

Putting it all together

Assembling and Delivering a Nutrient Management Plan

Fundamentals of Nutrient Management 2023

Kayla Griffith

UNIVERSITY OF
MARYLAND
EXTENSION

**FEARLESSLY
FORWARD**



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mail:
U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;

fax:
(833) 256-1665 or (202) 690-7442; or

email:
program.intake@usda.gov.

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correo postal:
U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;

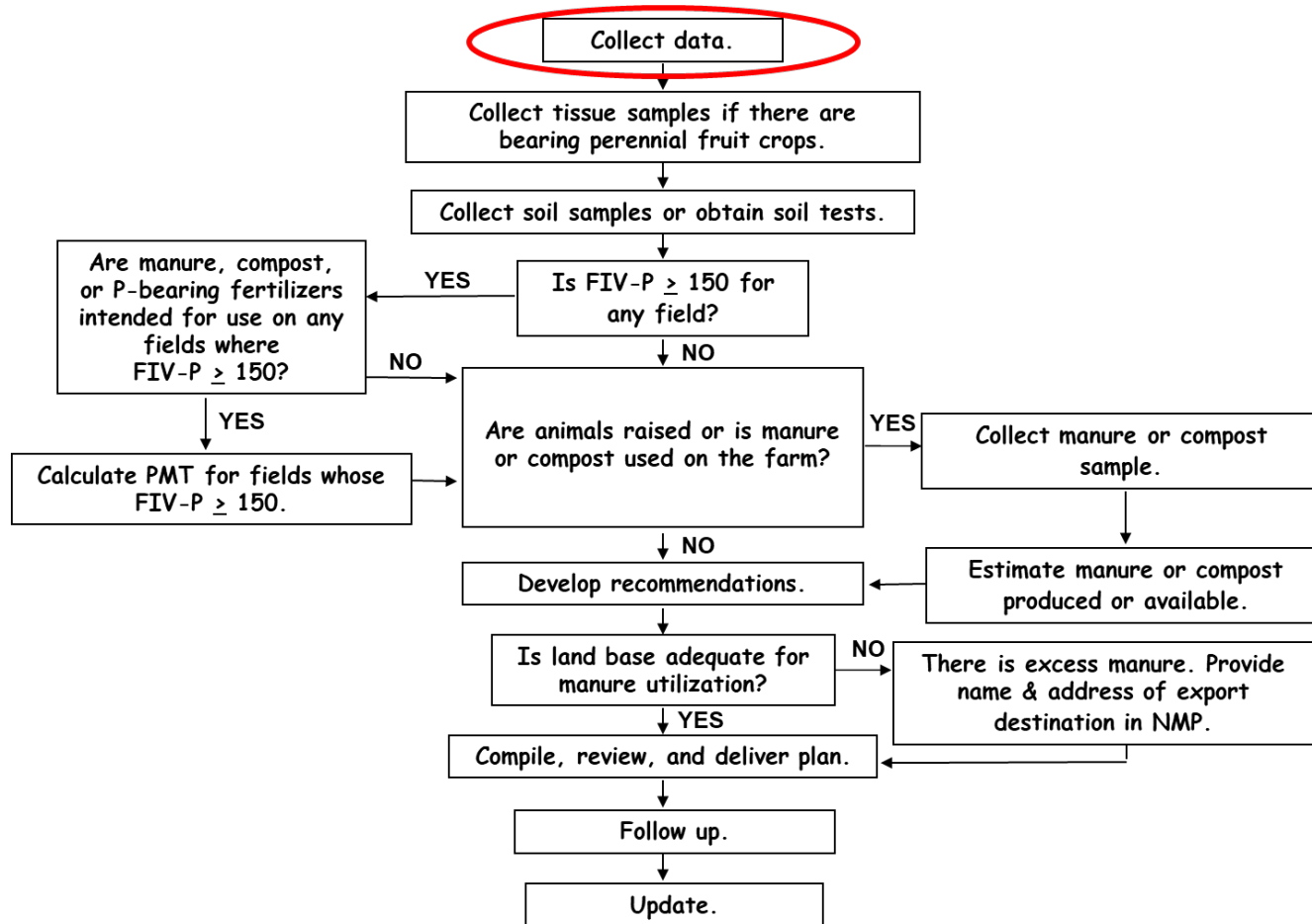
fax:
(833) 256-1665 o (202) 690-7442; o

correo electrónico:
program.intake@usda.gov.

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The Nutrient Management Planning Process



Data Collection

Property information

- farmer's name
- farm address/ mailing address
- County
- Watershed
- acres farmed
- streams adjacent to fields and pastures



Data Collection (continued):

Account ID numbers

➤ tax bill or assessment

➤ tax office

➤ Real Property Search

○ Street address

○ Owner's name

➤ MDP Finder Online

○ Maryland Department of Planning



Farm Data Collection Sheet

Operator Name:				Date ____/____/____		
Operator Address:				Plan period ____/____ to ____/____		
				New plan _____ Plan update _____		
Home Phone:		Work Phone:		Maps		
Cell Phone:		Barn Phone:		Best time/method to contact:		
E-mail:						
Tract #	Farm Name	Tax Account ID #	Stream Present? (Y/N)	Acres Farmed (cropland & pasture)	Landowner's Name	Street Address of Land
Plan or program participation:						
____ Soil conservation plan		____ CRP/CREP (indicate on maps)		____ Cover Crop cost-share		
____ EQIP Nutrient Use Efficiency		____ MACS cost-share		____ Other (specify) _____		



Resources for data collection are available on our website:

extension.umd.edu/anmp

Under “Plan Writing Tools”

<https://go.umd.edu/plan-writing-tools>

What is Involved in the Plan Writing Process?

The **plan writing process** involves the following steps:

- ➔ **1. Data Collection** ▼
- 2. Soil Sampling and Testing** ▼
- 3. Manure (and Other Organic Source) Sampling and Testing** ▼
- 4. Manure/Organic Quantity Estimation and Utilization** ▼
- 5. Tissue Sampling and Testing** ▼
- 6. University of MD Phosphorus Management Tool (UM-PMT)** ▼
- 7. Generating Recommendations** ▼
- 8. Compiling and Reviewing Your Nutrient Management Plan** ▼



The [plan writing process](#) involves the following steps:

1. Data Collection

Step 1. Data Collection

Collecting and carefully organizing information (data collection) from the field site along with the producer interview is the first step in developing a nutrient management plan.

The following worksheets and information sheets will assist you with the data collection step of nutrient management plan development.

Data Collection Sheets (fillable pdfs)

- [Farm Data Collection Sheet](#) (DC-1; 09/2020)
- [Field Data Collection Sheet](#) (DC-2; 08/2020)
- [Poultry Production and Litter Data Collection Sheet](#) (DC-3; 08/2020)
- [Animal Production and Manure Data Collection Sheet](#) (DC-4; 08/2020)

Data Collection Calculation Worksheets (excel file)

- [Fertilizer already applied](#) (use when some nutrients have been applied prior to plan development, posted 04/2018)

Finding Tax Account ID Numbers

- [Using Maryland's Real Property Search \(SDAT\)](#) (04/2017)
- [Finding Tax Account ID Numbers via Finder Online](#) (8/2018)



https://sdat.dat.maryland.gov/RealProperty/Pages/default.aspx

The screenshot shows the SDAT website interface. At the top, there is a navigation bar with links for "Maryland.gov", "Phone Directory", "State Agencies", and "Online Services". Below this is a banner for the "DEPARTMENT OF ASSESSMENTS & TAXATION" featuring the Maryland state flag and social media icons for Facebook and Twitter. A dark navigation menu contains links for "HOME", "ABOUT", "REAL PROPERTY", "BUSINESSES", "FORMS & APPLICATIONS", "STATS & REPORTS", and "SERVICES".

