



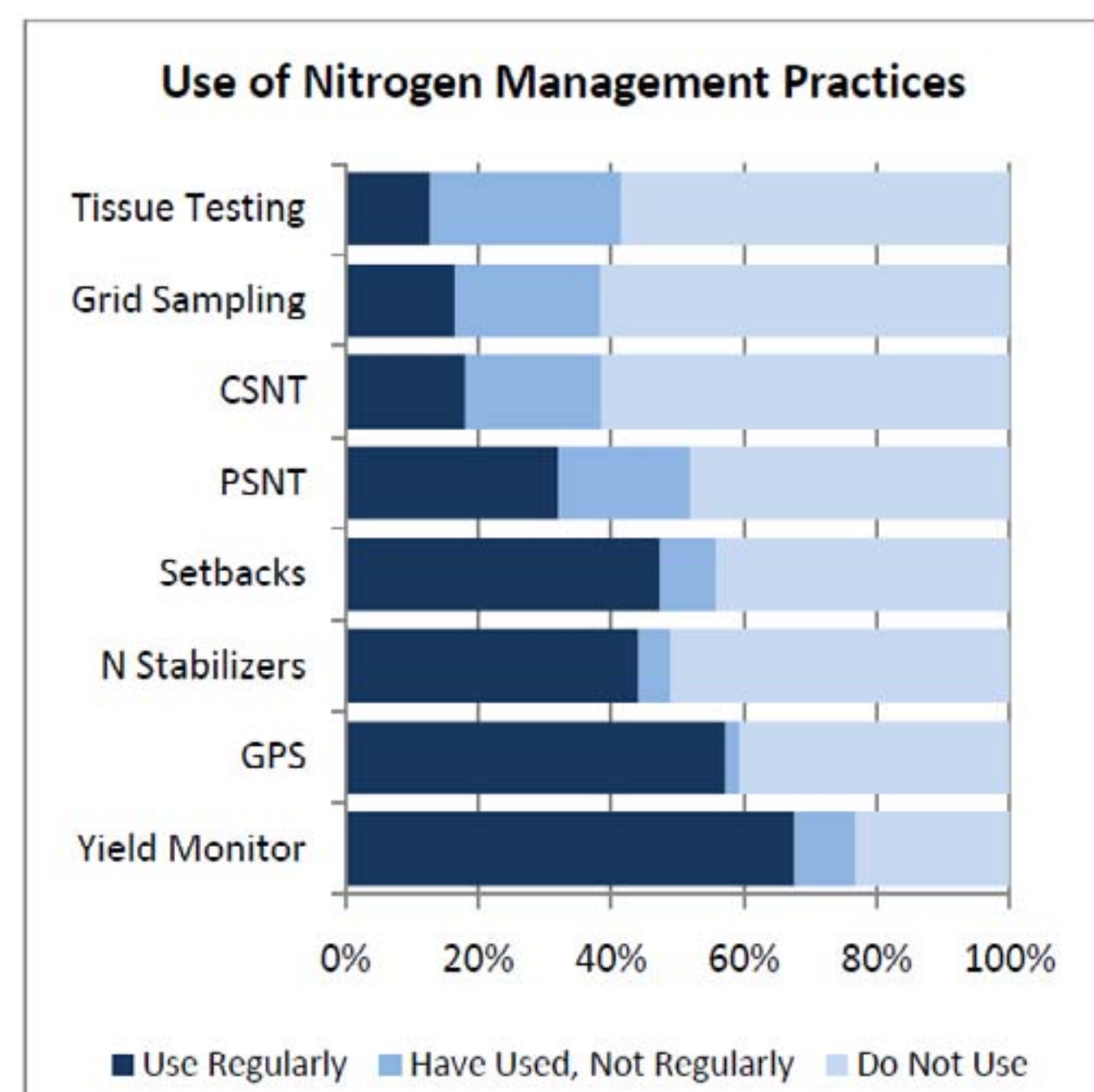
A 4R Nutrient Stewardship Plan in Action



Opportunities for Increased Adoption of 4R

4Rs in Upper Chester River Watershed, Maryland

- USDA-led effort targeting resources to increase conservation adoption by seeking to reach 100 percent of residents in the watershed.
- Maryland Department of Agriculture provided funds to perform a farm assessment in the watershed; 87 percent of the agricultural land is represented in the results.
- The survey captures the current implementation of 4Rs nutrient use efficiency management tools.

