



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

4

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Memorandum

To: Board of Pesticides Control
From: Pamela J Bryer, Ph.D. | Pesticides Toxicologist
Subject: Introduction of laboratory equipment for pesticide analyses
Date: October 8, 2021

As part of the funding associated with the state's cooperative agreement with EPA, the BPC has purchased a piece of analytical equipment. EPA periodically makes available funds for equipment purchase to the BPC. Previously, these monies have been used to purchase disposable sampling equipment or passed through to other agencies due to a lack of a state laboratory able to conduct pesticide analyses. Prior to 2012, funds were dispersed to the University of Maine, Department of Food Science Food and Chemical Safety Laboratory and to the Health and Environmental Testing Laboratory. EPA stipulates that the money is not to be used for pesticide analyses but as capacity building for pesticide analytical testing. As such, staff identified a piece of equipment that expands the ability to test surface water samples but does not require highly technical personnel for its use.

System specifics

The Caas Cube is manufactured by Eurofins Abraxis. It is a fully contained system that automates the ELISA analysis. All of the pipetting, reagent addition, timing, rinsing, calibration, and absorption reading is done without aid after the samples have been added. The unit is approximately two by two feet, does not require plumbed drainage or compressed gasses, and plugs into standard electrical outlets.

The Caas Cube is an automated ELISA system that has the potential to analyze various chemicals and it currently includes kits that have been optimized for glyphosate. Going forward with this equipment the BPC will have capacity to increase

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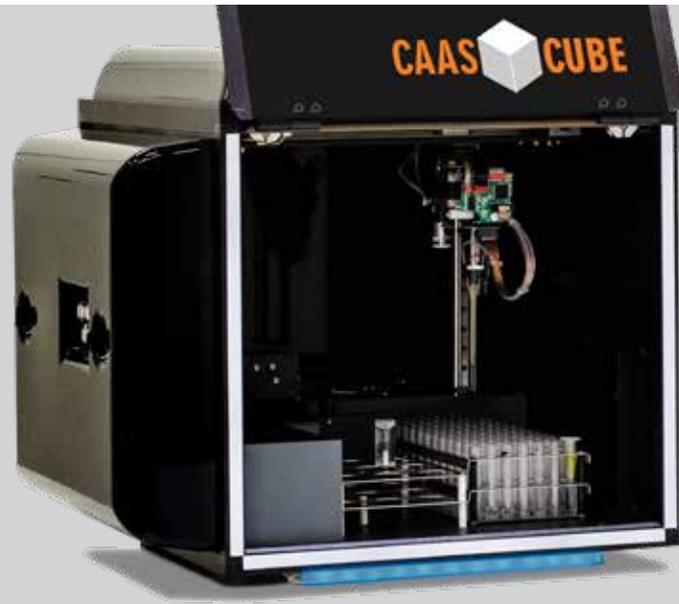
the number of water samples tested for glyphosate due to the much lower per-sample cost the Caas Cube allows. Methods have been worked out for glyphosate in various matrices, like oats, urine, soil, and the system has been used by producers to test commodities to ensure tolerance violations do not occur. Atrazine is another currently available pesticide for use in this system. Additional pesticides will be available with time as the Eurofins technical staff are able to validate the methods. The Eurofins website lists several pesticides that are likely to be available for the Caas Cube shortly, including: 2,4-D, alachlor, azoxystrobin, DDT/DDE, diuron, neonicotinoids (as a group), metolachlor, OPs and carbamates (as a group), pyrethroids (as a group), and trifluralin.

Quality assurance

The BPC is held to rigorous standards for analytical work by EPA. Staff are currently working on the standard operating procedures (SOP) and a quality assurance project plan (QAPP) for submission to EPA Region 1 for review. It is important to note that it would be inappropriate to take enforcement actions based on analyses performed by this system. Enforcement sampling requires a different degree of accuracy and precision than is available from the test method utilized by this system. However, the detection limit for glyphosate in drinking water using this system is still comparable to the laboratory we currently send our samples to. The combination of lower price per sample with detection limits equivalent to the currently contracted analytical laboratory makes this system ideal for wide area screening projects whose goals are related to environmental surveillance.

Current and future activities

In September, as part of the purchase agreement, Eurofins Abraxis came to Augusta to set up the instrument and three BPC staff had the opportunity for a day long hands-on training event. Following acceptance of the QAPP by EPA Region 1, staff will be able to implement water quality studies focusing on glyphosate. As testing kits become available, additional analytes may be utilized.



“CAAS Cube” Modular, Fully-Automated ELISA + CLIA Analysis System

CAAS Cube Single Plate Analyzer

CAAS Cube is a fully automated, single plate analysis system with spectrophotometric and fluorescent reading options. Its compact, modular design allows several units to be networked to a single computer for data analysis, conserving bench space and allowing the system to expand with lab testing requirements. CAAS Cube comes standard with a no-spill linear shaker for speeds up to 900 RPM as well as a forced convection incubator for even heating with no edge effect.

Applications

- Water quality analysis
- Waste water analysis
- Food & agriculture testing
- Veterinary analysis
- Environmental testing
- Life science research

CAAS Cube’s open, fully customizable software with multi-language support permits use of pre-programmed or custom assays.

The fully automated CAAS Cube analyzer helps labs of all sizes expand their sample testing capacities and add new analyses.

Key Features & Benefits

- Compact, modular design conserves bench space and allows the system to expand as your testing needs increase
- Allows up to 3 analytes to be scheduled and run during normal lab downtime
- Multiplex up to 3 analytes to save time
- Reduces operator associated testing and calculation errors
- Easy maintenance
- Large field-based support team
- Status light visible across room

“CAAS Cube” Modular, Fully-Automated ELISA + CLIA Analysis System



Ordering Information

CAAS Cube System Package includes:

- CAAS Cube analyzer
- Installation and on-site training (up to 3 operators)
- Training supplies
- 1 year CAAS Cube service contract
- Netbook with MS Windows to serve as user interface

Related Products & Services

- ELISA plate kits
- Standards and quality control materials
- Sample collection materials
- Sample preparation reagents and accessories
- Annual service contracts
- Refresher and new operator training

Available System Upgrades and Options

- Continuation of service contract after first year
- CLIA reader addition (ELISA only is standard configuration) - detection type: glow, spectral range 300-500 nm, dark count
- Glyphosate analysis package; includes equipment required for off-line, pre-analysis sample derivatization

Product Specifications

Dimensions (L x W x H)	48 cm x 53 cm x 56 cm (19 in x 21 in x 22 in)
Weight	27 kg (60 lb)
Dispensing volume range	1 µL to 300 µL
Maximum test positions	48*
Reagent positions	24 (bottle diameter 12-35 mm) + 3 external wash bottle positions
Calculation mode	Point to point, linear regression, cubic spline, 4PL, 5 PL, Lin-Lin, Lin-Log, Log-Log
Absorbance	405, 450, 490, 550 and 630 nm (custom wavelengths also available)
Number of wash heads/probes	1 probe, dual needle
Assay vessel compatibility	Standard 96 well assay plates and strips
Incubation temperature control	Ambient to 40 °C
Electrical specifications	100 – 265 VAC, 50/60 Hz; 120 WATT max power
Compliance	CE Mark
Networking and data output	Bi-directional, RS232, USB, TCP/IP, LIS/LIMS compatible
Linear shaker speed	Up to 900 RPM

*Rack accommodates 15 mm diameter standard & sample vials up to 93 mm tall

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