present at harvest last year in any of your fields?**
   A. Suspect most plants of **kochia, waterhemp, wild oat, common ragweed, and green foxtail** present at harvest to be resistant to the herbicides applied, particularly herbicides in Groups 1, 2, 4, 5, 9, 14, and 27. Acknowledging the presence of resistant weeds in a field is critical to maximizing weed management.

2. **Choose the right herbicide PROGRAM, NOT just a single herbicide or single herbicide application.**
   A. PRE followed by POST herbicide program whenever possible.
   B. Choose the most effective herbicides based on resistant weed types in the field.
   C. Apply multiple herbicide sites of action in each application where possible.
   D. PRE herbicides almost always provide some weed control even with reduced rainfall.
   E. **Any reduction** in weed density from PRE herbicides almost always improves POST herbicide activity.
   F. Apply residual herbicides in first POST application to control late emerging weeds where possible.

3. **Apply maximum recommended herbicide rates, NOT minimum rates where possible.**
   A. Consider soil types, organic matter, and/or pH for proper rates of soil-applied herbicides.
   B. Consider crop growth stage and environmental factors when choosing herbicide rates and adjuvants, especially for minor crops.
   C. Evaluate pre-mixture herbicides making sure most effective active ingredient rates are applied.

4. **Apply ALL POST/Burndown herbicides when ANNUAL weeds are less than 3 inches in height.**

5. **If weeds are present in no-tillage fields, in most cases, apply burndown herbicides preplant, NOT after planting.**
   A. Must start with a weed-free seedbed prior to planting or at least prior to crop emergence.
   B. Apply herbicides in the fall to control winter annual, biennial, and perennial weeds and obtain some early-season control of certain annual weeds (i.e. kochia, horseweed, wild oat) in no-tillage fields.

6. **Apply herbicides using the proper spray volume.**
   A. Apply 20 GPA spray volume for ALL contact herbicides, especially glufosinate and paraquat.
   B. Always follow label directions for spray volume.
   C. Increase spray volume when increasing droplet size, even for translocating herbicides.
   D. Greater weed densities and/or taller weeds **require** a greater spray volume.

7. **Scout every field before and after each herbicide application.**
   A. This includes burndown and PRE herbicide applications.
   B. Scout 5 to 10 days after each herbicide application.

8. **Medium to coarse spray droplets usually provide the most consistently effective weed control.**
   A. Must follow ALL label directions for nozzle type AND spray droplet size.

9. **Use PROPER adjuvants AND rates as recommended by herbicide label.**
   A. Use full recommended rates of spray grade AMS for glyphosate and glufosinate.
   B. AMS replacements are usually less effective for glyphosate and glufosinate and some other herbicides.
   C. **Not all** adjuvants are created **equal**. Use the best adjuvant, not the cheapest adjuvant.

10. **Sprayer travel speed**
    A. Slower travels speeds (<8 mph) are critical for tall weeds, dense weed populations, field borders and contact herbicides.

11. **IF a second POST herbicide application is necessary, apply 14 days after the first application.**

12. **Water source and temperature (cold most detrimental).**
    A. Hard water ions tie up herbicides, particularly glyphosate and glufosinate, but others as well.
    B. Soil particles in water tie up glyphosate and paraquat.

13. **Vertical tillage almost never controls ALL weedy plants NOR properly incorporate PRE herbicides.**
    A. Weeds surviving tillage are more difficult to control with POST herbicides.

14. **Sprayer operation.**
    A. Maintain proper boom height. In most cases 20 to 25 inches above target. Nozzle angle impacts height.
    B. Check sprayer calibration frequently. Don't just look at total spray volume applied.
    C. Check each nozzle multiple times during the growing season and replace worn nozzles.
    D. ONLY use nozzles designed for use with Pulse Width Modulation (PWM) sprayers.

15. **Apply POST herbicides at Delta-T values between 3.6 and 14.4 and please do not apply at greater than 18.**
    A. Delta-T values are based upon humidity AND temperature.
    B. Delta-T values change throughout the day! Check before spraying the next field.

16. **Apply herbicides at proper time of day, especially glufosinate, glyphosate, and paraquat.**

17. **Mix herbicides in the proper order according to herbicide label(s) to improve weed control or use the A.P.P.L.E.S. method in the ND Weed Control Guide (page 86).**
    A. Fill clean spray tank at least half-full with water before adding any products.
    B. Begin agitation and continue until spray solution has all been sprayed out.

18. **Please remove all surviving plants in fields before seed production begins and/or prior to grain harvest.**
    A. Combines quickly and easily spread weed seeds farther into a field and into other fields.
    B. Weed seeds spread by water, wind, animals, equipment, and humans.

19. **Manage weeds in each field, not the entire farm.**

20. **Plant a greater diversity of crops in the crop rotation.**

21. **Use all possible methods of weed control, not just herbicides alone.**
    A. Cultural practices are critical to improving weed control. Goal is quick crop canopy closure.
    B. Use mechanical, robotic, weed seed destructor, and other weed control methods.

22. **Practice field margin weed management since greater weed density is usually near field borders.**
    A. Outside field margin: Mow weeds before seed production and as often as necessary.
    B. Inside field margin: May need an additional herbicide application or row-cultivate and/or pull weeds.

23. **Quote: "It's the little details that are vital. Little things make big things happen," (John Wooden)**

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