CIPAC

COLLABORATIVE INTERNATIONAL PESTICIDES ANALYTICAL COUNCIL LIMITED

Commission Internationale des Méthodes d'Analyse des Pesticides (CIMAP)

Minutes of the 63rd Annual meeting

The 63rd meeting was held on Wednesday 19th June 2019 at the TI-Forum located at the Thünen-BVL-Campus, Braunschweig, Germany.

Those attending
- Items 1 to 7 on 19th June: members, correspondents, observers and expert witnesses.
- Items 8 to 12 on 19th June and 20th June: members, correspondents and observers (representatives of industry and commercial laboratories, by special invitation only)

1. Welcome and introductory remarks
The chair, Mr R. Hänel, opened the 63rd CIPAC meeting, and welcomed all the participants.

2. Apologies
Apologies were received from: Brenda Itzel Checa Orrego, Anna Kashouli-Kouppari, Veronika Kmecl, Susan Marais, Albertus Martijn, Andrew Plumb, Juliana Schlosserova

3. Adoption of the agenda
The agenda was amended due to the request of two expert witnesses.
Item 4.8 (mancozeb) was put before item 4.1 (acephate) and item 4.9 (metribuzin) was put before item 4.2 (alpha-cypermethrin + chlorfenapyr).
Items 6.3 (A Comparison: Multianalyte Method Validation versus Product Method GLP Validation for Technical Active Ingredients by Mrs Mary Ellen McNally (5218)), 6.4 (Update on the development of a Multi-Active Method for the analysis of Formulated product active substances by Mr Jim Garvey (5219)), and 6.5 (CIPAC guidelines for the development and adoption of Multi Active Ingredient and Matrix Methods (MAIMM) for pesticides by Mr Olivier Pigeon (5222)) were deleted as they were already presented at the CIPAC symposium on 18th June.
Mr Hänel stressed the importance of being efficient as the agenda was very full. Furthermore he requested the expert witnesses to hand in all requests in time.

4. Reports of expert witnesses on collaborative trials

4.8 Mancozeb by Ms Junhua Song (5157, 5158)

Mrs Junhua Song presented the results of a large scale CIPAC collaborative trial for mancozeb in two TCs and three WP formulations. The large scale trial included method improvements resulting from the 62nd CIPAC annual meeting (Panama, 2018) about the temperature of the analytical column (<20°C), stability of the EBCD-anion (stable for 4 hrs at 20±2°C), and the identity test by adding MT 154 (differentiation of Zn-containing dithiocarbamates) and MT 165 (differentiation of Mancozeb with Maneb and zinc).
Furthermore the results of the proposed method were compared with CIPAC method 34 with good

results: 50.4%, 50.8%, and 50.8% by the CIPAC method and 50.4%, 50.6%, 50.8% by the proposed HPLC based method.
Eight laboratories participated in the trial, six from China, one from Europe, and one from Central-America. Unfortunately Lab 1 encountered custom problems resulting in a very late arrival of the samples (>1 month after shipment).
All participants used the recommended conditions during the trial with the exception of lab 3 which used a longer HPLC column (250 mm instead of 150 mm) and adjusted the flow rate accordingly (1.3 ml/min instead of 1.0 ml/min). The 4 hrs stability period was ignored by all participants as the sequence containing all samples was considerably longer than 7 hrs.
Remarks were received from the participating laboratories about the non-specificity of the HPLC method, about the use of non-certified reference material, changes in the injection sequence, and the use of 0.45 µm filters instead of 0.22 µm filters.
The data of all participants were included in the statistical evaluation (according to DIN ISO 5725) while applying the Cochrans' and Grubbs tests for stragglers or outliers. The results of lab 1 were identified as Cochran outliers for TC-1, TC-2, WP-1, and WP-2. Furthermore they were also identified as Grubbs stragglers for TC-1, WP-1, and WP-3.
Horwitz criteria were met for all five samples whether or not the outliers and stragglers were included. Unfortunately no HorRat values were reported.

The organizers recommended that the method should be accepted as a provisional CIPAC method.

The following comments were received from the meeting:

- Mr Manso remarked that the method will not work in combination with other actives. Ms Xu Mei replied that the method was developed for formulations that contain only mancozeb.
- Mr Haustein remarked that the HorRat value should be included in the report. Mr Hänel replied that due to an unforeseen communication error the document about the application of the Horrat value was not available from the website but that this omission soon would be rectified.
- Mrs Vinke remarked that only samples with high amounts of mancozeb were investigated and was curious whether formulations with lower amounts of mancozeb were investigated. This was not the case.