The main content area has a teal header with "Real Property Data Search" and a link to a "Guide to searching the database". Below this, a disclaimer states: "THE TERMS OF USE for the SDAT website prohibit any form of automatic or robotic data collection, extraction or copying, such as data mining or web scraping. Violation of any Term of Use immediately terminates the user's license or permission to access and/or use SDAT's website. See full statement of the TERMS OF USE at <http://dat.maryland.gov/about/Pages/Website-Usage-Statements.aspx>."

A note follows: "If you experience difficulties using this system try either Internet Explorer, Chrome or Firefox to complete a successful data search."

The search form contains two dropdown menus:

- "Select the county in which to search:" with a dropdown menu showing "-Select one-".
- "Select the search method to proceed:" with a dropdown menu showing "-Select one-".

A blue "Continue" button with a right-pointing arrow is located at the bottom right of the form area.





Search

Email

- HOME
- ABOUT SDAT
- BUSINESSES
- REAL PROPERTY
- TAX & ASSESSMENTS
- FORMS & APPLICATIONS
- SDAT/STATS
- SERVICES

Real Property Data Search (w3)

Search Help

Your feedback is important to us. Please take our short survey.

1

Select the Search Method

2

Enter Search Parameters

3

Results

Search Result for WASHINGTON COUNTY

New Search

[View Map](#)

[View GroundRent Redemption](#)

[View GroundRent Registration](#)

Account Identifier:

District - 12 Account Number - 014201

Owner Information

Owner Name:

MD UNIVERSITY

Use:

EXEMPT COMMERCIAL

Principal Residence:

NO

Mailing Address:

C/O WESTERN MD RESEARCH&ED CTR
18330 KEEDYSVILLE RD
KEEDYSVILLE MD 21756-1104

Deed Reference:

1) /00640/ 00788
2)

Location & Structure Information

Premises Address:

18330 KEEDYSVILLE RD
KEEDYSVILLE 21756-0000

Legal Description:

546AC FT RITCHIE BS
18330 KEEDYSVILLE RD &
7313 SHARPSBURG PIKE

Map:	Grid:	Parcel:	Sub District:	Subdivision:	Section:	Block:	Lot:	Assessment Year:	Plat No:
0072	0003	0021		0000				2012	Plat Ref:



County Codes for Account IDs

County	County Code
Allegany	01
Anne Arundel	02
Baltimore City	03
Baltimore	04
Calvert	05
Caroline	06
Carroll	07
Cecil	08
Charles	09
Dorchester	10
Frederick	11
Garrett	12

County	County Code
Harford	13
Howard	14
Kent	15
Montgomery	16
Prince George's	17
Queen Anne's	18
St. Mary's	19
Somerset	20
Talbot	21
Washington	22
Wicomico	23
Worcester	24



Data Collection Continued

Farm map

- road name
- property boundaries
- field boundaries
- field names or numbers
- field acreage
- streams within or adjacent to fields or pastures



