



## AEIC 2007 Spring Meeting Minutes

April 25-26, 2007

Durham, NC

As recorded by: P.L. Hunst (Dow AgroSciences), Secretary of the AEIC

### AEIC Business Meeting

Secretary's Minutes of Fall 2006 Meeting: Motion was made, seconded and positively voted to accept the Secretary's minutes as published in Fall, 2006.

### Treasurer's Report (D. Layton):

Beginning Balance	\$13637	
Projected Dues	8300	
Expenditures	Projected	Actual
Scientific Paper	\$ 4000	\$ 4000
Wire Transfer Fee		
DE Franchise Tax	25	25
ANSI/ISO	2750	
Board Meeting	100	
Spring Meeting Expenses	1000	
Website	500	
Bank Service Charge		
Fall Meeting Expenses	1000	
Reprints	200	
Subscriptions	100	
Miscellaneous	100	
TOTAL	9875	4025
Projected Balance	12062	
Cert. of Deposit	10000	
Interest on Cert. of Deposit	500	
	22562	19862

Motion was made, seconded and positively voted to approve the Treasurer's report.

Membership Update (D. Layton):

Membership Profile—

Large Companies (>50 employees)	13
Small Companies (<50 employees)	11
Individual Members	2
Associate Members	<u>2</u>
TOTAL	28

AEIC Website Update (P. Hunst): The AEIC webmaster is retiring his “side” webmaster business to spend more time with his family. He is currently configuring the website so that the Secretary can make updates. However, AEIC is interested in finding another webmaster/company to maintain the site and asks members to have interested parties contact the Secretary ([plhunst@dow.com](mailto:plhunst@dow.com)) with bids for the work.

Codex CCMAS (R. Shillito): Codex handles food and food trade and has been convinced that they should be involved in the detection of GM food products. In March, 2007, Codex held a meeting entitled “Consideration of the Methods for the Detection and Identification of Foods Derived from Biotechnology: General Approach and Criteria for Methods”. The paper from this meeting contains much of the information of the AEIC PCR paper and a fair amount of the EU regulations also. The US needs to ascertain that the paper contains criteria that companies can live with. The paper will most likely be adopted by Codex in 2008. More work needs to be done on the protein detection methods section. Comments on the paper can be submitted to Codex via Don Kendall (USDA GIPSA), AOCS, ILSI or CropLife International. The Codex interfaces with the International Standards Committee. AEIC started working with the Technical Advisory Group (TAG) to Standards Committee about 5 years ago. The standards are now coming up for review. To comment on the standards, commenters should request to be added to the e-mail list for the standards by contacting Gina Clapper (AOCS).

ISO/TC 34 (G. Clapper): The administration of TC 34 was “open” and the US attempted to gain the financial support needed to take over the administration. The US was not successful, however, and the administration of TC 34 has passed to AFNOR/ABNT (France/Brazil). Ron Jenkins (USDA GIPSA) has been selected as the US representative for the ad hoc committee for the work item proposal. The standards in the proposal are general, i.e., an “umbrella-like” policy. Annexes are not considered so all methods that have been received have been appended to the work item. The JRC submitted three methods which were appended. These are methods from private companies with the business information and patent information removed (Mon863, TC1507 and H7 sugarbeet). The ad hoc committee is assembling comments on the methods. There is also a proposed subcommittee for biomarkers in seeds which has gone

to the Technical Management Board. M. Sussman (USDA AMS) has reworked the scope of the subcommittee and USDA AMS will provide partial funding for the effort. The sampling standard has been removed from the ISO work item list. The US has submitted a work item for an international sampling workshop. The standard for protein-based methods is currently up for review and Gina is looking for a leader for this effort. Gina is currently gathering comments and investigating as to whether an extension can be obtained beyond the current June date.

First World GMO Conference (R. Jenkins): The EU is organizing this conference which is to be held June 24-27, 2008 in Como, Italy. Information on the conference can be obtained from the website at [//gmoconference.jrc.it/](http://gmoconference.jrc.it/).

The topics of the conference include sampling, analytical tools/procedures and consistency of test results. There are three major themes: a) method requirements and applications; b) method developments and applications; and c) accreditation—quality assurance. Plenary speakers have been identified and these include Rob Horsch (Bill and Melinda Gates Foundation), Nick Kalaitzandonakes (University of Missouri), D. Burke (UK) and K. Sinemus. Within each theme, there will be two speakers and then breakout sessions. AEIC may want to consider giving a presentation during one of the breakout sessions. The proceedings of the meeting will be published. The call for abstracts and registration will occur in September, 2007 and end in March, 2008. The organizers are anticipating 600-800 paying attendees.

