ATRAZINE AND METOLACHLOR IN SOIL
Sample Preparation

1. Intended Use
For the detection of Atrazine and Metolachlor in soil.

2. **Range of Detection**
Atrazine: 15-750 ppb; Metolachlor: 15-750 ppb

3. Materials Required (Not Provided)
Reciprocating shaker
Plastic bottles (HDPE or PP, 60 mL capacity)
Sample containers
100mL graduated cylinder
50mL polypropylene conical tubes or bottles
Serological pipettes
Shaker
Scale or balance
Apparatus for grinding and mixing soil
Methanol (pesticide grade)
Distilled or deionized water
ABRAXIS® Atrazine ELISA Kit (PN 520005)
Centrifuge (optional)
Filters (optional)

4. Sample Preparation
Break up large soil clumps and mix thoroughly to uniformity with a mixer, mortar and pestle or by hand with a spatula. Moist samples should be air dried at room temperature by spreading soil in a thin layer for up 24 hours prior to mixing.

5. Extraction Solution
Methanol/water 3:1 (3 parts methanol plus 1 part water).

6. Extraction Procedure
Extraction times as short as 10 minutes give useful results. Extraction times should be chosen depending on the objective of the study, especially when high concentrations are expected and when time constraints are critical. The following protocol is recommended when assessing ppb levels while extracting most of the pesticide from the soil for analysis.

6.1. Label soil collection bottles and extract collection vials.
6.2. Sampling:
  6.2.1. Remove the screw cap from the soil collector bottle and collect soil by weight using digital balance. Weigh 10 +/- 0.1 gram of soil into the bottle. Record the soil weight.
6.3. Extraction:
  6.3.1. Pour approximately 30 mL of the Extraction Solution into a graduated cylinder.
  6.3.2. Pour the contents of the tube into the bottle. Screw the cap on tightly.
  6.3.3. Position the sample bottle on its side and shake vigorously and continuously for 30 minutes at approximately 200 cycles/min.
  6.3.4. Allow sample to sit overnight
  6.3.5. Shake sample vigorously for 30 minutes.
  6.3.6. Position the collection/extraction bottle upright and allow the mixture to settle at least five

minutes.

6.4. Filtration
- 6.4.1. Remove the screw cap and pour about two (2) mL of the soil/extraction solution mixture into the bottom container of filter device (available form Abraxis).
- 6.4.2. Attach the plunger rod containing the filter to the bottom holder of the filter device.
- 6.4.3. Apply slight pressure to the plunger handle. The filtrate will begin to flow more quickly as gentle pressure is continuously applied.
- 6.4.4. Fill the filter container with vial with approximately 10 to 20 drops (0.5 to 1 mL). Cap the filter container. This amount of filtrate is sufficient to perform multiple replicate analyses with Abraxis Assays kits. The filter container will hold up to several mL of filtrate if additional extract volume is desired. The filtrate containing the extracted glyphosate should be transferred to glass vials with Teflon stoppers.

6.5. Alternative to Filtration
- 6.5.1. Allow sample to stand for about 10-15 minutes, and then remove 0.5-1.0 mL of the solution being careful as to not disturb the soil. Samples can also be centrifuged.
- 6.5.2. Store sample in glass vials with Teflon stoppers.

7. Dilution Procedure

Dilute the extract (at least 1:50) as follows with the appropriate Assay Sample Diluent or distilled water using serological pipets:

Dilution	dilution volumes
1:50	50 mL extract + 2.45 mL diluent
1:500	50 mL extract plus 25 mL diluent

8. Analysis

Analyze the diluted extract as the "sample" according to the package insert of the ABRAXIS® Atrazine, Metolachlor ELISA Assay.

9. Interpretation

Calculate the pesticide concentration in the soil by multiplying the assay result by the appropriate factors introduced by the procedure:

For a soil sample containing pesticide and weighing 10.0 grams, using a 1:50 dilution and giving an assay result of 2.5 ppb:

$$\text{Assay result (ppb)} \times \frac{\text{vol. Extract (mL)}}{\text{wt. of soil (g)}} \times \text{dilution factor*}$$

$$\text{Assay result (ppb)} \times \frac{30}{\text{wt. of soil (g)}} \times \text{dilution factor*} = \text{concentration of pesticide in soil (ppb)}$$

$$2.5 \text{ ppb} \times \frac{30}{10} \times 50^* = 375 \text{ ppb} = \text{concentration of pesticide in soil}$$

NOTE: If the assay result is labeled "nd" (non-detectable) or if the result is less than the concentration of STANDARD 1, do not multiply the result. Report the result for this sample as not detectable.

10. Expected Results

When soil samples are extracted according to the procedure described above, average recoveries for Atrazine 92%, Metolachlor 90%. However, recoveries of will depend on soil type, mechanism of retention of the pesticide, length of extraction period, etc.

11. For ordering or technical assistance contact

Gold Standard Diagnostics
124 Railroad Drive
Warminster, PA 18974
WEB: www.abraxiskits.com

Phone: (215) 357 3911
Fax: (215) 357 5232
Ordering: info.abraxis@us.goldstandarddiagnostics.com
Technical Support: support.abraxis@us.goldstandarddiagnostics.com

Date this Technical Bulletin is effective: 18MAY2022 Version: 01