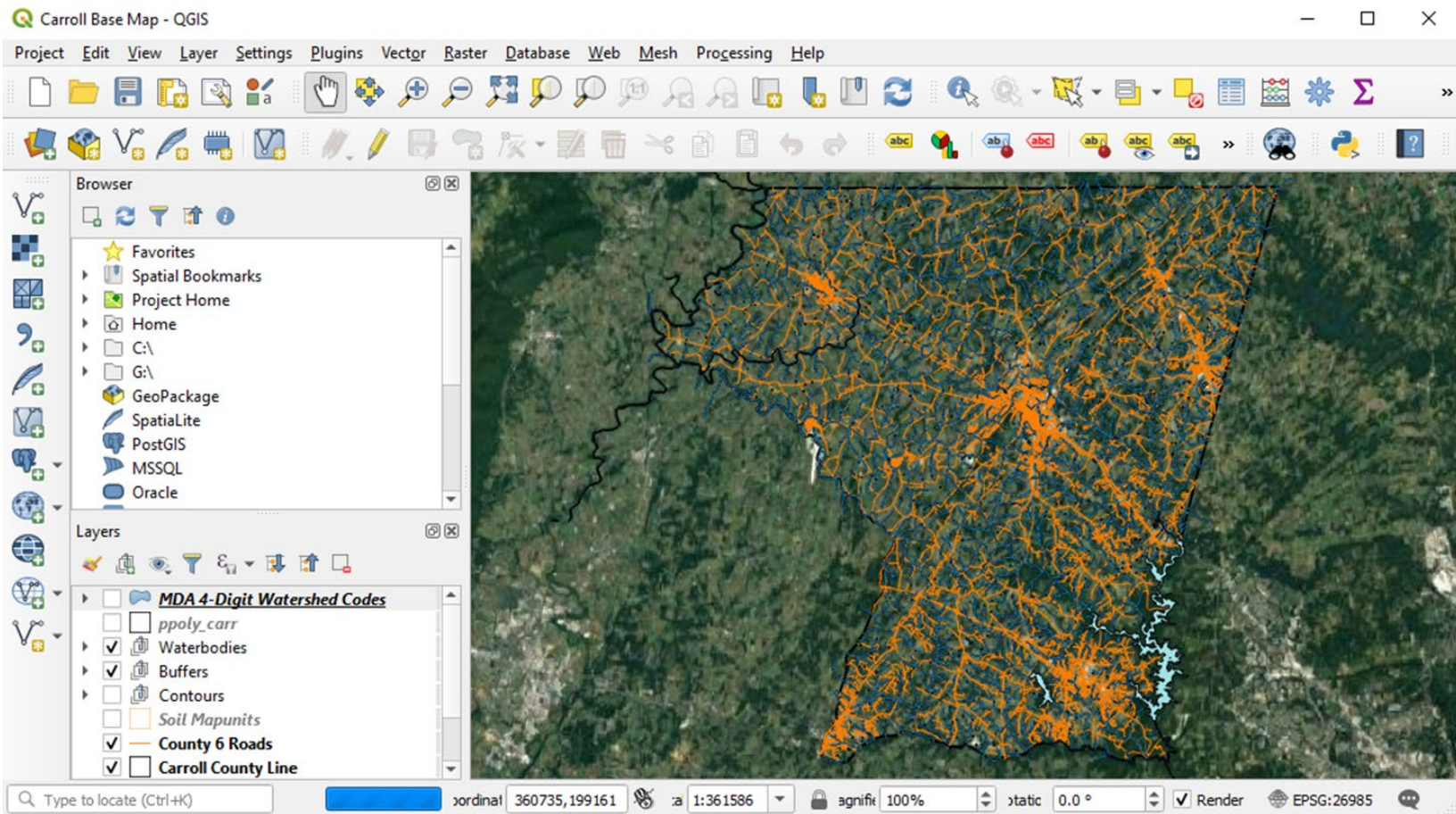
Photo credit: Edwin Remsberg

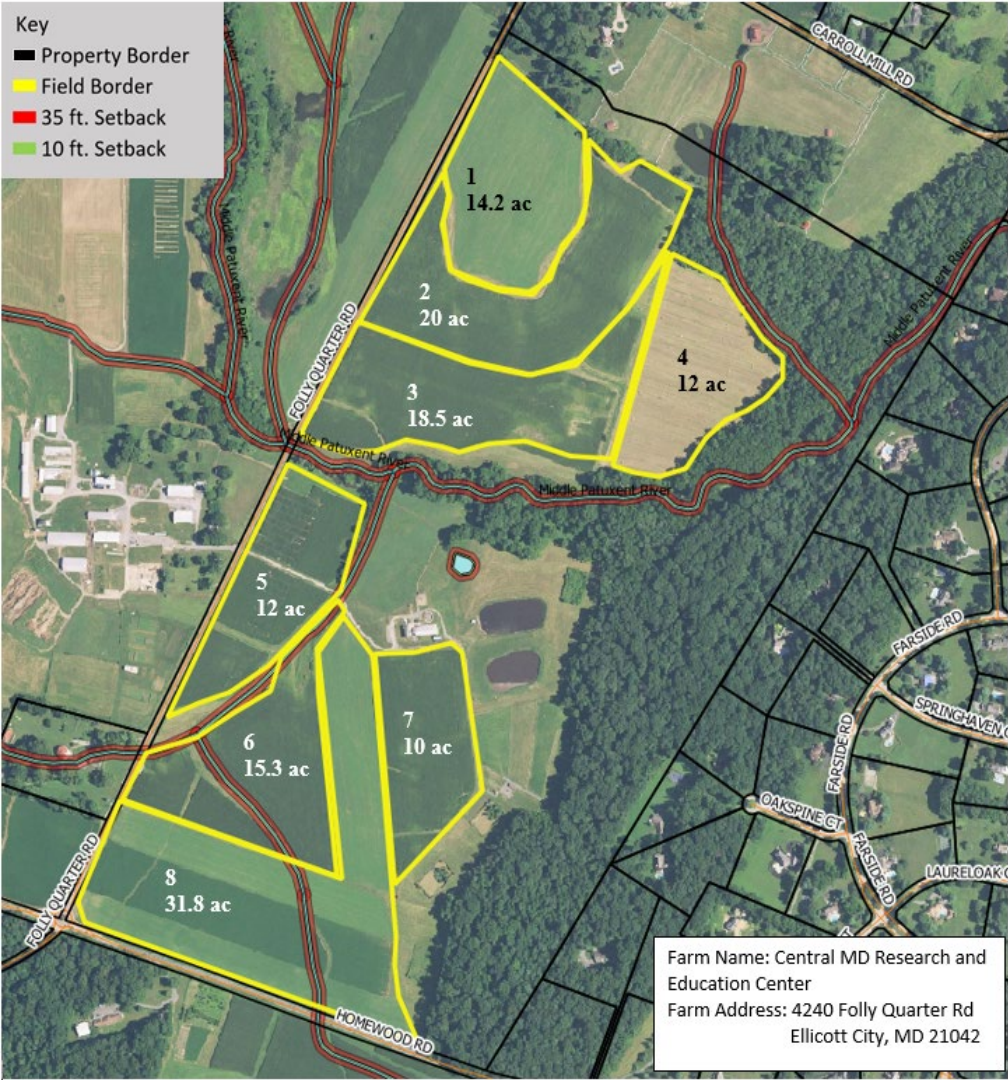


Data Collection (continued)

- Map sources
 - Google Earth
 - a GIS-based program
 - QGIS data layers and directions on website
 - software tab
 - hand drawn and FSA are passé
 - need setbacks accurately shown on map







- An example of a well-made map
- Will often add tax ID
- Make as clear and simple as possible



Data Collection (for each field)

- crops to be planted
- yield goals
 - farmer's records or Web Soil Survey (WSS)
- cropping history – were any legumes grown last year or over-winter?
- organic sources applied in last 2 years?
- type of application equipment & incorporation
- stream within or adjacent to any field or pasture?



Building Site Development ?

Construction Materials ?

Disaster Recovery Planning ?

Land Classifications ?

Land Management ?

Military Operations ?

Recreational Development ?

Sanitary Facilities ?

Vegetative Productivity ?

Crop Productivity Index

Forest Productivity (Cubic Feet per Acre per Year)

Forest Productivity (Tree Site Index)

Iowa Corn Suitability Rating

Range Production (Favorable Year)

Range Production (Normal Year)

Range Production (Unfavorable Year)

Yields of Irrigated Crops (Component)

Yields of Irrigated Crops (Map Unit)

Yields of Non-Irrigated Crops (Component)

View Description View Rating

View Options ?

Map

Table

Description of Rating

Rating Options

Detailed Description

Basic Options ?

Crop Bu

Advanced Options ?



Warning: Soil Ratings Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:12,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

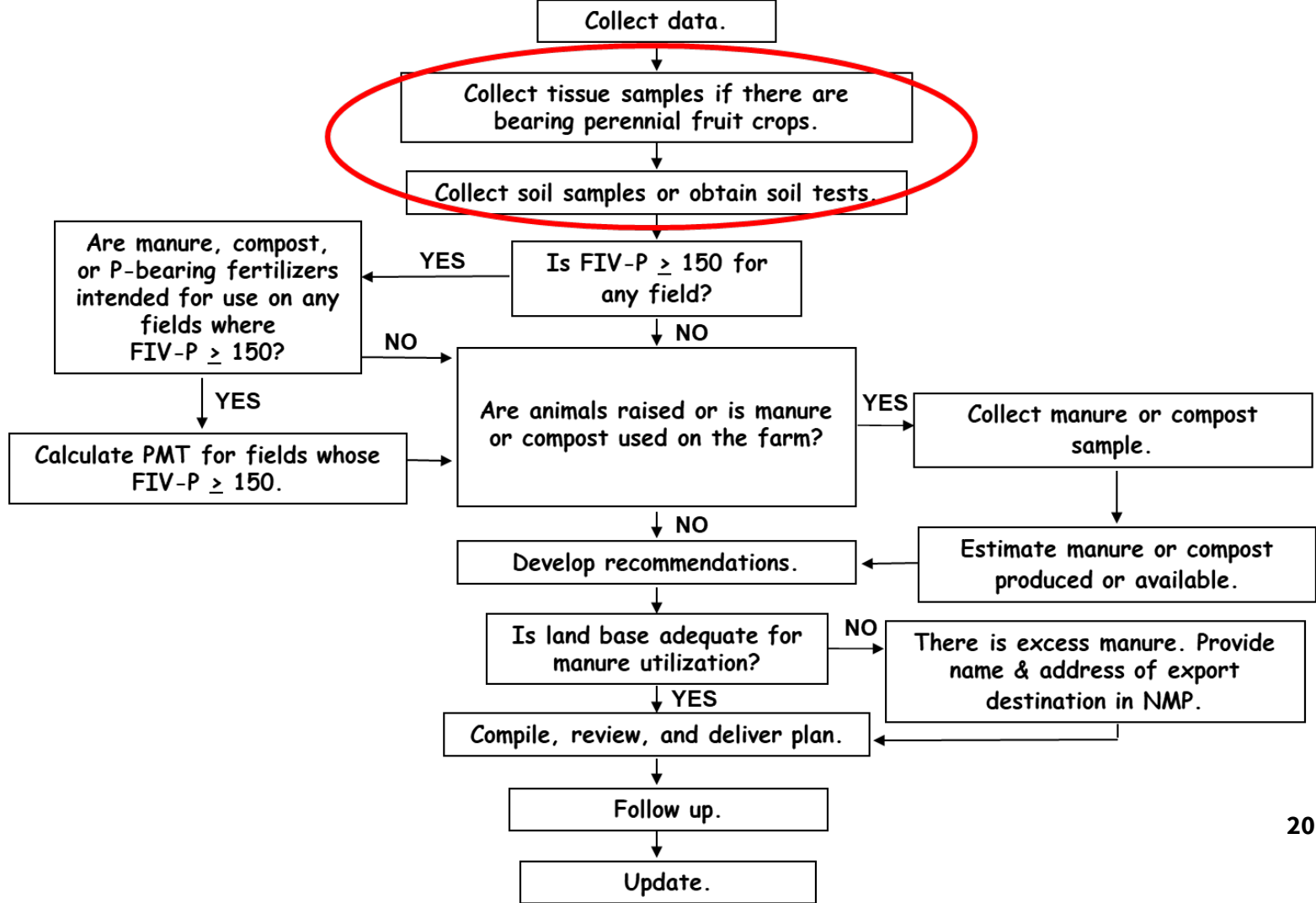
Tables — Yields of Non-Irrigated Crops (Component): Corn (Bu) — Summary By Map Unit