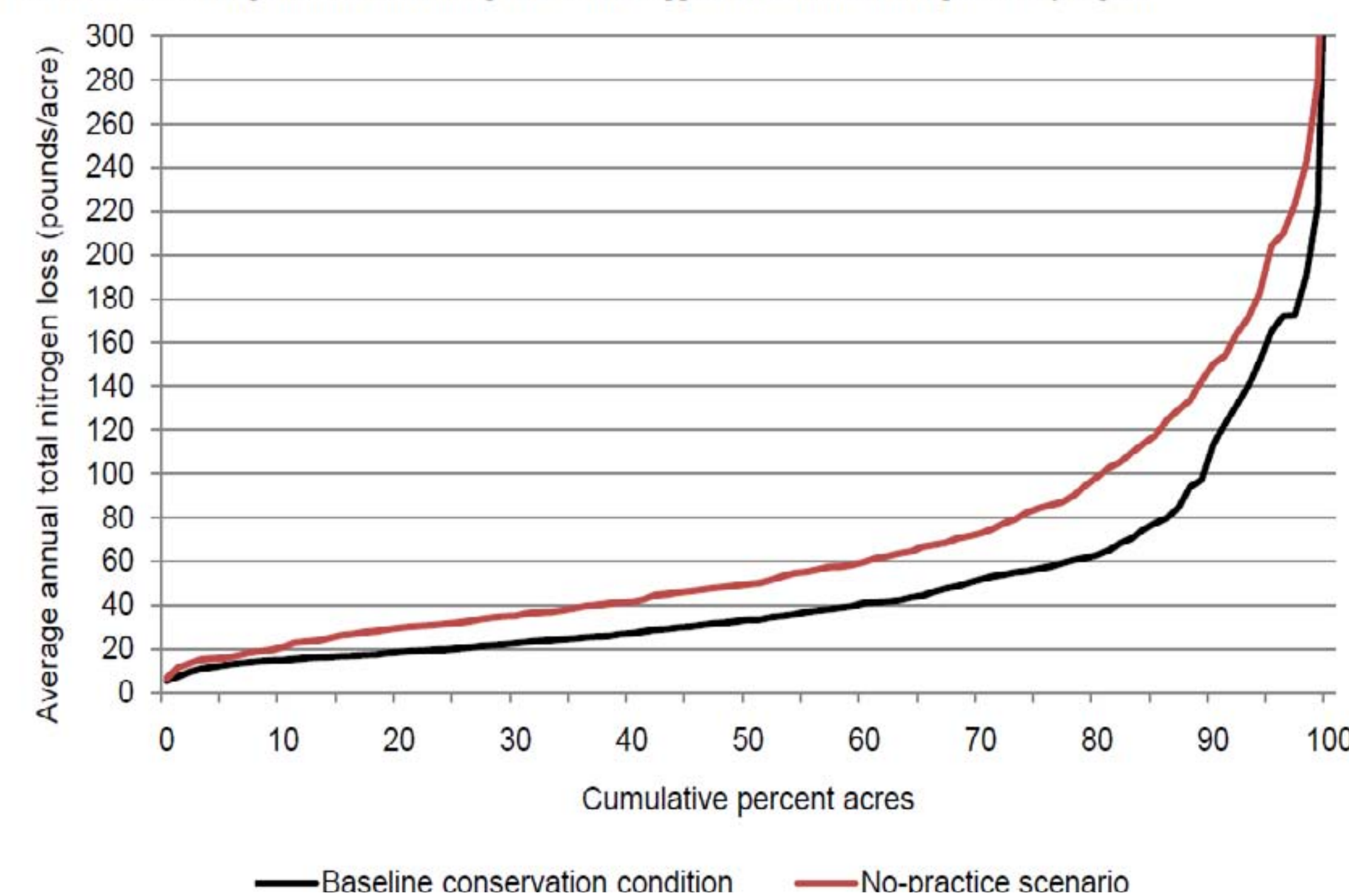


This table shows common N management practices and their common use among farmers in the watershed. Most farms (56 percent) use at least two of these practices; 25 percent of the farms use four or more of these practices regularly. *Source – Upper Chester River Showcase Watershed Project Farm Assessment Report.*

Opportunity for Increased 4Rs Adoption – NRCS CEAP

- Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Chesapeake Bay Region (USDA NRCS, February 2011)
- Report indicates – “The greatest conservation need in the region is complete and consistent use of nutrient management—appropriate rate, form, timing, and method of application.”

Figure 33. Estimates of average annual total nitrogen loss for cropped acres in the Chesapeake Bay region



Acres with the highest nitrogen losses have the highest inherent vulnerability combined with inadequate nutrient management and runoff controls. About 59 percent of cropped acres lose less than 40 lbs/ac/yr, while 10 percent lose more than 100 lbs/ac/yr. *Source – USDA NRCS Chesapeake Bay CEAP Report.*

Pathways for 4R Implementation

Targeting 4Rs for Water Quality Improvements

- A report from the Harry Hughes Center for Agro-Ecology (2008) indicated that both geographically and programmatically targeted funding is necessary.
- Geographic locations should be identified (based on soil type, slope, distance to streams, cropping systems, et al.) that contribute the greatest nitrogen, phosphorus, and sediment loads; then suites of practices should be strategically implemented to maximize reductions.
- MD NRCS, with their Partners:
 - Identify the highest agriculturally impaired watershed segments with greatest nutrient/sediment loads to the tidal Chesapeake Bay;
 - Identify farms with the highest potential of resource impact and eligibility for Farm Bill funding to implement priority nutrient/sediment-reducing practices;
 - Work with Partners to outreach and provide technical assistance to these individual producers to implement cost-effective practices that are most effective at reducing nutrients and/or sediment. (Nutrient Subcommittee, MD NRCS State Technical Committee, June 19, 2009)

Maryland NRCS Offer a Tiered 590 Nutrient Management Standard

Soil/Tissue Sampling

- Precision soil sampling or “smart sampling”
- Tissue Testing
- Soil N (Nitrate) Test
- Chlorophyll Meter Test
- PSNT if manure is used or field has high organic soils

Nutrient Application Timing

- Injection of side dress application of nitrogen on Corn
- Band Applications of Phosphorus
- Split Applications of Nitrogen – Small grain