Protein Paper (D. Grothaus): The paper has eight authors from AEIC (D. Grothaus, M. Bandla, T. Currier, R. Giroux, R. Jenkins, M. Lipp, G. Shan, J. Stave and V. Pantella) and was accepted for publication in the Journal of AOAC in 2006 (Grothaus, D., et al., 2006. Immunoassay as an analytical tool in agricultural biotechnology. J. AOAC 89(4): 913-928). A PDF of the original article has been obtained and Dave will send it to the AEIC Secretary for posting on the website. Summary articles have been prepared for the newsletters of AOCS, AACC and AOAC. Gina distributed copies of the AOCS newsletter article (Pantella, V. 2007. Testing oilseeds for GMOs. AOCS Inform 18 (3): 154-156).

AEIC Brochure (D. Layton): Dean has put together a draft brochure for membership review (copies distributed at the meeting). Dean would like all comments back to him by May 15. The intent of the brochure is a “leave behind” after presentations or as a handout at member booths at trade shows. A PDF of the brochure will also be available on the AEIC website. Suggestions for the brochure included:

- Add how to become a member
- Add work on ISO
- Add a double helix as a graphic to represent DNA detection
  - Suggest to make the “I” of AEIC a double helix
  - Could also make the helix a watermark
- Place the AEIC web address on the front of the brochure

AEIC 2007 Goals/Activities Related to Its Mission (G. Clapper):

For the Fall 2007 Meeting, OMIC USA will host the meeting in Portland, Oregon.

It was suggested that AEIC plan to present at the GMO Conference in Como, Italy in 2008. The presentation could be a Powerpoint presentation of the recently published protein paper and the PCR paper. Dave Grothaus and Ray Shillito will coordinate this. It was suggested that the presentation should be previewed at the AEIC Fall 2007 meeting.

There was a discussion of the comparability of protein-based and DNA-based detection methods. The question was what could AEIC contribute? A suggestion was to show how the methods are similar and dissimilar. The goal would be to illuminate that the different methodologies look at different target molecules but that they are both accurate for what they measure. However, AEIC should not support the concept of copy numbers but rather, show the problem empirically. How to accomplish this: a) have several labs do a ring study and then compile results; b) use GIPSA data? or c) do four case studies of different amount of GM events in a barge. The problem with the GIPSA data is that it is unknown what the various labs used as reference material. It was suggested that a subgroup should put together a proposal and present it at the next meeting. The subgroup of volunteers is Chuck Mihaliak, Ray Shillito, Frank Spiegelhalter, Dean Layton, Tim Lawruk, Guomin Shan and Ron Jenkins.

Training opportunities: There may be a training course in Viet Nam at the end of 2007. There is also a possibility of a course for Central and northern South America (Costa Rica, Colombia, Mexico) which would be held in Guatemala or Mexico.

Comparing RT-PCR machines: Differences are known between the different machines but are not published. It was suggested that AEIC should have the different manufacturers talk at the next meeting.

Suggested topics for Fall Meeting 2007:

- Grain sampling

- PCR machines

- Varietal identification

- Plant Variety Protection Act update

  - Legal aspects

- Out of place products (adventitious presence)

