NIRS user manual for the ASD Fieldspec4

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Introduction

The following manual corresponds to a quick user guide to set up the ASD Fieldspec4 in the installations of Vanuatu Agricultural Research and Technical Center (VARTC).

It contains instructions to take spectral measures on sweet potato fresh roots cut in half and grated. The same instruction can be applied for other roots and tubers

More about the machine's technical specifications [here](#)

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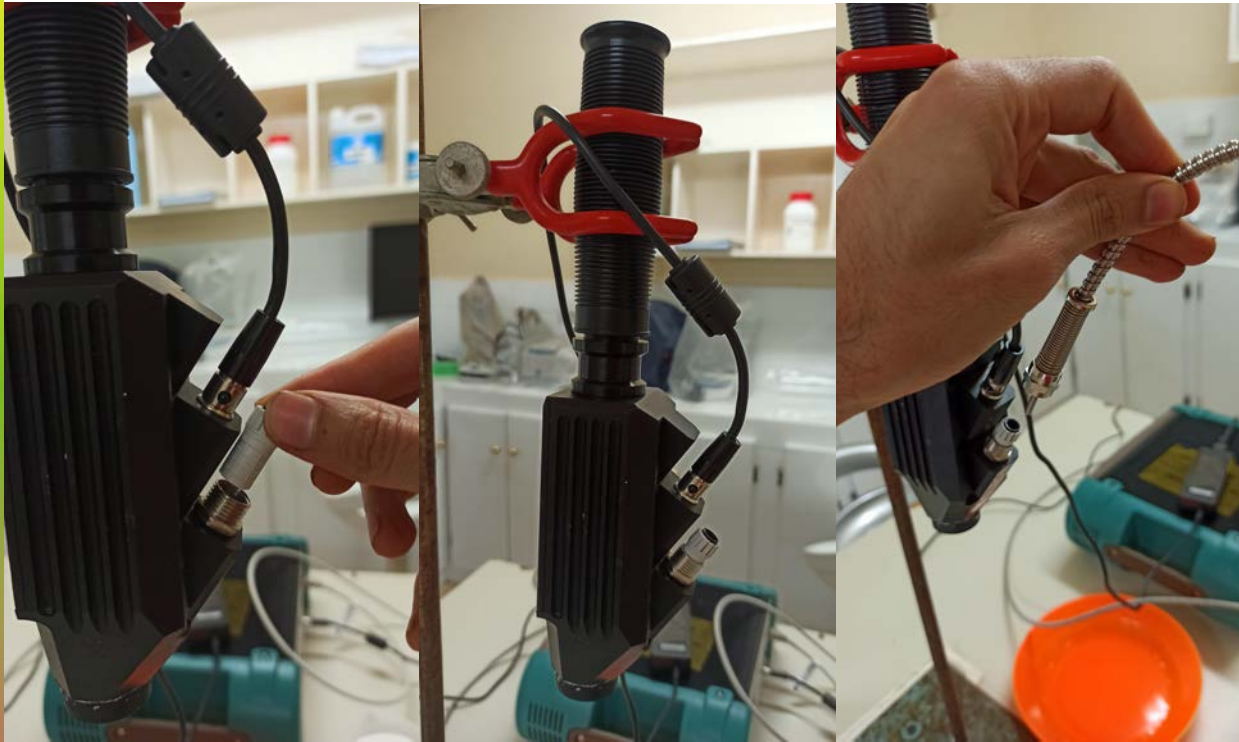*Fraternité*

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Setting up the machine

1. Connect the power source to the NIRS

   - Don't tight too much the screw

2. Connect the power source to the mug light

   - Align the clip (pink circle on the left) with the security hole (pink circle on the right