4.1 Acephate by Mr Rajendra Petkar (5207, 5208)

Mr Rajendra Petkar presented the results of a large scale CIPAC collaborative trial for acephate, performed in 2017, with two TCs and two SP formulations, based on internal standard calibration. 23 Laboratories offered to participate in the trial and 20 laboratories returned results. No information was given during the presentation neither about the method nor about method deviations of the participating laboratories. Statistical evaluation of the data was performed according to 'Guidelines for CIPAC Collaborative Study Procedures for Assessment of Performance of Analytical Methods'. Furthermore Cochrans' and Grubbs tests for stragglers or outliers were applied. Lab 14 was a Cochrans' outlier for TC-B, and lab 10 was a Cochrans' outlier for TC-A&B and a Grubbs outlier for SP-A&B. Lab 6 and 11 did not perform duplicate analysis on day 1 and day 2 and could therefore not be tested for Cochrans' outliers.
Horrat values were calculated and resulted in values of 0.27, 0.39, 1.3, and 1.3 for TC-A, TC-B, SP-A, and SP-B respectively (when including all outliers) and 0.27, 0.32, 0.76, and 0.83 (when excluding all outliers).

The organizers recommended that the method should be accepted as a provisional CIPAC method.

The following comments were received from the meeting:

- Mrs Nováková asked why an internal standard was used as the method performed equally well without the use of an internal standard. Mr Petkar confirmed the good results when not applying an internal standard based quantification, however he remarked that the method

should also be applicable for less experienced laboratories and that this was the reason why an internal standard based quantification was recommended, and also because of the recommendations of the Bureau of Standards of India.
- Another remark from the audience related to the sonification time of two minutes which was regarded to be too short. Mr Petkar remarked that this was done because of the rising temperature during sonification. However he agreed to put a notification in the method about the sonification time.
- Mrs Vinke asked why only 20 out of 23 laboratories returned results. Mr Petkar replied that these laboratories did not receive the samples in time due to custom regulations.

4.9 Metribuzin by Mr Bao Li (5193, 5194)

Mr Bao Li presented the results of a small scale CIPAC collaborative trial for metribuzin in one TC, and two SC, two WG, and two WP formulations. Four laboratories (all Chinese) participated in the trial. The method consisted of dissolvation in or extraction with acetone, followed by GC-FID separation using a DB-5 capillary column, and quantification using dibutyl phthalate as internal standard. The retention time of metribuzin was 4.1 min. and 4.9 min. for dibutyl phthalate. The participants did not report any deviations from the method. Statistical evaluation of the data was performed according to 'Guidelines for CIPAC Collaborative Study Procedures for Assessment of Performance of Analytical Methods'.
For all samples, the values of RSD_R were less than the Horwitz values. The Horrat values were 0.18, 0.73, 0.95, 0.17, 0.18, 0.35, and 0.30 for the TC, two SCs, two WGs, and two WPs respectively.

The organizers proposed to proceed with a large scale CIPAC collaborative trial.

The following comments were received from the meeting:
- Mr Wiese showed that Bayer had developed a similar method which deviated only slightly from the proposed method and their intention was to start a collaborative trial on similar formulations. The differences wer in the internal standard used and different solvent used for sample preparation.
- Mrs Carranza de Aguila remarked that the injection temperature of the method as proposed by Bayer was more suited.
- Mr Hänel remarked that both companies should work together in order to end up with one method which could be tested in the proposed large scale CIPAC collaborative trial.

4.2 alpha-cypermethrin + chlorfenapyr by Mrs Marie Baes (5220, 5221)

Mrs Marie Baes presented the results of a large scale CIPAC collaborative trial for the determination of alpha-cypermethrin and chlorfenapyr in two TCs and four LN formulations. The method consisted of a single extraction with heptane, adding of citric acid (to prevent epimerization) and dicyclohexyl phthalate (as I.S.), sonication for 30 min. (two min. for TC) followed by gas chromatographic separation on a capillary column (DB-1 or equivalent) and FID detection. Typical retention times were 4.77 min. for chlorfenapyr, 7.44 min. for alpha-cypermethrin cis I, 7.60 min. for alpha-cypermethrin cis II, and 5.92 for dicyclohexyl phthalate. Eighteen laboratories participated (from Asia, Europe, and Central-America), however the results of one laboratory were not useful and two laboratories did not return results in time. Comments of the participants related to the use of nitrogen gas instead of helium gas, strong epimerization (approx. 40%), too low peak areas, and deviating retention times. The use of nitrogen gas instead of helium gas did not influence the results and was added to the method as an alternative. The strong epimerization was observed by one laboratory only but did not influence the results. Small peak areas can be adjusted by injecting larger volumes. And retention times will differ from instrument to instrument. The given retention times are only indicative and show the order in which all components will elute.
Statistical evaluation of the data was performed according to the CIPAC guidelines and the data were tested for outliers (α 1%) and stragglers (α 5%). For chlorfenapyr one Cochrans' straggler was identified in TC_{CFP} 1 (lab 8), LN 3 (lab 8), and two Cochrans' stragglers were identified LN 4 (lab 8 and lab 11). %). For alpha-