Summary by Map Unit — Washington County, Maryland (MD043)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HaB	Hagerstown silt loam, 3 to 8 percent slopes	143.60	1.5	58.2%
SsA	Swanpond-Funkstown silt loams, 0 to 3 percent slopes	129.00	1.1	41.8%
Totals for Area of Interest			2.5	100.0%

Finding Yield Goals in WSS

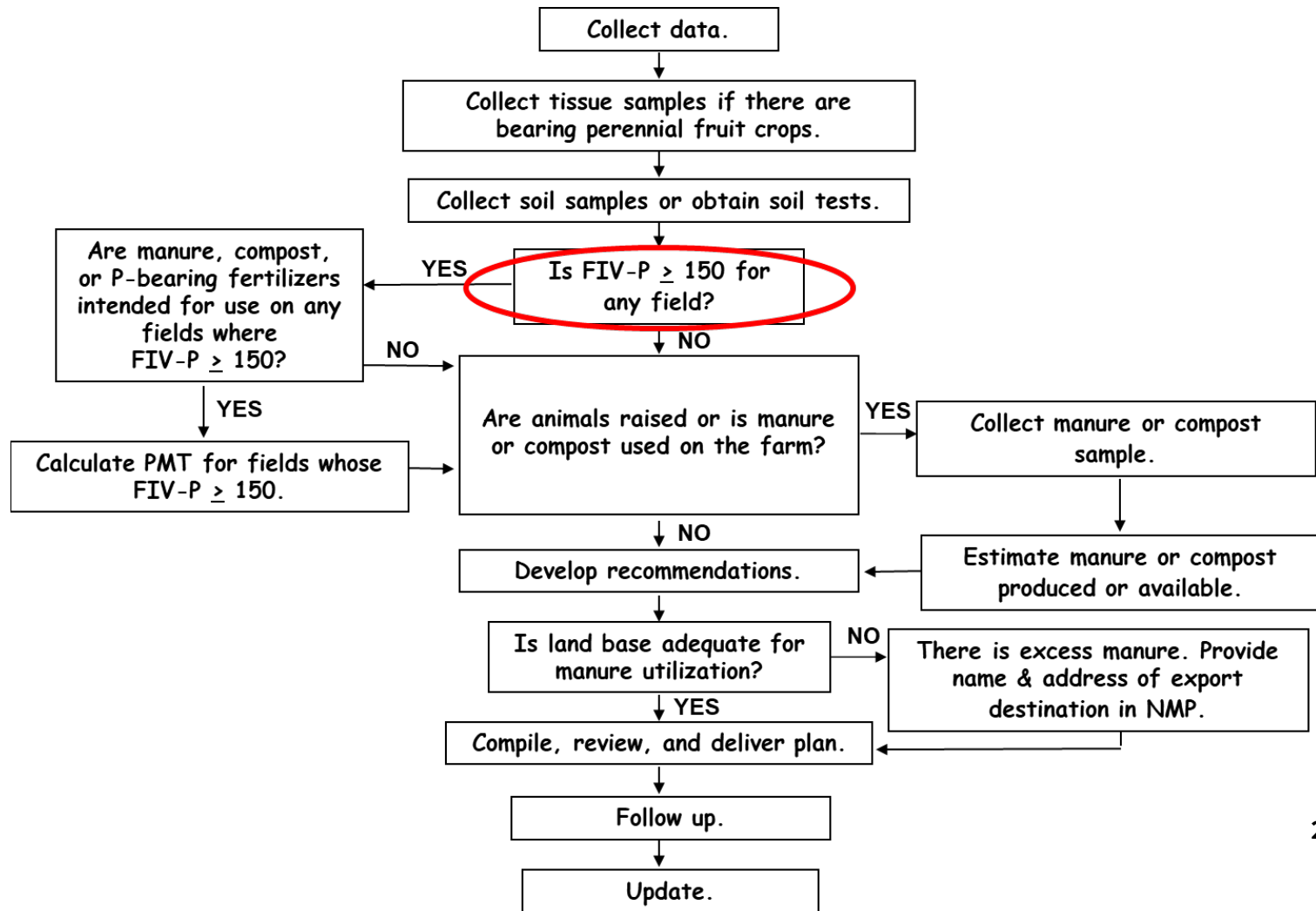




Collecting Samples

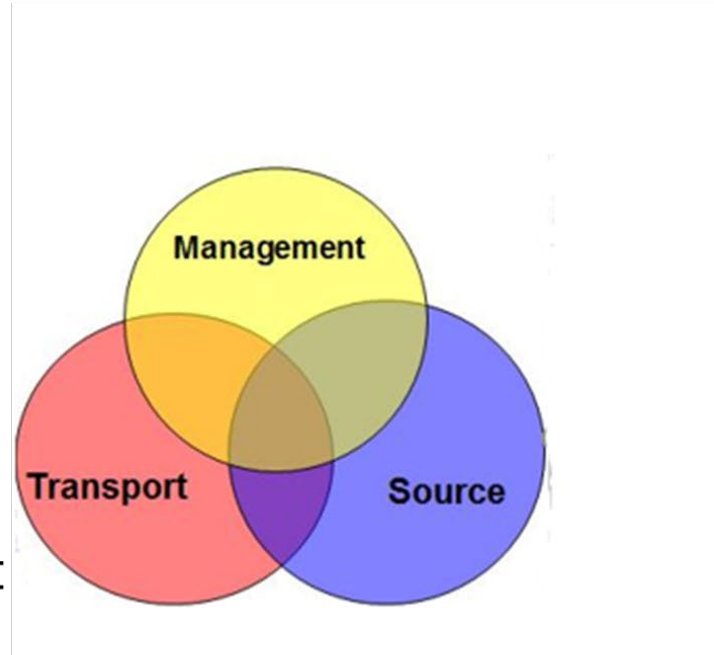
- Collect soil samples from all fields (including pastures)
- Collect tissue samples for perennial fruits
- Samples are valid for _____?