Setting up the machine

3. Put the optic fiber inside the mug light

- Optic fiber is the most delicate part, be very careful
- Verify that the optic fiber is visible from the glass
- Don't tight too much the screw
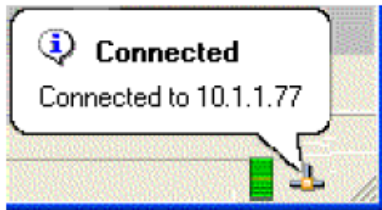
Setting up the machine
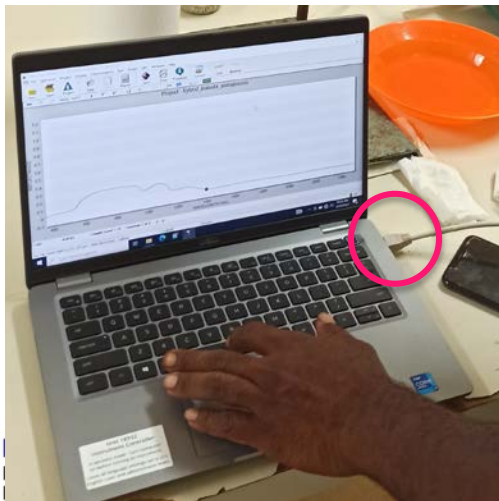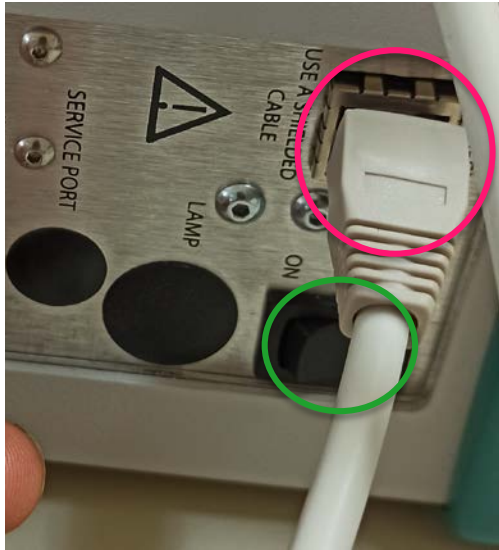
Ethernet cable

4. Connect the ethernet cable between the NIRS machine and the computer (pink circles)

5. Turn the NIRS machine on (green circle), turn the computer on and wait for 30 minutes before starting to work

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Creating and configurating a project

- Click in the Indico Pro icon in the desktop

- Verify the NIRS machine is connected in the icon in the lower left corner

- Click in the « New » icon

Creating and configurating a project

- **Write the name of the project**
  - Suggestion: always use lower bar « _ », instead of space. For example write « kumala_project » instead of « kumala project »

Indico Pro

New Project

Enter a Project Name

Kumala_project

OK

Cancel

A Directory by this name will be created to store your spectrum and model files
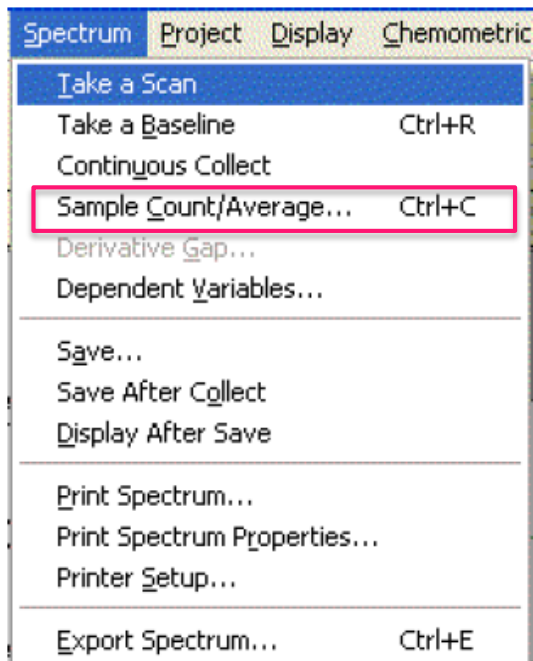
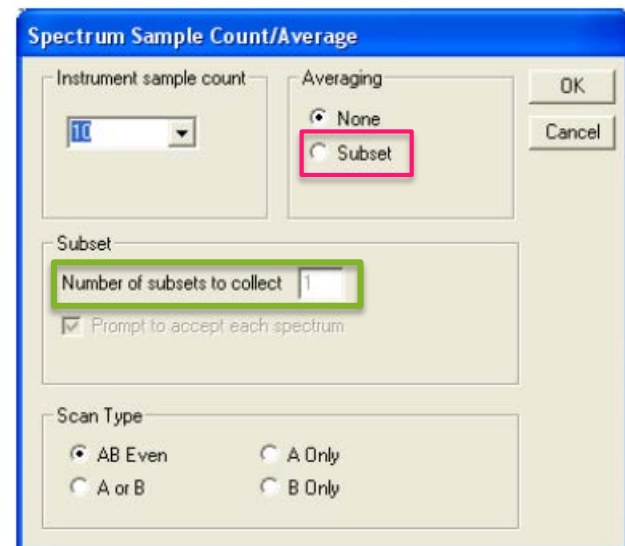C:\Program Files\ASD\IndicoPro\projects\