Forms of Nitrogen Applied

- Utilize Slow or Controlled Release Nitrogen
- Use of Urease Inhibitor

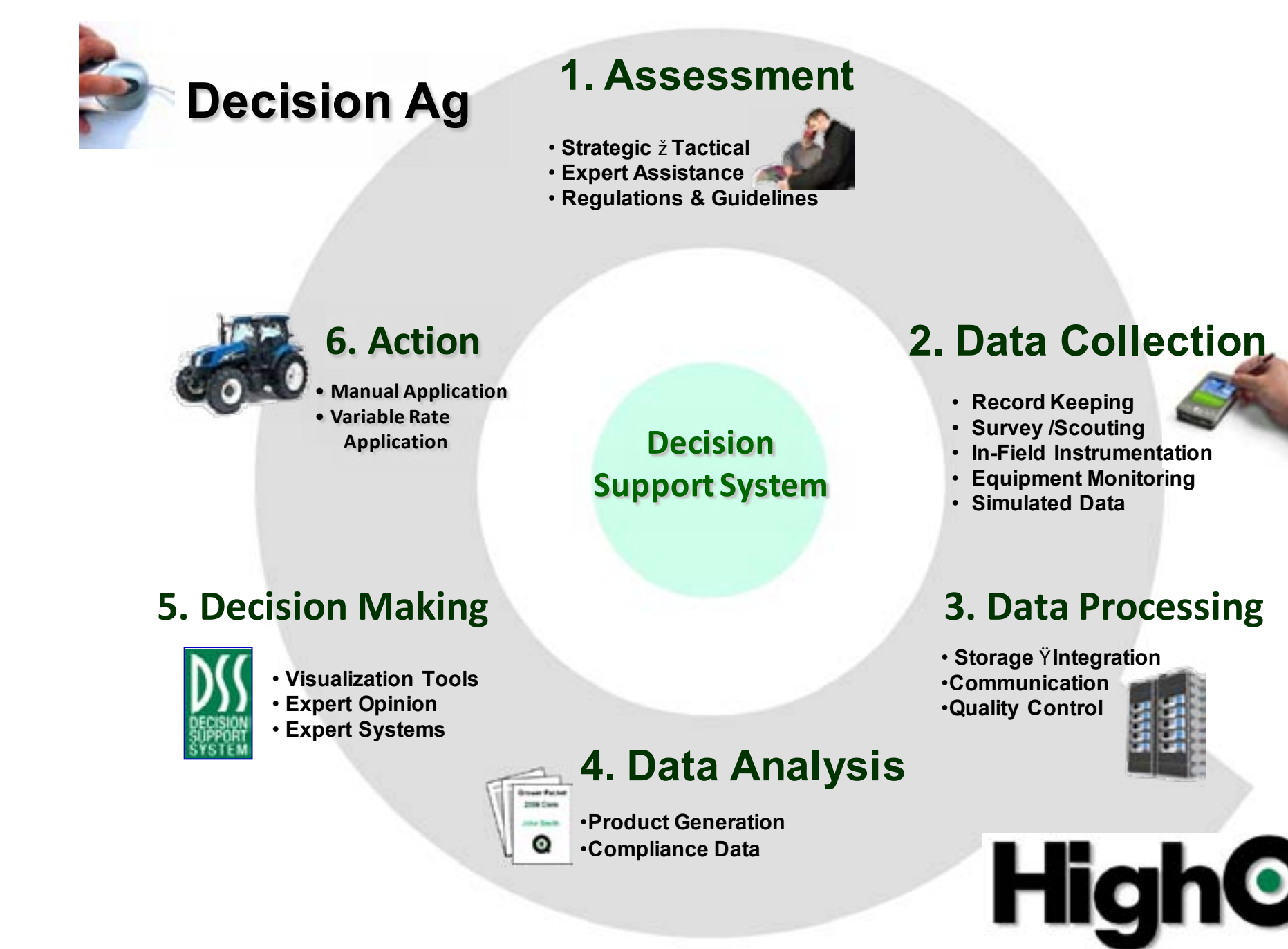
Enhanced Nutrient Management – Decision Agriculture

Producer provided documentation of implementing Decision Agriculture nutrient management system techniques which include: management tool maps (yield maps, planting maps, bar charts) crop productivity charts and field input data (application of nutrients, pesticides, irrigation, crop records).

4R Implementation

Decision Support System for 4Rs

- MD NRCS defined “Enhanced Nutrient Management - Decision Support System” – utilize a GPS and yield monitoring system to collect field-specific crop data, and a software/record keeping system that analyzes that data. Utilize this analysis to adjust field inputs, which may include variable rate fertilizer, lime, and/or variable rate planting.
- Involves the development and use of an extensive record keeping system of crop management and yield data inputs using GPS technology to ensure the most efficient production is achieved.
- HighQ™ Decision Support System offered by Willard Agri-Service to farmers in PA, MD, VA and DE meets this NRCS definition. The HighQ™ system equals:



Other retailers and agronomists offer programs with similar characteristics and services in other regions of the country. Retail associations and agronomic services can provide the level of detail and services necessary to implement the 4Rs/Enhanced Nutrient Management systems on the farm.