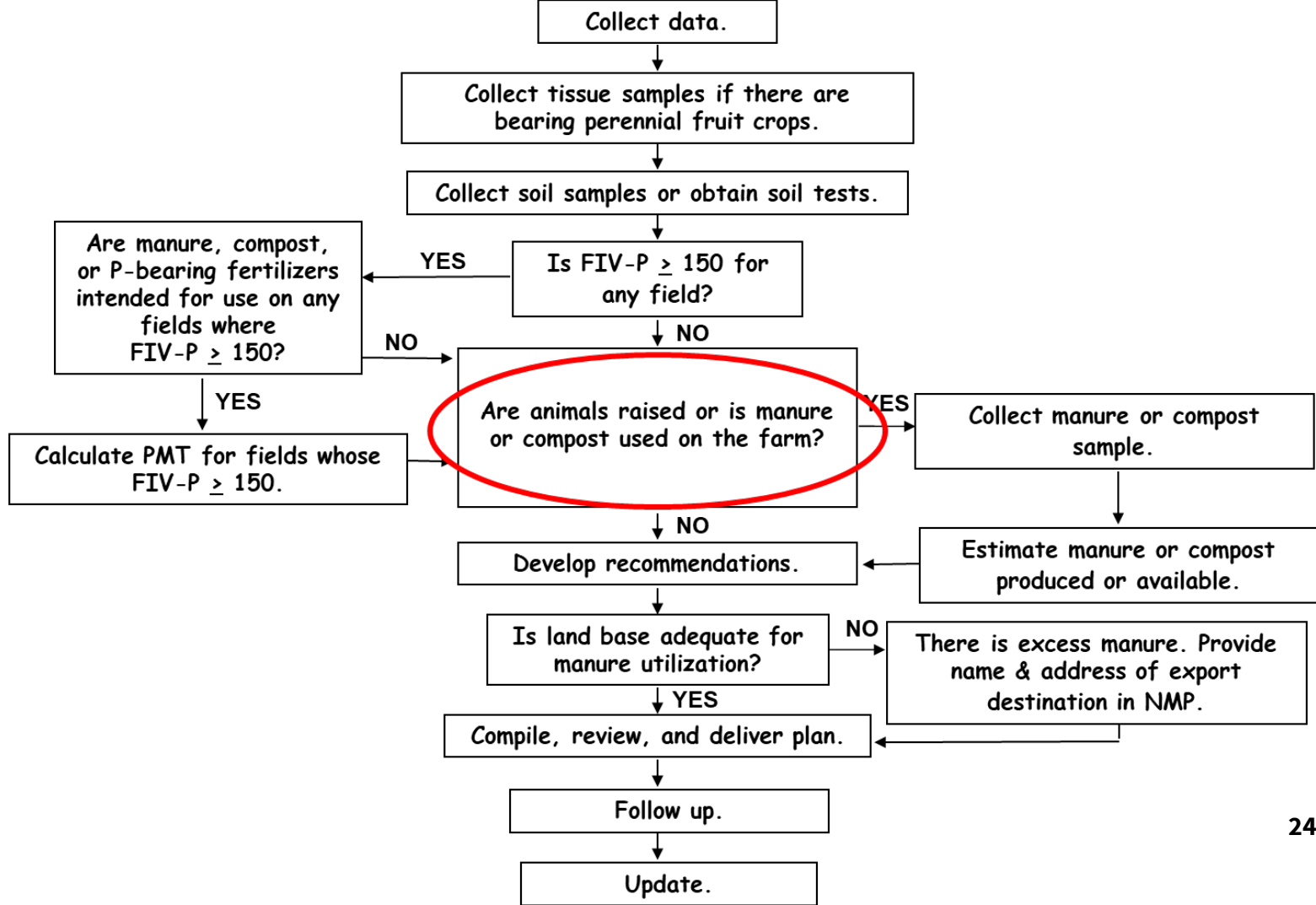




Is a PMT Needed?

- determine slope length and gradient
- measure distance to surface water
- measure width of field buffers
- identify tillage practices and timing
- identify crop rotation
- estimate dates of planting and harvest





Is Manure Produced on the Farm?

- collect a manure sample if > 20 AU
 - as close to application as possible
 - Ch.8 .05 F(3) - twice a year until uniform level is established, then every 2 years (alternatively, they can be taken annually)
- How much manure is generated annually?
 - collect data to estimate quantity
 - Excel spreadsheet on web site



Animal Production and Manure Data Collection Sheet

Operator Name: _____ Date: _____

Farm Name: _____

What months is manure spread? _____

Date of Last Spreader Calibration: _____

Do you have storage? _____ Type: _____ Capacity: _____

If you import manure from another farm, give the operator's name and address:

Livestock Information

	1	2	3
Livestock group			
Date of last manure analysis			
Average weight per animal (pounds)			
Number of animals			
Full days confined during manure production period			
Days partially confined during manure production period			
Hours per day confined			

Bedding Estimation

	1	2	3
Bedding type (straw, sawdust, etc.)			
Volume of bedding this production period (cubic feet)			
Provide (1) or (2)			
(1) Density of bedding (pounds per cubic feet)			
(2) Weight of bedding (tons)			



You can only edit values highlighted in blue

Farm name:

Manure Production period:

Starting date:

Ending date:

A. Total days in manure production period:

0

Livestock Information

B. Livestock group	1	2	3
C. Average weight (lbs.)			
D. # of animals			
E. Animal units (AU) [(C x D)/1000]	0	0	0
F. Full days confined during manure production period			
G. Days partially confined during manure production period			
H. Hours per day confined			
I. Day equivalents partially confined (G * H)/24	0	0	0
J. Total day equivalents confined (F + I)	0	0	0
K. Total day equivalents unconfined on pasture (A - J)	0	0	0
L. Weight of manure/AU/day (lbs.) (see Table 1.)			