- Insurance programs for farmers based on biotech

  - John Deere has announced a program for low-linolenic soy

## NEW MEMBER PROFILE

OMIC USA (J. Lupean, OMIC USA): OMIC is an acronym for Overseas Merchandise Inspection Company which was established in 1954 in Japan. There are 360 employees globally. The company has 41 stockholders. The businesses include quality assurance, pre-shipment inspection, supervision of vessel loading, etc. Offices are located in the EU, North America and Australia. Lab facilities are located in Portland, OR, Tokyo, Japan, Bangkok, Thailand, and Melbourne, Australia. OMIC USA opened in 1955 with a branch in San Francisco. In 1959, an inspection branch was opened in Portland, OR. The lab in Portland, OR was opened in 1993 and is a registered company in Oregon. In 2004, the lab relocated to new facilities to gain more space. The lab currently has 24 staff which are mainly chemists using state-of-the-art technology. The mission of the lab is to assist traders exporting products overseas. These exporters handle food, grain, beans, oilseeds, feed grains and feedstuff pellets, fruits and vegetables, tea and coffee. The lab also assists US companies importing food products into the US. The analytical services provided for the food industry include: FDA nutritional label analysis, pesticide residue analysis, pathogen testing, mycotoxin testing, food additives testing and GMO analysis. The lab has also helped in analyzing soil samples to assist farmers in assessing soil for pesticides when rotating crops and also analyzing for drift—one of the most important issues facing agriculture. The lab contains four departments: Residue, Nutrition, DNA and Microbiology. OMIC USA lab has developed a multi-residue method which is capable of determining many pesticide residues in one analysis. It is robust enough to cover many types of commodities as well as being sensitive. The challenge is keeping up with the number of new pesticides being released as well as providing analysis for the pesticides on the mandatory list which includes pesticides used in the past (DDT). The lab started rice variety identification in 1999 utilizing RAPD qualitative testing initially and changing to micro-satellite analysis in 2001. It is mandatory in Japan that all rice varieties be identified. A single sequence repeat (SSR) method is used to confirm variety but is not used for identification. The OMIC lab has the following accreditations:

- ISO2001
- ISO17025
- AACC
- ORELAP/NELAC
- USDA
- MHLW
- MAFF
- KFDA

The lab participates in proficiency testing programs of AOAC and USDA GIPSA. The lab is currently working on GLP standards and invites AEIC member companies to work with them in the future.

## PRESENTATIONS

Cottonseed (T. Wedegaertner, Cotton, Inc.): Cotton, Inc. promotes the research and marketing of US cotton through increasing the demand for and profitability of cotton through research and promotion. Cotton, Inc. is funded by US cotton growers and cotton importers (e.g., Wal-Mart, etc.). The biggest producers of cotton in the world are China (27%), US (19%), India (18%). In the US, the cotton belt stretches from California to the Carolinas and Virginia. Cotton acres will be reduced in the US due to the high price of corn. Cotton is generally planted in the US in May and it is projected that 12 million acres will be planted in 2007. It requires 110 days to achieve the first boll opening and harvest is generally in October. At harvest, the cotton bolls are put in modules and transported to the gins. Gins, on average, each handle about 20,000 – 30,000 bales and there are about 900 gins in the cotton belt. Ginning of cotton is still the same basic process that was developed 200 years ago. There are 1.3 pounds of seed produced for very pound of cotton fiber. In 1993, there were 768 pounds of seed/bale of cotton. By 2004, there were 600 pounds of seed/bale. This deficit is accounted for as an increase in lint yield at the expense of seed yield. The reduced amount of seed is going to oil and more is being fed to dairy cattle. As a feed, cottonseed is high in protein and fiber for the cattle. Cottonseed products include oil (16%), hulls (27%), meal (46%), linters (8%) and waste (3%). The cottonseed oil is primarily used in snack foods such as potato chips. However, it is being replaced by high oleic sunflower oil. Crisco brand shortening derived its name from CRystallized Cottonseed Oil. Cotton linters are the fuzz on the seed and are 100% cellulose. They are used in cellulose derivatives such as acetates, carboxymethylcellulose, paper, money, LCD flat panel TV screens, thickeners, cellulose gums, smokeless gunpowder, acrylics and edible casings for hot dogs and sausage. Free fatty acid content in seed is a problem since the level will cause the seed to germinate prematurely. Another issue for seed is gossypol. There are a number of efforts to reduce or eliminate it from seed. RNAi is one technology being explored to genetically remove from seed but leave the fatty acids in the plants. Gossypol has anti-cancer properties and anti-oxidant properties, both of which are being researched. An ELISA kit has been developed and is used in cotton breeding, food/feed analysis and insect management (way to look at insect populations and determine if they are feeding on cotton). EasiFlo cottonseed is made by applying a light coating of starch to the seed. Biodiesel from cottonseed is also being explored with mini-mills springing up. These mills use crude oil obtained by mechanical pressing of the seed. Approximately 200 pounds of oil is obtained from a ton of cottonseed. Discarding of the waste material is problematic although some is being fed to dairy cattle. Cottonseed, such as the EasiFlo seed, is being used as range ruminant feed since only deer will eat it and not other wildlife such as raccoons. Gin trash is used in hydro-mulch for hydro-seeding of lawns and stove pellets. Boll carpels have been used as a replacement for sawdust in decking products.

