Baseline Questionnaire: Hello Citizen Scientists,

Thank you so much for agreeing to participate in the Citizen Science Soil Health Project. I hope that with your help, the project will be a rewarding experience for us all.

YOUR NAME:

YOUR FARM'S NAME:

YOUR FARM'S PRODUCTS:

SNAIL MAIL ADDRESS:

E-MAIL ADDRESS:

BEST PHONE NUMBERS to reach you:

1. **The easiest way to communicate with the group is by email. Which communication method is best for you?**
   - ☐ Email works for me.
   - ☐ Snail mail works better for me.
   - ☐ Other:_____

2. **Please let me know the best way to reach you quickly (for soil probe delivery, sample pick-up).**
   - ☐ Phone me at:
   - ☐ Other:

3. **Regarding a group contact list, please let me know:**
   - ☐ Yes, add me to the contact list and share my contact info with the group.
   - ☐ Please do **NOT** share my contact info with the group.

4. **When you go out to take your soil samples, we will ask you to document the location where you are taking your samples, by taking a photo of the location and noting the GPS coordinates of your location. Which applies to you?**
   - ☐ I have a smart phone and know how to use it. I know how to take a photo and email it to you. I also know how to use the compass feature and find the GPS coordinates of the location I am sampling.
   - ☐ I have a smart phone but am not sure how to email a photo and/or how to use the compass feature to find GPS coordinates.
   - ☐ I have a cell phone but I don't know whether it has a compass feature.
   - ☐ I don't have a phone that can do all this stuff. I will need to document my location in another way.
   - ☐ Other:

5. **A soil probe for taking your soil samples will be provided as part of this project. Which applies best to you?**
   - ☐ I already have a soil probe and don't need another one.
   - ☐ I don't have a soil probe. Please provide me with one.

6. **Our annual questionnaire will ask about soil and crop management at your soil sampling site, including: tillage, cover-cropping, organic matter inputs, planting and harvesting dates, costs of soil inputs, yield, water use, and unusual weather. Which answer best applies to you?**
   - ☐ I already keep detailed farm records and I will have no problem answering your questions as I already track all that data.
   - ☐ I keep some farm records so I will be able to answer some of the questions but not all of them. It might be helpful if you provide me with a way to track those things.
   - ☐ I don't keep farm records. I will need you to provide me with a way to track those things.

7. **What kinds of farm management information are you NOT willing to share with this project?**

8. **You are the investigating Citizen Scientists in this project, so you decide what question you want your own soil health test to answer. What is the initial question that you want your soil health test(s) to answer?** (You can change your question later as the project continues.)

9. **Does this statement accurately describe you? "I understand broad soil health principles pretty well, and know WHAT I should be doing. My challenge is figuring out HOW to do it, HOW to apply broad soil health principles, given our challenging growing conditions and economics."**
   - ☐ Yes, that statement describes me.
   - ☐ No, a better way to describe me is:

10. **Are there any management changes that you are thinking of implementing that you want to monitor with soil health tests?**
    - ☐ NO
    - ☐ YES. If YES, please describe:

11. **As Citizen Scientists, you choose where you take your soil samples. But think carefully: once you pick your sampling location you are stuck with that same sampling location for the next 10 years.** Which applies to you?
    - ☐ I know exactly where I want to take my samples.
    - ☐ I have some ideas about where I want to take my samples but I'm not totally sure yet.
    - ☐ I don't know. I haven't given it much thought yet.