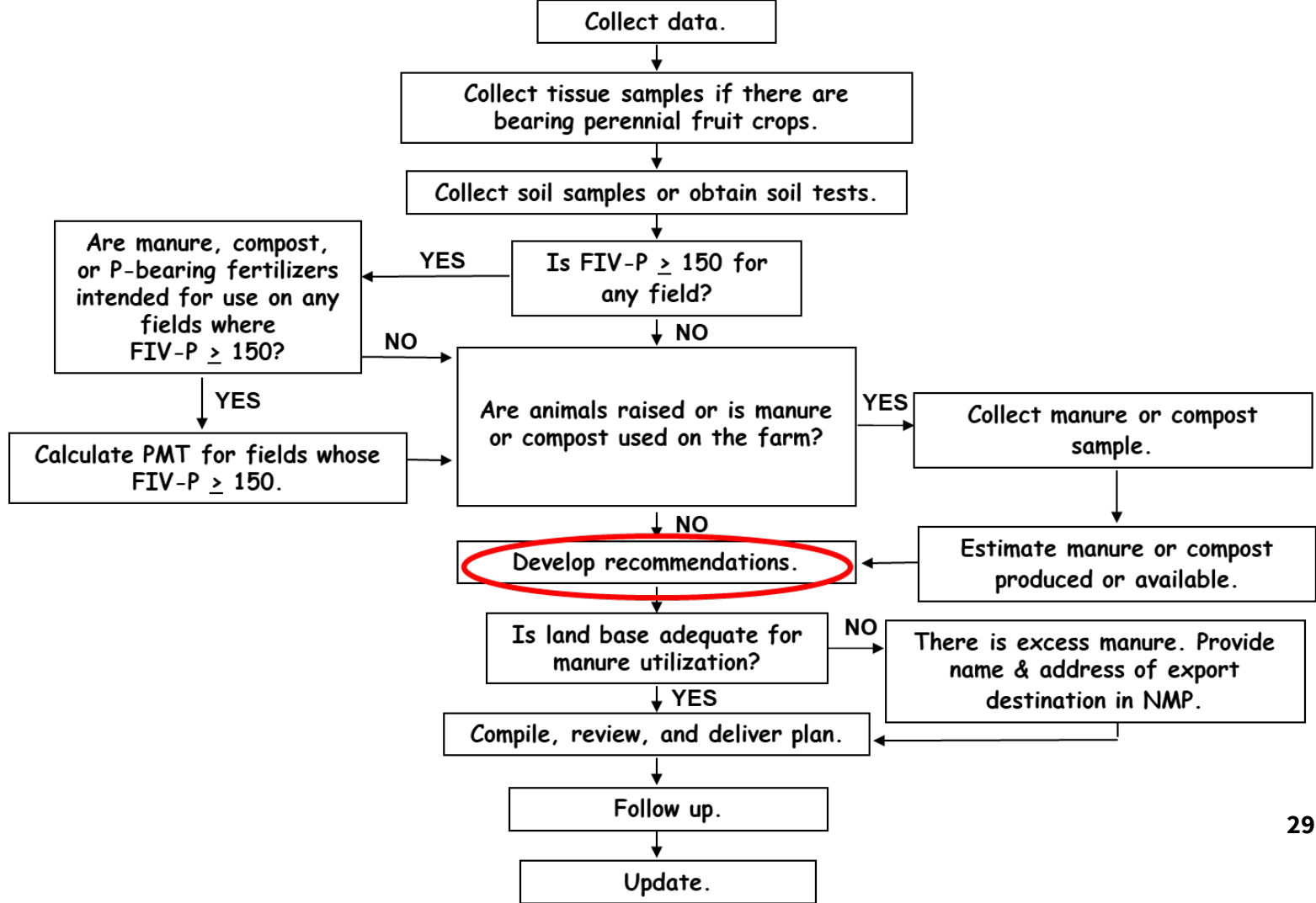


Manure Quantity Estimation (Solid Only)						
Operator	Joe Brown			Organic Source	Beef	
Production Period	1	Starting Date	01/01/2022	Ending Date	12/31/2022	Total Days 365

Livestock Information	1	2
Livestock group	Bf. bull	Bf. cow
Average weight, lbs	1800	1000
Number of animals	1	10
Animal units	1.8	10.0
Starting date	01/01/2022	01/01/2022
Ending date	12/31/2022	12/31/2022
Total days	365	365
Full days confined		
Days partially confined	365	365
Hours per day confined	10	10
Total time confined, days	152.1	152.1
Total time on pasture, days	212.9	212.9
Weight of manure, lbs/AU/day	63.0	63.0
Bedding Estimation	1	2
Bedding type	Bl.wd.shvgs	Bl.wd.shvgs
Density of bedding, lbs/cu.ft.	5.0	5.0
Volume of bedding, cu.ft.	1000.0	8000.0
Weight of bedding, tons	2.5	20.0
Uncollected Manure		
Manure left on pasture, tons	12.1	67.1
Collected solid waste	1	2
Manure, tons	8.6	47.9
Solid manure & bedding, tons	11.1	67.9
Total weight from all groups, tons	79.0	
Link to Solid Manure Analysis	Joe Brown	

This can also
be done in
NuMan Pro 5.3
software





Nutrient Recommendations

- the essence of a nutrient management plan
- the amount of a nutrients recommended for crop production at the yield goal indicated.
- recommendations are based on long-term soil fertility research.



Sources of Recommendations

- SFM-1 (agronomic crops)
- EB-236 (vegetables)
- various info sheets for minor crops
- ***NuMan Pro* software**
- Maryland Nutrient Management Manual
- Nutrient Management Web site – FAQ's



Things to Consider When Making Recommendations

Do any fields have residual nitrogen?

- If so, residual N (a.k.a. N credits) must be estimated.
- Remember, N recs in SFM-1, EB-236 and fact sheets are “gross N” recs.



Identify the Nutrient Source

- Which fields will receive commercial fertilizer as the nutrient source?
- Which fields will receive manure as the nutrient source?

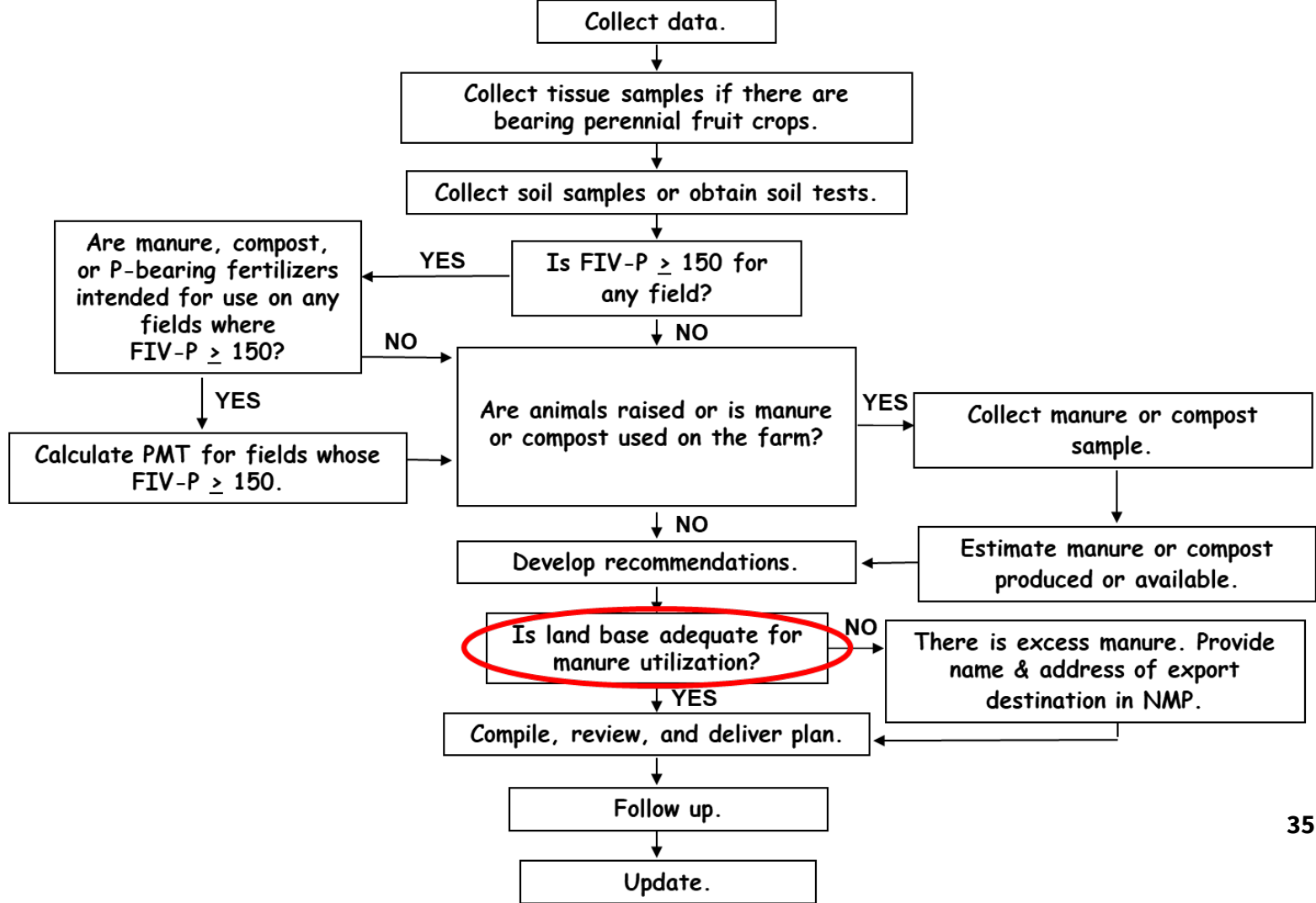


Using Manure?