Cotton Supply Chain (A. Simpson, Bayer CropScience): Bayer is the second largest cottonseed company in the world with 29% market share in the US, 22% in Brazil, 38% in Greece, 28% in Spain and 28% Turkey. Bayer's mission in cotton is to provide highest quality products possible through superior genetics, seed quality, agronomic support and marketing programs such as FiberMax. Their vision is to be the best in cottonseed quality by 2009. The cotton supply chain is responsible for managing seed inventory from the initial seed increases through the delivery to the distributor to ensure quality and supply. The components of this chain include 1) counter season production in Costa Rica (November through April), 2) parent seed production in Arizona (April through November), 3) field production in California, Arizona, Texas and Mississippi (April through November), and 4) plant operation (processing/conditioning) in Texas and California. In the counter season production, 400 acres are planted of different varieties. Bayer is currently building a quality assurance lab in Costa Rica to do purity testing for the desired trait, adventitious presence testing for undesired trait(s), zygosity testing, warm/cool germination testing. By having a lab in Costa Rica, the turn around time will be shortened. Parent seed includes pre-foundation seed to foundation seed. Quality testing is performed and typically 750 units of seed are produced. Field production usually encompasses 50,000 acres/year and Bayer contracts with about 100 growers and use 40 gins in harvesting. Approximately 18,000 units of commercial seed are produced. In the processing/conditioning, lint is taken off from the seed, cleaned and placed in commercial bags. Seed is de-linted either by the use of sulfuric acid or hydrogen chloride gas. In 2007, Bayer is investing \$3 million to improve their processing/conditioning plants. The main quality assurance lab is located in Lubbock, Texas and is a partner for all departments—not an enforcement arm. The Business Analysis group performs forecasting for inventories and also manages processing schedules by variety and orders.

VipCot (D. O'Reilly, Syngenta): In 2006, 87% of cotton planted in the US was transgenic (insect resistant and herbicide tolerant). Insect resistance is against the major lepidopteran pests (bollworms, budworm, pink bollworm) and secondary pests (yellow striped armyworm, fall armyworm and loopers). The drivers for the development and use of transgenic cotton are a) the pest are cryptic, b) pests have several flights/season, c) growers often sprayed 6-8 times/season to control pests, and d) pests have increasing levels of resistance to chemical insecticides. The current transgenic cotton products on the market have a different insecticidal ingredients (*Bt* proteins) which have no cross-resistance with chemicals. The insecticidal proteins are expressed throughout the plant which is necessary in order to control the cryptic pests and the proteins are expressed throughout the season providing season long control. The current transgenic cotton products on the market are Bollgard, Bollgard II and Widestrike. All overlap by containing the *Bt* protein known as Cry1Ac. VipCot by Syngenta is a combined trait product (i.e., "stack") of *Bt* VIP3A x Cry1Ab and herbicide tolerance. VIP3A is broad spectrum in its activity and has overlapping as well as different specificities with Cry1Ab. VIP3A acts on different targets in

the insect. VIP stands for vegetative insecticidal protein which is produced when the bacteria are growing vegetatively. Other Cry proteins, such as Cry1Ab, are produced during the stationary phase of the bacterial life cycle. VIP3A has no sequence homology with the Cry proteins and the protein structure is predicted to be entirely dissimilar to the Cry proteins. Binding of the VIP3A leads to pore formation in the midgut of the target insects, however, the pores are structurally/functionally different from the pores formed by the Cry proteins. VIP3A does not bind to the same receptors that the Cry proteins do so the risk of developing cross-resistance is low. Cry toxin-resistant strains of *Heliothis virescens* and *Heliothis zea* show no resistance to VIP3A. The combined trait product consists of events COT102 (VIP3A) x COT67B (Cry1Ab). Efficacy trials conducted in 2006 showed that the combined trait product exhibited very good control of *H. virescens* vs. the single event parents. For insect resistance management (IRM), a high dose and refuge strategy is being sought (same as for other insect resistant cotton). This strategy encompasses a) that a suitable refuge must be available, b) the refuge provides susceptible insects, c) the susceptible insects mate with resistant insects, and d) the resulting heterozygotes are killed by the high dose of the insecticidal proteins. The premise is that resistant alleles do not accumulate in a population and that they are recessive. A high dose is defined as 25 times the concentration needed to kill susceptible larvae. EPA has established methods for determining high dose of a product. A registrant must show high dose by 2 of the 5 recommended methods. Syngenta has shown high dose via 3 of the 5 methods. The VIP3A Section 3 registration package was submitted to EPA BPPD at the end of 2006. Registration is expected in time for a 2008 launch.