Change Directory

Creating and configurating a project

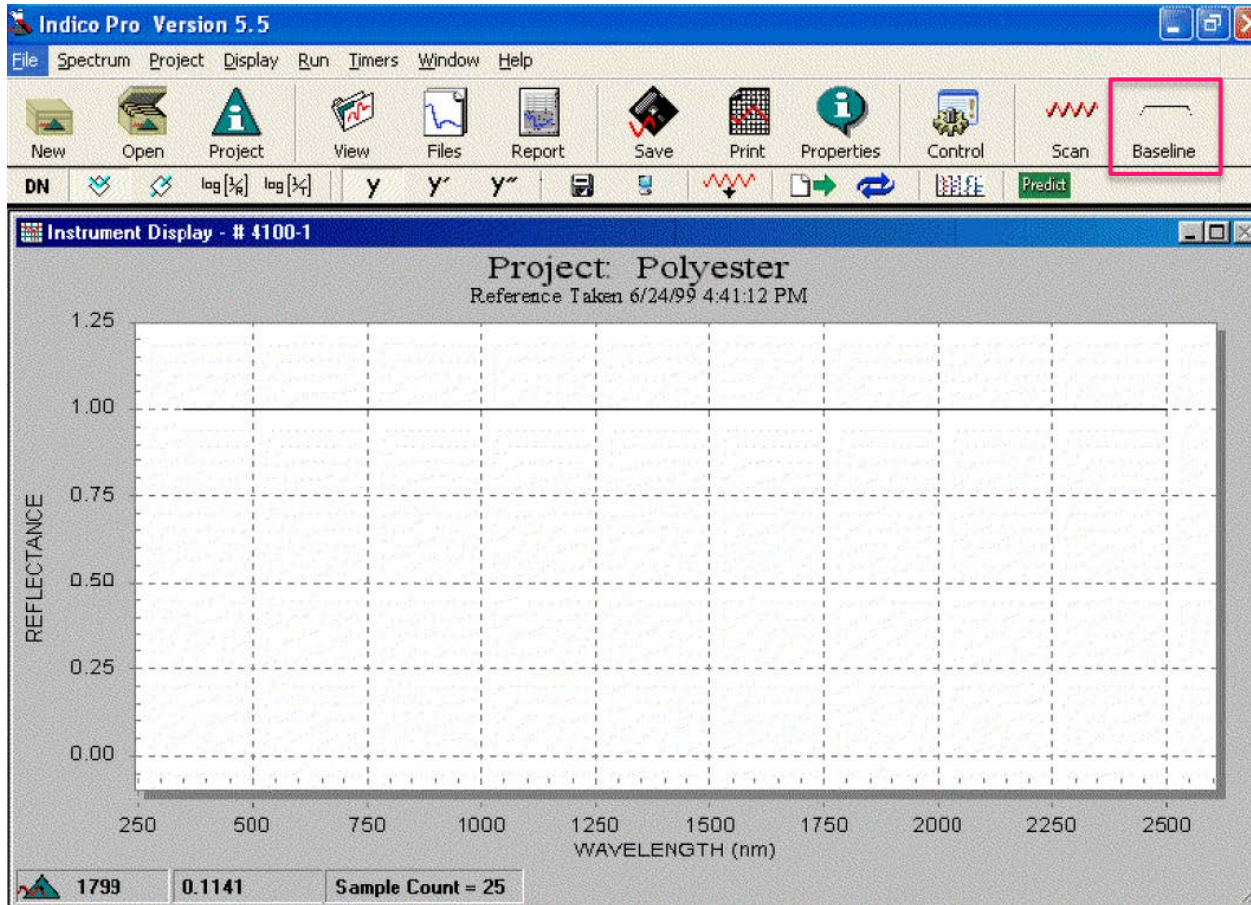- Click on Spectrum then Sample Count/Average (pink square)

