

*Thematic working section
Monitoring of RBSP*

Multiresidue methods

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Characteristics of traditional methods on target analytes

- High Specificity
- High Sensitivity (high S/N)
- We look for a specific pre-determined analyte or class of analytes
- No other compounds determined, neither derivatives, new analogues compounds, nor metabolites

Limitations of multiresidue/screening methods

- No specificity
- Long total analytical time

Need for:

- High probability of Identification (no false positive)
- Sufficient Sensitivity (no false negative)
- High productivity

RBSP monitoring: Need for Multiresidue methods

- **Semivolatile compounds: GC-MS**
 - Innovations
 - **GC X GC** (multidimensional chromatography): resolution of complex mixture
 - **GC-MS-MS**: sensitivity and specificity
- **Polar compounds: LC-MS**
 - Innovations:
 - **UPLC**: high efficiency of chromatographic peaks
 - **High speed scanning quadrupole MS**: high number of analytes in short times, high productivity
 - **High resolution MS** (TOF, Orbitrap) for unknown identification

UPLC-MS-MS : 250 pesticides in 15 min

500 MS-MS transitions acquired

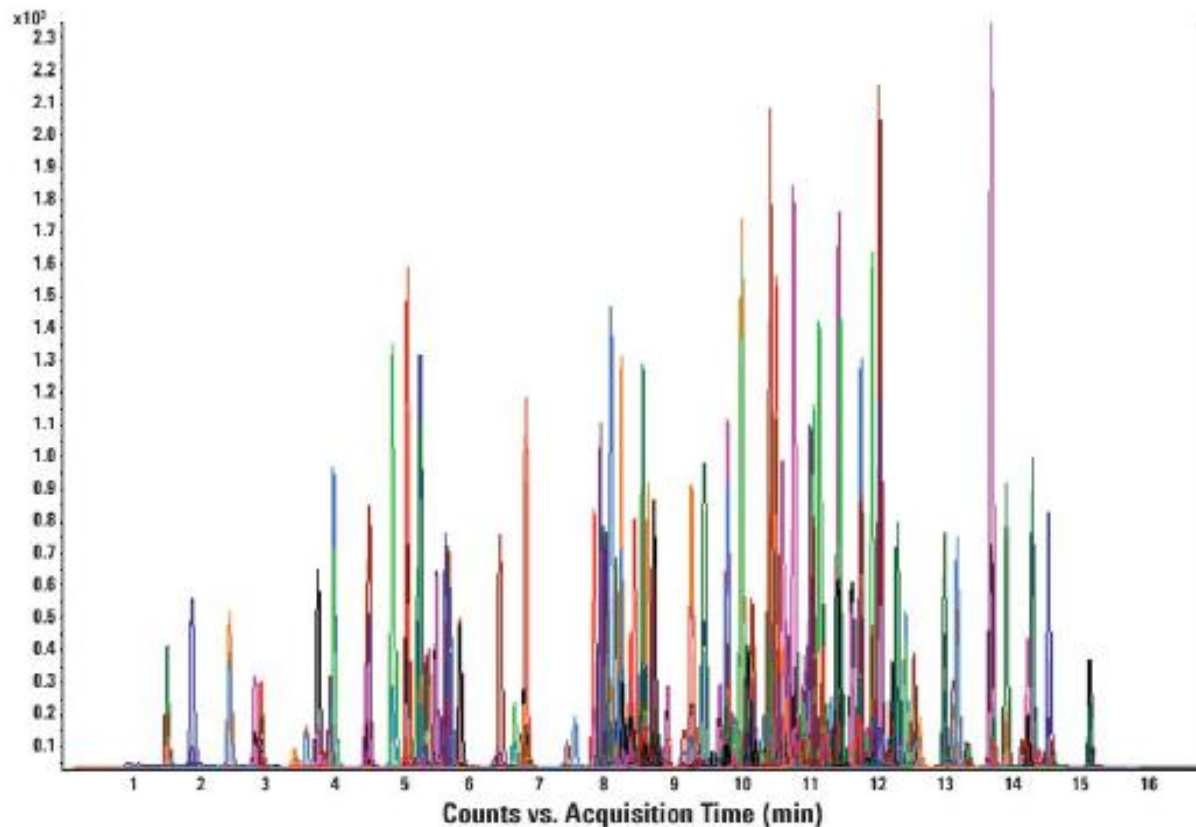
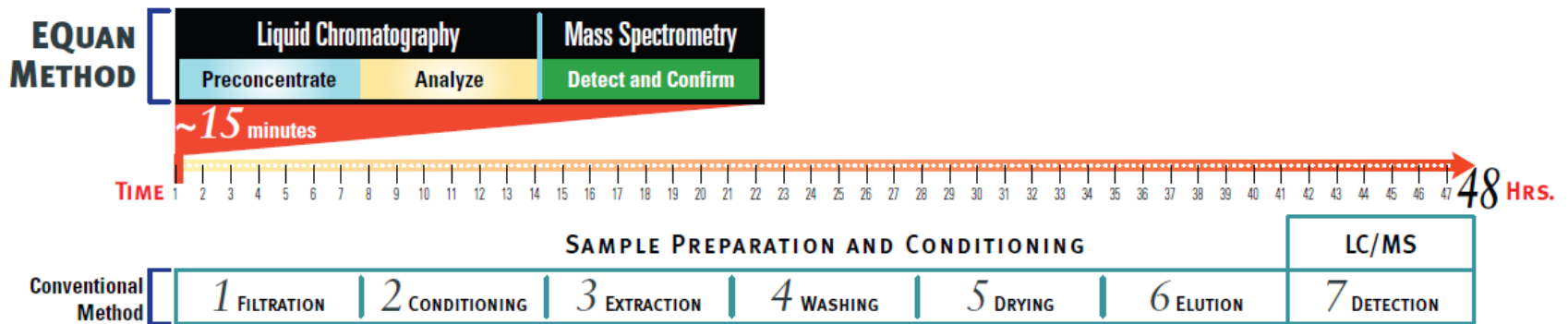
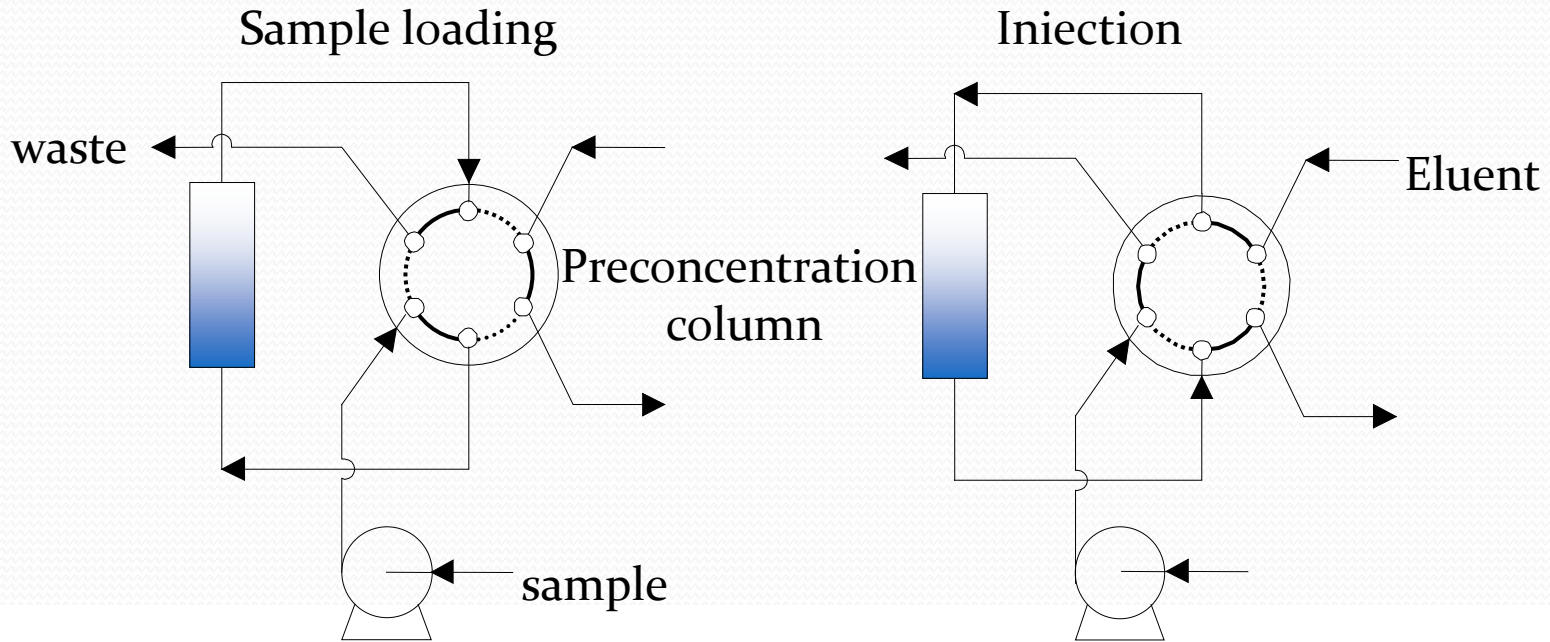


Figure 3: Dynamic MRM method does not require time segments. Extracted ion chromatogram of a 250 pesticide mix spiked into tap water (500 total transitions, 2.5 pg on-column) using a dynamic MRM method run on a 1290 Infinity LC and a 6460 Triple Quadrupole LC/MS system with Agilent Jet Stream technology.

High productivity and automation for routine monitoring of water: the on-line preconcentration



Open issues

- Availability of advanced instruments in local Environmental Agencies?
- Need for reference labs at basin/national/EU levels?
- Availability of validated methods with sufficient LOQs
- Whole water analysis and SPM

Further developments

- Implementation of Effect Directed Analysis at basin level: starting from the evidence of ecological/ ecotoxicological effects, identification of the responsible pollutant