Method Evaluation for Plant-Incorporated Protectants (PIPs) (C. Etsitty, EPA OPP Environmental Science Center): EPA's forthcoming work for methods evaluation includes conditionally registered PIPs, EUP PIPs and combined trait PIPs (stacked). The guidelines for analytical methods for plants are contained in OPPTS 885.2300. Verification refers to the registered analytical procedure whereas validation refers to an alternative analytical procedure proposed by the applicant for use. EPA engages in verification rather than validation. The residue chemistry guideline (OPPTS 860.1340) outlines the following procedure: a) develop a detection method, b) method is independently validated, c) EPA verifies independent laboratory validation. The challenge is that the enforcement methods are for chemicals rather than biologicals and also establishing a method verification process. The current process for verification is 1) BPPD performs risk assessment of PIP and method forwarded for verification; 2) a lab paper review is performed (about 6 weeks time but resources are limited); 3) study protocol is developed; 4) study conducted (1-6 weeks); and 5) report sent to EPA BPPD (4 weeks). In the lab paper review, the actual study conditions are assessed such as specificity of procedure (equipment required), stability of the sample solution (commercially available), intermediate precision (different days, analysts, equipment, reagents). A case study was conducted on the verification of a Cry1F assay. The assay method had been independently validated and



RSD, LOD and LOQ were determined. The consumables used in the method were commercially available. In general for all methods that have been received the following general list of problems have been encountered:

- Validation, not verification
- Not written in a stepwise format
- Spike matrix or not spike at all
- Event specific materials not commercially available
- Validating GIPSA-validated kit
- Equipment deviation
- Unacceptable results for controls
- No statistical endpoints for PIPs (not acceptable levels quantified)

EPA has the following recommendations:

- Improved guidance
- Verification focus for methods
- Institute technical transfer panel (be able to discuss method with Registrant)
- Lab capacity articulated
- Types of methods: LFS, ELISA (worried about ability to detect stacks)
- Set statistical data endpoints for PIPs: RSD, LOD, LOQ
- Results communication

The EPA lab has made the following progress:

- QAPP and SOPs have been developed
- End-user focus: method verification
- Verifications in place: ELISA, RFS
- PIPs: single and stacked

*Uncertainty Associated with Sampling, Sample Preparation and Analytical Steps Used to Detect Biotech Attributes in Bulk Lots (T. Whitaker, USDA ARS):* Lots of grain have to meet certain specifications when transferring from seller to buyer. In testing lots for mycotoxins, there was found to be high uncertainty among 40 lots. The test procedure was examined (lot-→sample-→sample prep-→analysis-→test result). The error model was  $S_s^2 + S_{sp}^2 + S_a^2$ . It was found that when dealing with an attribute in a kernel and a high number of the kernels are negative, the sample accounts for 81% of the variability. It is important to know where the variability is since there are different costs associated with reducing the error. Variability leads to misclassification of lots. An evaluation model has been developed:

Sampling plan -> variability distribution -> seller's risk  
Buyer's risk  
Lots rejected  
Cost

For StarLink, can detect  $1/800 = 0.125\%$ . Looked at 3 lots of 800 kernels each and found that the concentration differed among the StarLink kernels. Some kernels were negative, some had one copy, some had two copies. Thus, the

situation was similar to the mycotoxin model. To determine the sampling uncertainty, the distribution among kernels had to be determined. The concentration in 1000 kernels was measured with the following results:

Mean = 13000 ppb

SD = 10843

Range = 0 to 45000 ppb

Thus, sampling contributes to 90% of the variability.

USDA GIPSA Proficiency Testing (R. Jenkins, USDA GIPSA): The USDA GIPSA Proficiency Program is voluntary and no fee is currently associated with it. Samples are distributed to participating labs twice per year and the samples consist of 6 corn and 3 soybean. The events that are analyzed for include:

Corn: T23, CBH351, MON810, GA21, E176, BT11, NK603, TC1507, MON863  
Soybean: CP4 EPSPS

The Proficiency Program has 155 participants (32 US and 123 outside the US). The majority of the participant labs use DNA-based testing and capabilities vary significantly. For the samples distributed in Oct06, 57 labs participated. Out of these labs, 19 performed qualitative testing only, 8 did quantitative testing only and 30 provided a combination of quantitative/qualitative results. All results are available for viewing on the USDA GIPSA website.