12. **The following things can skew test results and give you a higher or lower soil heath score. Which of these things will be an issue for you in choosing the timing of your test (May/June or Sept./October), so that you get an accurate reading?**
    - ☐ **Soil temperature:** Soil microbes are fairly dormant in the winter. They start growing and multiplying in the spring as soil temps increase. Different kinds of microbes peak at different points during the growing season, and then slowly taper off at the end of the growing season. This is why you check that your soil temperature is >55°F for May/June sampling and > 50°F for September/October sampling. It is also why you sample your soil at the same time each succeeding year, so you are comparing apples with apples and not oranges.
    - ☐ **Wet saturated soil or prolonged drought**: If your soil is very muddy and saturated from rain or irrigation, wait to sample, until it is drained and just moist. If it is experiencing significant drought, wait until after rain or irrigation if possible. If you can't wait, document that soil is experiencing drought when sampled.
    - ☐ **Fertilizer and soil amendment applications (mulch/compost/cover-crop/manure):** These soil amendments can significantly skew your test results if applied shortly before you sample. Sample either before any application of soil amendments, or wait at least 6 weeks after application to sample. A light application of compost tea can be sampled after just 2 weeks.
    - ☐ **Tillage:** Tilling disrupts soil microbial communities, causing some populations to spike up quickly, and others to crash. Sample either before tillage, or wait to sample until at least 6 weeks after last tillage.
    - ☐ **Pesticide and herbicide applications:** The verdict is still out here. To be on the safe side, sample before, or wait at least 2 weeks after pesticide application before sampling.
    - ☐ **Storing your sample correctly:** Try to keep your sample near or below the soil temperature at which it was taken. Put your sample on ice in a dark location if sampling during hot times. Heat destroys fatty acids much more than cold, so freeze samples as soon as possible.

13. **When are you going to test your soil?**
    - ☐ In May/June, when soil temps are above 55 degrees, or
    - ☐ During September/October, when soil temps are above 50 degrees?

14. **The Haney and PLFA tests monitor soil biology, which shuts down as soil temperatures drop. To get an accurate test, soil temps should be above 55 degrees for spring testing and above 50 degrees for fall testing. Which applies to you?**
    - ☐ I routinely check my soil temps and can assess if my soil is warm enough to test.
    - ☐ I will need some help with this.

15. **You are getting one FREE Haney plus PLFA soil health test of a single location for 10 years. If you want to test more locations, you can buy more tests yourself through us. We will report and track these additional tests the same way we report and track the free tests. Discounted costs for extra tests: Haney- $39.60; PLFA- $47.60. Which applies to you?**
    - ☐ I want to buy extra Haney test(s). How many?
    - ☐ I want to buy extra PLFA test(s). How many?

- ☐ I don't want to buy any other tests at this time.
- ☐ I still don't know what I want to do. I haven't decided yet.

16. Regarding previous soil testing you may have done, which applies to you?

- ☐ I have never tested my soil.
- ☐ I test my soil every now and then, but it's been a while.
- ☐ I test my soil every year.
- ☐ My crop consultant takes care of all soil testing for me.
- ☐ The soil tests I have run are:
    i. Lab used:
    ii. Name of test:
- ☐ I'd rather not say.

17. If you have already conducted <u>soil health</u> tests, we would like to add your results in with ours, to extend our data points. Which apply to you?

- ☐ I have never conducted any other soil health tests on my fields.
- ☐ I think the County/City may be doing some soil sampling on my fields, and may have some soil health test results.
- ☐ My crop consultant may have conducted some soil health tests on my fields.
- ☐ I have conducted soil health tests previously and I may be willing to share the results with you.
    - Name of test and Lab:

18. Based on your own experience and things you have heard/read, which of the following practices do <u>YOU</u> believe are useful for improving soil health? Please check all that apply.