cypermethrin one Cochrans' straggler was identified in LN 4 (lab 15). After elimination of the outliers the Horrat values for chlorfenapyr were 1.03, 1.21, 0.51, and 0.57 for TC_{CFP} 1, TC_{CFP} 2, LN 3 and LN 4 respectively. For alpha-cypermethrin the Horrat values were 2.10, 1.64, 0.87, 0.97, 0.76, and 0.68 for TCCFP 1, TCCFP 2, LN 1, LN 2, LN 3 and LN 4 respectively. With Horrat values between 1 and 2.1 the proposed method was not suited for the analysis of TC material. However, CIPAC methods already exist for alpha-cypermethrin TC and chlorfenapyr TC (CIPAC method 454/TC/(M)/3 and CIPAC method 570/TC/M/3).

The organizers recommend this method to be accepted as a provisional CIPAC method for the determination of alpha-cypermethrin and chlorfenapyr in LN formulations.

The following comments were received from the meeting:

- Mr Di Loreto remarked that one laboratory observed 40% epimerization; however the quantitative results were acceptable. Mrs Baes confirmed the acceptable results but said that no explanation could be found.
- Mr Perez Albela Vera asked whether the stability in solvents was investigated. Mrs Baes answered that the actives were stable in the used solvents, however she did not recommend storing the solvents in plastic containers, as solvent evaporation might occur even in tightly closed containers, resulting in incorrect active substance content.

4.3 Atrazine by Mr William Meyerhoffer (5215, 5216)

Mr Meyerhoffer presented the results of a large scale CIPAC collaborative trial for the determination of atrazine in two TCs and one WG and two SC formulations. The method consisted of a single extraction with acetone, adding of dipropyl phthalate (as I.S.), and sonication followed by gas chromatographic separation on a capillary column (DB-225 or equivalent) and FID detection. Typical retention times were approx. 9 min. for atrazine and approx. 6 min. for dipropyl phthalate. However a DB1701 type of capillary column can also be used.
Samples were sent to 16 participants in Europe, Asia, and the Americas and 15 participants returned results in time. The reported method deviations were deemed not to affect the analytical results. The data were subjected to Mandel's test and k and h outliers and/or stragglers were identified in TC-A (lab 3), TC-B (lab 16), WG-C (Lab 3), and SC-D (lab 13). Horwitz criteria were met for all five samples whether or not the outliers and stragglers were included. Unfortunately no HorRat values were reported.

The organizers recommended that the method should be accepted as a provisional CIPAC method with potential inclusion of DB-1701 capillary GC column as an alternative to the proposed DB-225 column.

The following comments were received from the meeting:

- Mrs Tissier remarked that one participant applied only the multimethod as proposed by Mr Garvey and Mrs Mary Ellen McNally.

4.4 Broflanilide by Mr Takeo Okochi (5213, 5214)

Mr Takeo Okochi presented the results of a large scale CIPAC collaborative trial for the determination of broflanilide in two TCs; and three WP formulations. The method consisted of a dilution (in case of the TC) or extraction (in case of the WP) with HPLC mobile phase (acetonitrile/water, 65/35 (v/v)) followed by sonication and broflanilide determination by reversed phase HPLC using UV detection at 254 nm and external standardization. The retention time for broflanilide is approx. 11.5 min.
23 Laboratories (Europe, the Americas, and Asia) participated in the trial and reported results. Three laboratories used an identical column as described in the method. The other participants used reversed phase C18 HPLC columns with the same dimensions and particle sizes but from different suppliers. One laboratory (lab 21) used a reversed phase C18 UPLC column. The participants reported several remarks mainly associated with changes in the flow-rate or injection volume. The