For fields receiving manure

- Is incorporation required?
 - within 48 hours
 - unless no-till (or perennial crop)
 - unless MDA specifically requires incorporation





Adequate Land Base or Excess Manure?

- If a producer is using manure:
 - check to see if producer has enough fields available to receive manure at the time when the manure is available.
- Complete the manure utilization and allocation summary
- Name and address of export destination if excess manure exists



Type information in yellow cells; blue cells have a pull down list from which you must choose.

Manure Utilization Information

Period of Application	Fields Available	Acres	Manure Application Rate	Units	Manure Utilization Potential
Spring	1	2.00	10.00	Tons/ac	20.00
	2	11.00	10.00	Tons/ac	110.00
	3	6.00	10.00	Tons/ac	60.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
				Tons/ac	0.00
			Total		190 Tons



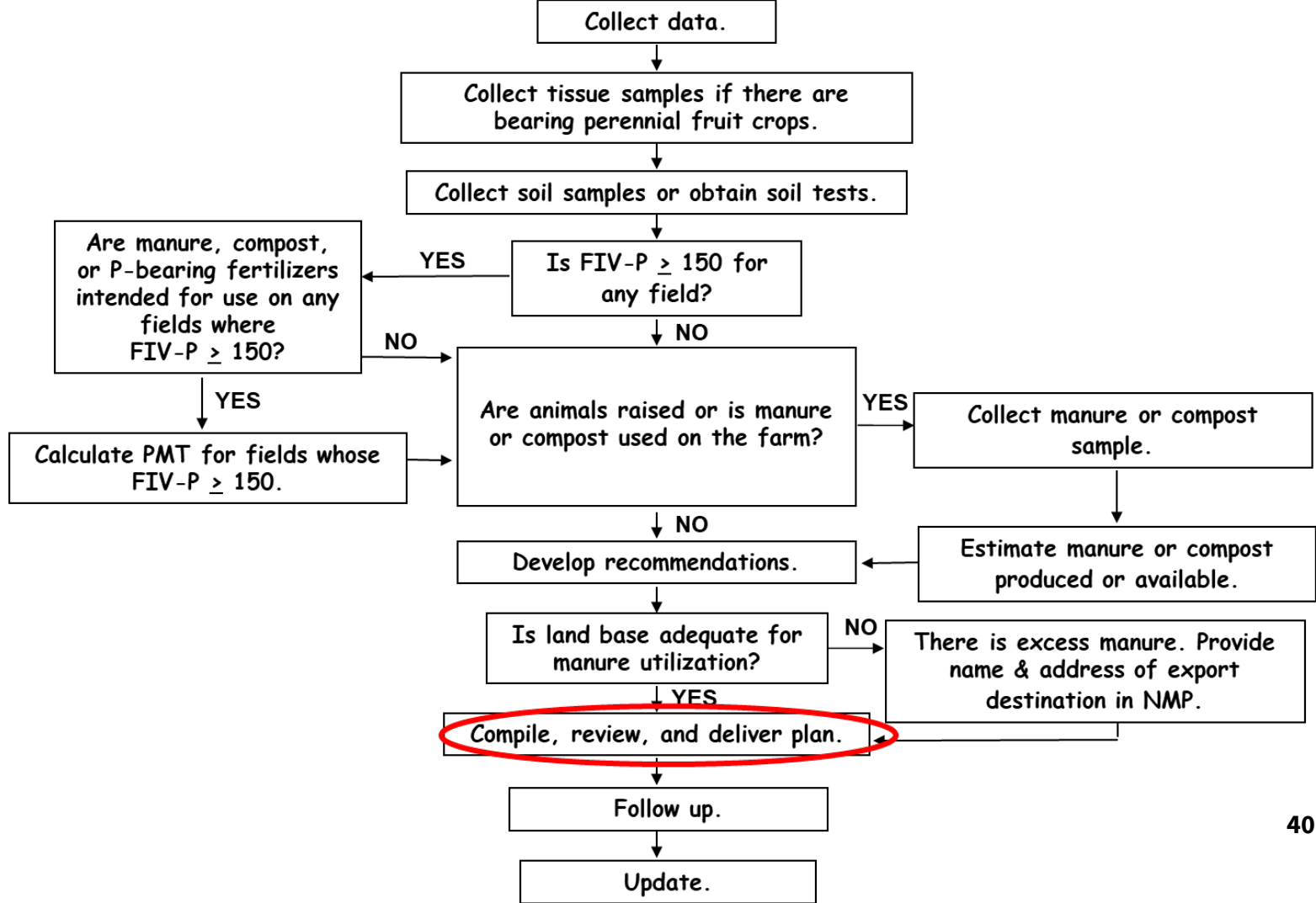
	A	B	C	D	E	F	G
55	Manure Allocation Summary						
56	Period of Application	Spring	Summer	Fall	Winter		
57	Period for Manure Generation						
58	Manure Available for Use per Period	200.00					
59		Tons	Tons	Tons	Tons		
60	Manure Utilization Potential per Period						
61		190.00	0.00	0.00	0.00		
62	Excess or Deficit (-)	10 Tons	0 Tons	0 Tons	0 Tons		
63	*If excess, indicate name and address of export location in cover sheet						



Organic Waste Balance					Total Area, acres: 5.4	Year: 2022
Operator: Example Farmer		Organic material: 2022Horse Manure (Solid)				
Amounts collected, Tons		05/15/2021 - 05/14/2022	29.8	0.0	Total collected, Tons	29.8
Seasonal Projected Appl., Tons					Total exported, Tons	0.0
	Winter	0.0	Spring 21.6	Summer 0.0	Fall 0.0	Total Proj. Appl., Tons
Potential applications					Over limit, Tons	8.2
Month	Tract/Farm	Field	Crop	Area, acres	Proj. Appl Rate T/A	Projected applic. T
E. May	Example	Hay	74. Orchardgrss; Maint.	5.4	4.0	21.6

This can also be done in
NuMan Pro 5.3
 software





Assembling the Plan

- cover sheet
- nutrient application setback form
- maps
- soil test results
- tissue analysis (if applicable)
- manure analysis, generation & allocation
- recommendations (fertilizer &/or manure)
- any additional information



NUTRIENT MANAGEMENT PLAN
FOR
Name
Address

BRIEF DESCRIPTION OF OPERATION: (type and size of operation)

DATE OF PLAN: (date completed)

DURATION OF PLAN: (month, day, and year(s) the plan includes)

SOIL SAMPLING AND TESTING: (who collected the samples; lab and date where samples were analyzed?)

MANURE SAMPLING AND TESTING: (who collected the samples; lab and date where samples were analyzed, if applicable?) Omit this paragraph if no animals are raised **and** no manure is utilized on this farm.

(new wording) **MANURE MANAGEMENT:** In a sentence or 2, highlight the operator's approach to manure management: dairy with storage and that spreads in the spring and exports in the fall? farm with storage that is spread in spring and fall? broiler producer that crusts out after every flock? broiler producer that windrows and cuts middles at some frequency? Indicate the amount of storage (volume or duration) or size of storage.