- ☐ Ample irrigation water
- ☐ Base cation saturation ratio
- ☐ Biochar
- ☐ Biodynamic farming methods
- ☐ Companion planting
- ☐ Compost applications
- ☐ Compost tea drenches/foliar sprays
- ☐ Conventional fertilizers
- ☐ Cover crops
- ☐ Crop rotation
- ☐ Fungal soil inoculations
- ☐ Integrating livestock into your crop rotation
- ☐ Keeping a living root in soil longer
- ☐ Leaving plant residue on the soil surface
- ☐ Managed rotational grazing /"holistic" grazing
- ☐ Manuring
- ☐ Mulching
- ☐ No-till
- ☐ Organic fertilizers
- ☐ Reduced tillage
- ☐ Remineralization
- ☐ Turning in plant residue
- ☐ Using only organic OMRI pesticides
- ☐ Other:

19. In the list above, please circle the practices which you currently use on your farm/ranch/land.

20. Reducing soil disturbance or tillage improves soil health. What is your experience with reduced tillage?

- ☐ I use strip-till as part of my regular crop rotation. Describe:
- ☐ I use no-till as part of my regular crop rotation. Describe:
- ☐ I have NOT been able to reduce tillage because my weed pressure is so high
- ☐ I have been able to reduce my tillage a little bit by:
- ☐ Other:

21. One way to improve soil health is to increase the time there is a living root in your soil. What is your estimate of the number of days/year of living cover you currently have on the land you are going to test?

- ☐ 120-150 days/year average
- ☐ 150-180 days/year average
- ☐ 180-210 days/year average
- ☐ 210 -240 days/year average
- ☐ 240-270 days/year average
- ☐ 270-300 days/year average
- ☐ 300-330 days/year average
- ☐ > 330 days/year average

22. Cover crops can improve soil health and fertility. But they can be challenging to pull off in Colorado. What are your past experiences with cover crops? Please check all that apply to you.

- ☐ I've never tried cover crops.
- ☐ I tried cover crops one time but they didn't work. Haven't tried them since.
- ☐ The mice ate my cover crops.
- ☐ The geese ate my cover crops.
- ☐ The winter killed my cover crops.
- ☐ The weeds out-competed my cover crops.
- ☐ My cover crops didn't germinate: no water.
- ☐ My soil isn't fertile enough to grow a decent cover crop. It's not worthwhile.
- ☐ My cover crops grew too tall to handle with my current machinery.
- ☐ Cover crops work well for me.
- ☐ Other:
- ☐ The most successful cover crops for me are:
- ☐ The cover crop varieties I have tried are:

23. A big challenge for establishing fall cover crops is the availability of fall water. What describes your own fall-watering challenges?

- ☐ I have no problem accessing water in the fall to establish fall cover crops.

- ☐ I don't have fall irrigation water, but have been generally successful timing cover crop planting in tandem with fall storms, so my cover crops have mostly germinated OK.
- ☐ I don't have fall irrigation water, and I had bad germination of fall cover crops when I tried them.
- ☐ I don't have fall irrigation water, and so have decided not to risk planting fall cover crops.
- ☐ Other:

24. Organic inputs such as compost, mulches, crop residue and manure can jumpstart soil microbiology and improve soil health. What has your experience been with these amendments? What kinds of problems have you had with them?

- ☐ I regularly use compost, mulches, crop residues and manures to improve my soil.
- ☐ I have a hard time getting as many organic inputs as I would like.
- ☐ My main impediment in applying more organic inputs is: (Circle ones that apply).
  - price
  - hauling costs
  - availability
- ☐ I don't use organic inputs because:
- ☐ I have had a bad experience with organic inputs. Please describe:

25. Integrating livestock into your rotation can improve soil health. Animals can mash organic material into the soil, and fertilize a field with manure and urine. But integrating livestock can be challenging and inappropriate in some situations. What are your challenges with integrating livestock into your operation?

- ☐ Getting water to livestock is limiting how I can integrate them.
- ☐ I don't have adequate fencing to integrate livestock well.
- ☐ I don't have animals, and don't want any.
- ☐ Livestock are not appropriate for my operation because:
- ☐ I have integrated livestock successfully. My main challenge was:
- ☐ The kind of livestock that integrates best with my operations is:

26. **Increasing crop diversity can improve soil health. Please describe your current crop rotation in the area(s) you are going to test**.

THANK YOU! Return to Elizabeth Black 4340 N 13th St. Boulder CO 80304
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