calculated results were subjected to the Cochrans' and Grubbs test. In TC-1 four Cochrans' outliers (lab 5, 10, 14, and 21) and two Grubbs outliers (20 and 21) were identified. In TC-2 three Cochrans' outliers (lab 10, 14, and 21), one Grubbs straggler (lab 21) and two Grubbs outliers (4 and 20) were identified. In WP-1 three Cochrans' outliers (lab 10, 14, and 20) and one Grubbs outliers (20) were identified. In WP-2 one Cochrans' outliers (lab 10) and one Grubbs outliers (20) were identified. And finally in WP-3 one Cochrans' outlier (20) was identified. However all data were retained as no obvious reasons existed for removing the outliers and stragglers. Including all stragglers and outliers the Horrat values were 0.85, 0.94, 0.68, 0.74, and 0.78 for TC-1, TC-2, WP-1, WP-2, and WP-3 respectively.

The organizers proposed that the method would be accepted as a provisional CIPAC method.

The following comments were received from the meeting:

- Mr Benke commented that this collaborative trial was an excellent example of a well-organized large scale CIPAC collaborative trial.

4.5 Etpyrafen by Ms Haixia Wang (5191, 5192)

Ms Haixia Wang presented the results of a large scale CIPAC collaborative trial for the determination of "etpyrafen" (transitional name as the proposed name was not accepted by ISO) in two TCs; and three SC formulations. The method consisted of a dilution with water (SC only) and acetonitrile, and sonication for three min. Identification of 'etpyrafen" was based on the infrared spectrum and the HPLC retention time. Quantitation was performed by reversed phase C18 HPLC (eluent: acetonitrile/0.05% phosphoric acid (800/200 (v/v))) and detection at 230 nm. The retention time of "etpyrafen" was approx. 8.4 min.
Samples were sent to 21 laboratories and 20 labs (from Europe, Asia, and North-America) returned results, using 11 different brands of reversed phase C18 HPLC columns, varying in length (100-250 mm), internal diameter (2.1-4.6 mm), and particle size (2.6-5 µm). Other deviations were related to using centrifugation instead of filtration, adjusting of the injection volume, enlarging the sonication time to 10 min, and adjusting the flow rate.
The statistical evaluation of the data was done following DIN ISO 5725 and "Guidelines for CIPAC Collaborative Study Procedure for Assessment of Performance of Analytical Methods". For TC1 lab 1 and 2 were Cochrans' outliers. For SC1 lab 3 and 11 were Cochrans' outliers. For SC2 lab 1 and 11 were Cochrans' outliers, and finally for SC3 lab 1 was a Cochrans' outlier. Including all results the Horrat values were 0.45, 0.36, 0.63, 0.78, and 1.08 for TC1, TC2, SC1, SC2, and SC3 respectively. After elimination of the outliers Horrat values of 0.36, 0.36, 0.49, 0.60, and 0.62 were obtained for TC1, TC2, SC1, SC2, and SC3 respectively.

The organizers proposed that the method would be accepted as a provisional CIPAC method.

The following comments were received from the meeting:

- Mr Bascou remarked that etpyrafen is transitional name as the proposed name was not accepted by ISO. This was acknowledged by Ms Wang and both she and Mr Hänel remarked that the acceptance of a new name is expected soon. However this will not block the acceptance of the method as provisional CIPAC method.
- Mr Hänel made a remark that many different HPLC columns were used which was not the aim of the method. During the 2010 meeting in Geneva he will address this item further.

4.6 Florasulam by Mr Eric Zhao (5205, 5206)

Mr Eric Zhao presented the results of a small scale CIPAC collaborative trial for the determination of florasulam in one TC; and in one SC formulation. The samples were extracted with acetonitrile followed by sonification. Quantification of the florasulam content was determined by reversed phase C18 HPLC, using a

water+phosphoric acid/acetonitrile gradient, UV-detection (260 nm) and external standard calibration. The retention time of florasulam was approx. 6.4 min. The recoveries obtained from spiked samples to blank formulation ranged from 99.1-99.8% with typical RSDs below 0.6% (n=3 to 6).

Four laboratories participated in the trial out of which three used an identical reversed phase C18 HPLC column and one laboratory used a reversed phase C18 column from a different supplier, however all dimensions were identical.
The calculated Horrat values were 0.17 and 0.19 for the TC and SC respectively. As explanation of the low Horrat value was proposed that only a small number of laboratories participated in the small scale collaborative trial.

The organizers proposed to proceed with a large scale CIPAC collaborative trial.