If manure (on-farm generated or imported) is to be applied, indicate the total number of acres on which manure recommendations are given.

If manure is exported, indicate the name and address of recipient, and the following...

Manure Management of Agricultural Operations (MMA) ...



Need Help?

Technical Resources

- University of Maryland Nutrient Management Specialists
- www.extension.umd.edu/anmp



Delivering the Plan

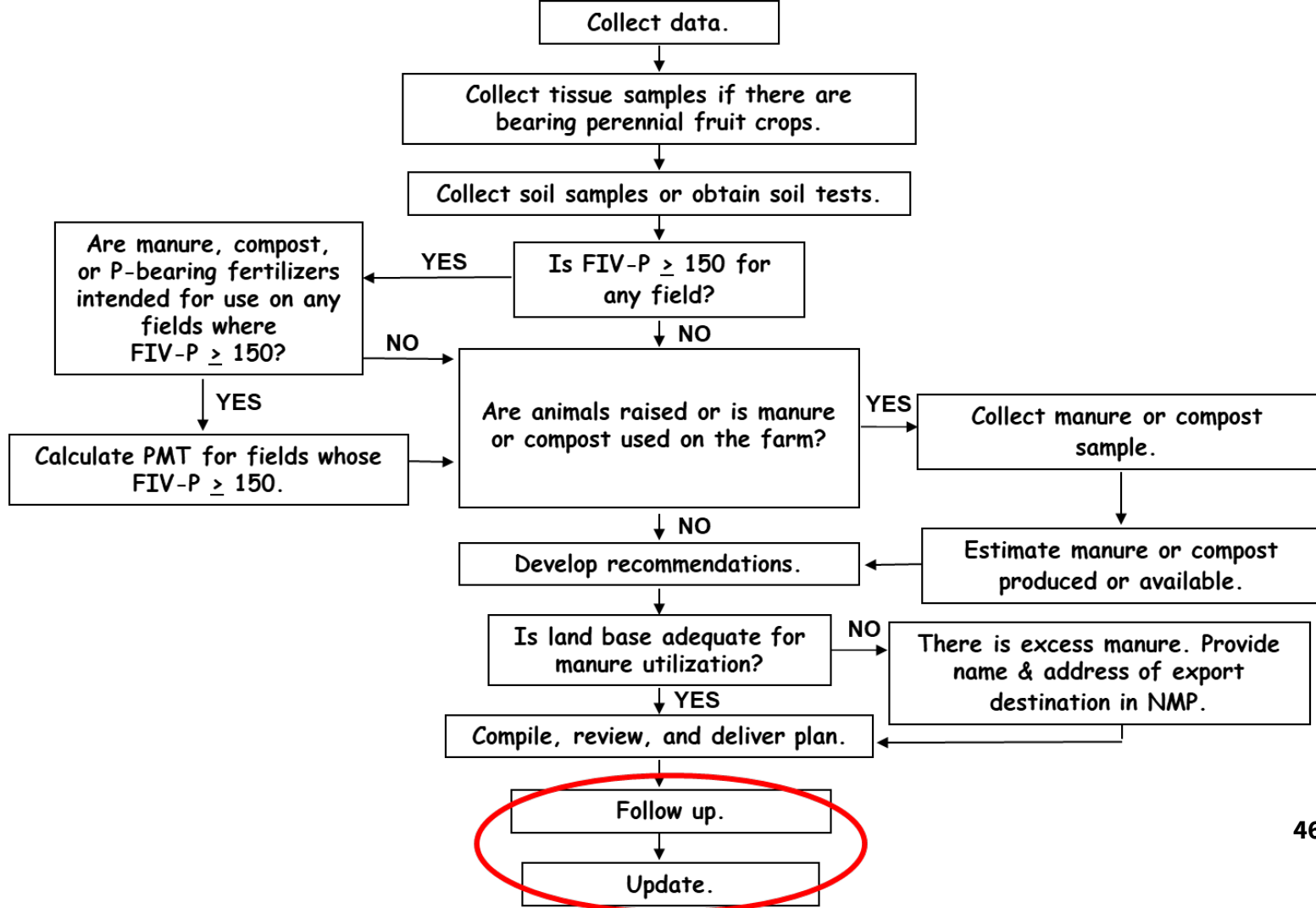
- Explain it!
- Show the farmer where to find recommendations.
- Tell them if you have given recommendations for multiple crops.
- Tell them if you have given recommendations for both manure and commercial fertilizer.



Delivering the Plan (continued)

- Mention record keeping
- Mention update requirements
- Mention the Annual Implementation Report (AIR)
- Reinforce the requirement for setbacks
- Reinforce the requirement to communicate with custom applicator about recommendations and setbacks





Follow Up Activities

- Would the producer benefit from PSNT analysis on corn fields?
- Does the producer need an FSNT on wheat or barley fields?
- Is a manure spreader calibration needed?
- Will you contact the producer to let them know an update is needed or should they contact you?



What Happens Next on the Road to Certification?

- Phase 1
 - Register for the certification exam
 - Pass the exam
- Phase 2
 - Further training
 - How to Write a Nutrient Management Plan
 - PMT workshops



Exam Prep

- Review questions available on our website (not a comprehensive list)

www.extension.umd.edu/anmp

Click on ***Additional Resources*** tab > Study Materials for the MD Nutrient Management Certification Exam



Nutrient Management Resources

In addition to providing general information on nutrient management planning, the Agricultural Nutrient Management Program has additional information available for the following topics:

Publications



Study Materials for the MD Nutrient Management Certification Exam



Organic Nutrient Value Calculator (ONVC)



Web Soil Survey (WSS)



Nutrient Management Web Links



Educational Videos



Archive



Study Materials for the MD Nutrient Management Certification Exam ^

The following study materials will help prepare you to take the Maryland Nutrient Management Certification Exam:

Example Questions

- [Maryland Nutrient Management Certification Exam - Example Questions](#)

Fundamentals of Nutrient Management Course

- [2021 Presentations, Slides, and Additional Resources](#)

Publications

- [Mid-Atlantic Nutrient Management Handbook \(PDF File\)](#)
- [Chapter 1 - Introduction to Nutrient Management](#)
- [Chapter 2 - Regional Landscapes and the Hydrologic Cycle](#)
- [Chapter 3 - Concepts of Basic Soil Science](#)
- [Chapter 4 - Basic Soil Fertility](#)
- [Chapter 5 - Crop Production](#)
- [Chapter 6 - Soil Management](#)
- [Chapter 7 - Nutrient Testing, Analysis, and Assessment](#)
- [Chapter 8 - Commercial Fertilizers](#)
- [Chapter 9 - Manure as a Nutrient Source](#)
- [Chapter 10 - Land Application of Biosolids](#)



How to Write a Nutrient Management Plan Training

- Fall - TBD
- Subscribe to our listserv for notification of this event and other CEU opportunities:
go.umd.edu/ANMP-email-signup



Keeping Certification Active- Training Opportunities

- Check Websites

- <http://extension.umd.edu/anmp>

- http://mda.maryland.gov/resource_conservation/Pages/nutrient_management_training_program.aspx



Kayla Griffith

Faculty Specialist, M.S., CCA

kmgriffi@umd.edu

Phone 301-226-7439



Questions?

Please complete these two surveys

Demographics:

https://ume.qualtrics.com/jfe/form/SV_aeMEcpGGPY5uUke