For rice LL601 and LL602, six labs (approved by Bayer) participated with samples being distributed once per month. The labs had 100% correct results.

Nanoparticle-Based Detection Platform for High Sensitivity Detection of Proteins and Nucleic Acids (U. Muller, Nanosphere): Gold nanoparticles are used as high sensitivity labels and have application to nucleic acid detection (direct multiplex SNP detection without PCR) and protein detection (biobarcode technology and antibody arrays). Particle technology is an old technology but making large particles is the challenge. The surface of the particles can be functionalized by adding DNA probes and using a multiplicity of detection modes (absorbance, surface-enhanced spectroscopy [SERS], conductivity, scatter analysis). Ten million photons can be generated out of a nanoparticle. Multiplex assays for DNA include a) release targets into a small volume of hybridization fluid, b) capture targets on an array, c) hybridize to nanoparticle probes, d) perform silver amplification, e) image scattered light by use of Verigene ID instrument. The barcode detection step consists of subtracting out two times the background to give a linear curve. For multiplex PCR-less SNP detection, a) the target specific nanoparticle probes attaches to wild-type genomic target, b) intermediate oligo (bound to wild type genomic target) binds to universal probe. The reactions are carried out in Verigene system (fluidics cartridge, Verigene APS, Verigene ID). This system has been used for determining predisposition to disease and in diagnostics (prenatal screening for cystic fibrosis). For protein detection,

biobarcode assay is a new addition. Antibody (with nucleic acid tail) is used to capture protein. The target is captured and then a nanoparticle with an antibody is added. Oligos are added which bind to the nanoparticle. The oligos are knocked off the nanoparticles and bound to a surface to be probed with another nanoparticle to resolve. The method gave >3 log improvement in detection limit in the PSA assay (test for prostate cancer). The method has also been used for troponin (heart attack marker), ADDLs, Tau (Alzheimer's), neuron specific peptides (traumatic brain injury). Nanosphere is currently looking for applications to agriculture.

*Invader DNA and RNA Analysis Chemistry (G. Donald, Third Wave Technologies):* Third Wave was founded in 1993 in Madison, WI and has 150 employees. The company develops and commercializes simple genetic analysis solutions for research and clinical applications in human health care. The company also has an agriculture component for non-human applications (mutations, SNP screening, high throughput genotyping, transgene detection, copy number determination, high throughput zygosity scoring). The Invader testing encompasses: a) adding the sample, b) adding the target specific probes, c) standard Invader reagents are added to a microtiter plate, d) isothermal incubation, e) read plate fluorescence. The components of the Invader kit include general reagents (cleavase enzyme, reaction buffer, FRET cassettes), specific reagents (oligos). During the reaction, the invasive structure is formed and this structure is recognized by the enzyme. The enzyme releases the 5' flap. During the secondary reaction, the 5' flap cycles, the structure is recognized by the enzyme and a fluorophore is released. The plate reader exports the data in an Excel format for easy manipulation. Assays are delivered pre-validated, are less sensitive to DNA contamination, inherently quantitative, amenable to high throughput automation and modest equipment costs are involved. The Invader Plus combines PCR and Invader chemistries and is amenable to automation in 96, 384, 1536 and 3456 well plates. Robotics are needed for the use of 384 formats and higher.

*New Detection Platform for GMO Screening (P. Daniel, Eppendorf):* DualChip GMO simultaneously screens multiple genetic elements which allows detection of registered GM events. It is one system---one solution. The system consists of the kits, thermomixer, silverquant and scanner. The silverquant process uses an array to capture the probe. The array is hybridized with the target molecule and the complex then binds biotin-DNA with gold conjugate. Silver precipitation is catalyzed by the gold particle. Silverquant is highly sensitive, robust, reproducible, compatible with a wide range of substrates (glass, plastic) and compatible with other technologies. DualChip GMO spotted arrays used spot morphology (100% QC) and exhibit absence of spotting contamination. The other reagents in DualChip GMO are GM specific element (promoters), plant specific element (maize, canola, soy) and contamination control element (CaMV). The system is event specific with a sensitivity of 0.1ng and a LOD of 0.1% with an accuracy rate of 95%. The DualChip is currently under a validation study

(inter-lab) with 12 labs in the EU. The advantages of the DualChip include 14 results per array, GM event specific, control reaction, easy handling, no time-consuming screening, innovative software, more transparency of GM events and upgradable technology. Each array costs \$75 and there are no event specific sequences on the arrays—all sequences are publicly available.