- Change instrument sample count to 10
- Click the subset option in the Averaging window (pink square)
- Change the « Number of subsets to collect to 3 (green square)

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Setting the baseline

- Put the spectralone cap on the mug light

- Click in the baseline icon (pink square). The result should be a flat line in reflectance value 1

 - If you have a different result, wait 15 minutes more or check the spectralone is clean

Whole root sample preparation

- Wash and dry the roots

- Cut in half with a clean cut
- Take one half for NIRs scan and save to other for dry matter measure

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Whole root scan measure

- Clean the latex on the surface of the cut root
- Put the root on the mug light as quick as possible
  - Press the root tightly so light doesn't scape
- Press spacebar or click the scan button
- Check the spectra on the screen and press spacebar again to accept the result and repeat three times
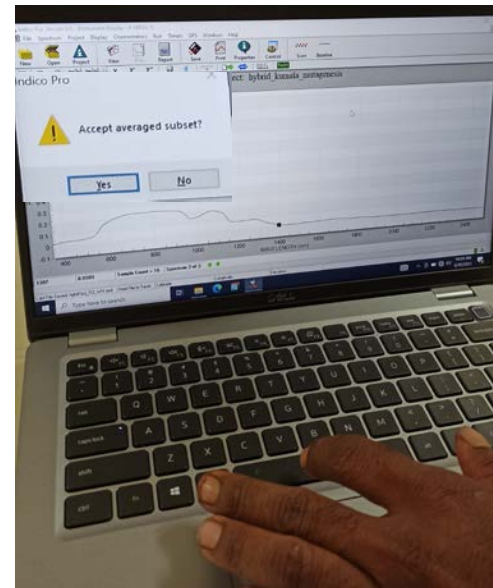
# Whole root scan measure – Important consideration

- If you don't have a clean cut, don't be afraid to cut a small slice until you have a clean cut
- Don't wait too long to make the scan after cutting the root in half and cleaning because the flesh oxidizes and changes color (turns brown/black)
  - If you see oxidization cut a small slice and clean before measuring
- Don't use rotten or spongy roots

latex

spongy

oxidization
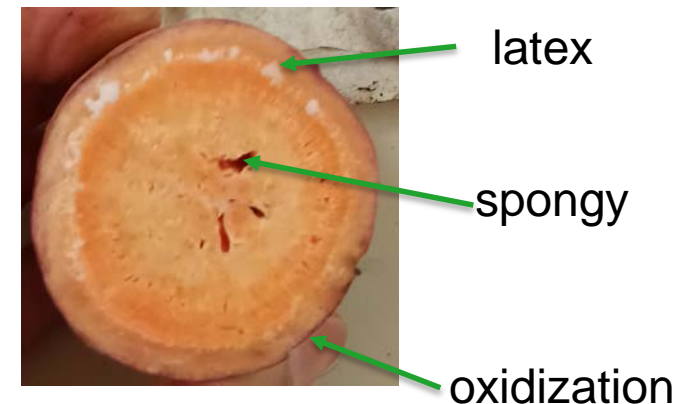
Saving result

- Click on the save button

- Copy the sample code from the tag on the field adding a zero before number from 1 to 9 and "_WH" for whole root and "_GR" for grinded roots

  - For a whole root sample if the tag on the field is: [T25-05-02] P2-R1 the right name when saving is: T25_05_02_P2_R1_WH
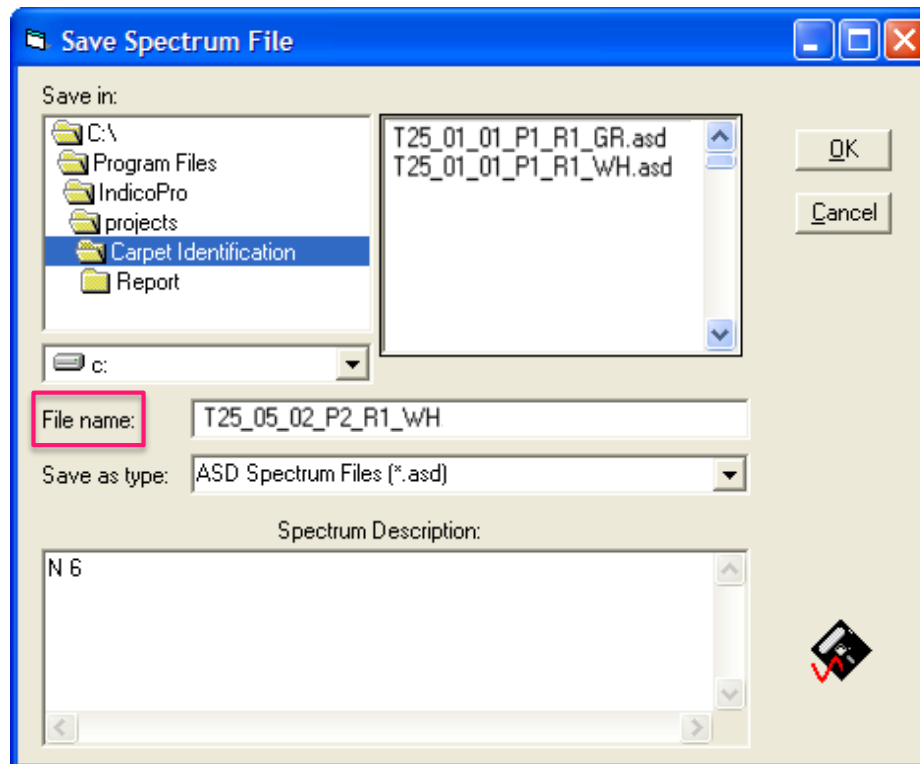
Grinded root sample preparation

- Peel the same half root used for the NIRS scan

- Grate it and put it in a small pot
  - Clean and dry the dish with towel before grating
- If you get very few purée, use a smaller pot and try to make the layer as thick as possible

Grinded root scan measure

- Put the pot with the grinded root in the mug light as quick as possible

  - Grinded samples oxidize quicker than whole roots

- The process for taking and saving the result is the same as for whole roots
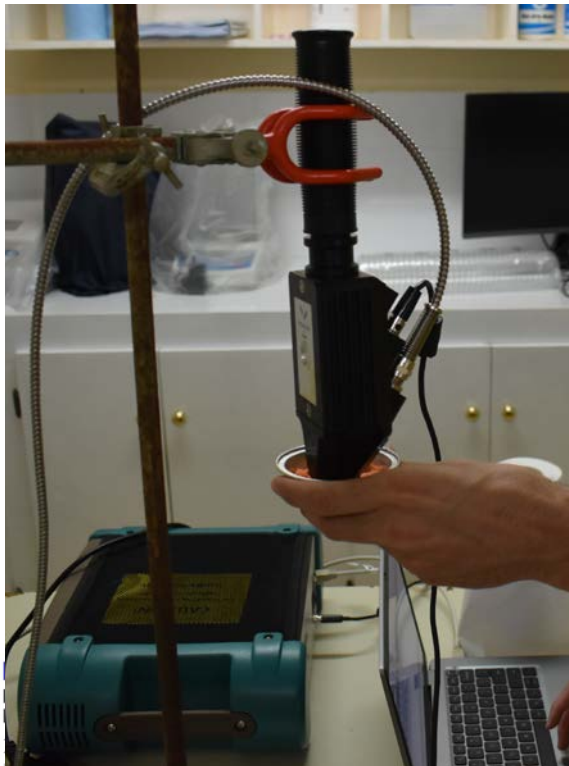
Very oxidized sample

Grinded root scan measure

- Clean the glass after saving and before starting the next sample

  - First use a wet tissue or piece of toilet paper

  - Then dry with dry tissue or toilet paper

  - Wait a few second and check the glass doesn't look foggy

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Finding the file were the samples are saved

- If you don't remember if you saved correctly a sample, or you want to verify the name of a sample the location of the saved spectra is:

  - C:/ProgramData/ASD/IndicoPro/Projects

  - Then search the name of your current project and you will find all the ASD files you have recorded

  - The icon of the folder named ProgramData is more translucid compared to the rest, but that is not a problem, it is a normal folder.

    - If you don't find you will have to allow to show hidden folders