The following comments were received from the meeting:

- Mrs Nováková asked whether the addition of a small amount of water, prior to the addition of acetonitrile was tried to enhance solubilisation of florasulam. Mr Zhao replied that this was not tried as there were no problems in the analysis of the samples.
- Mrs Vinke asked whether the specificity was tested against a blank formulation or against a solvent blank. Mr Zhao replied that the specificity was tested against a blank formulation, and this will be adjusted in the report.

4.7 Hexaconazole by Mr Rajendra Petkar (5209, 5210)

Mr Rajendra Petkar presented the results of a large scale CIPAC collaborative trial for the determination of hexaconazole in two TCs; and in two WG and two SC formulations. No information was presented about the sample pre-treatment. The hexaconazole content was determined by reversed phase C18 HPLC using UV detection at 230 nm and external standardisation. Samples were sent to 29 laboratories and 26 laboratories responded in time. Statistical evaluation of the data was performed following "Guidelines for CIPAC Collaborative Study Procedures for Assessment of Performance of Analytical Methods", and included Cochrans' and Grubbs tests for outliers and stragglers. Cochran outliers were detected in TC-A (lab 17 and 22), and in SC-B (lab 3 and 17). Grubbs outliers were detected in TC-A (lab 17) and TC-B (lab 17). Lab 25 sent results of day 1 only. With outliers included all RSD_R results complied with the respective Horwitz' values, however no Horrat values were calculated. With all outliers removed the results were even better.

The organizers proposed that the method would be accepted as a provisional CIPAC method.

The following comments were received from the meeting:

- No questions or remarks

4.10 Quizalofop-P-ethyl by Mr Jinlong Huang (5197, 5198)

Mr Jinlong Huang presented the results of a small scale CIPAC collaborative trial for the determination of quizalofop-P-ethyl in two TCs; and three EC formulations.
Two methods were tested: a GC based method for quizalofop-ethyl determination and a HPLC method for quizalofop-P-ethyl determination. The identity of quizalofop-P-ethyl was confirmed by GC and HPLC retention time and infrared spectral identification.
The GC method was performed on a 15 m wide bore GC column (coated with dimethyl polysiloxane (or equivalent)), FID detection and di-n-octyl phthalate as internal standard. The retention time of quizalofop-ethyl was approx. 3.5 min. and the retention time of di-n-octyl phthalate was approx. 2.5 min. Samples for the GC method were diluted in internal standard solution (no composition mentioned) and injected without further sample preparation.

The HPLC method was performed on a normal phase, chiral HPLC column using UV detection at 237 nm. The mobile phase consisted of n-hexane/isopropanol (90/10 (v/v)) and the column temperature was 25°C. The retention time of quizalofop-P-ethyl was approx. 17.1 min. and the retention time of S-isomer was approx.18.7 min. Samples for the HPLC method were diluted in mobile phase and injected after filtration through a 0.45 µm filter if necessary.
Four laboratories (all China, three from the same company) participated in the trial. For GC analysis all participants used the same stationary phase ((5%-phenyl)-methyl polysiloxane). However dimensions of the column varied in length (15-30 m), internal diameter (0.32-0.53 mm) and film thickness (0.25-1.5 µm). For HPLC analysis three out of four participants used the same CHIRALPAK AD-H column; however one participant used the CHIRALPAK OJ-H column.
Statistical evaluation of the data was performed following "Guidelines for CIPAC Collaborative Study Procedures for Assessment of Performance of Analytical Methods", and included Cochrans' and Grubbs tests for outliers and stragglers. No outliers or stragglers were found, however only the results of the HPLC method for quizalofop-P-ethyl determination were reported. Horrat values were 0.16, 0.16, 0.42, 0.55, and 0.69 for TC-1, TC-2, EC-1, EC-2, and EC-3 respectively.

The organizers proposed to proceed with a large scale CIPAC collaborative trial.

The following comments were received from the meeting:

- Mr Pigeon remarked that the use of a wide bore GC column was not common anymore and might lead to a small number of participants. Mr Jinlong Huang replied that the best results were obtained with a wide bore GC column.
- Mr Patrian remarked that also two capillary columns were used with good results so the method could be changed into prescribing a capillary column. Mr Jinlong Huang replied that no other columns can be used.
- Mr Patrian remarked that hexane should be replaced by heptane for toxicological reasons.
- Ms Santilio remarked that the GC temperature settings in two laboratories are identical for injector, GC-column, and detector and that this was rather unusual. Mr Jinlong Huang confirmed the remark but could not explain why the settings were as mentioned.
- Mr Kratzer related to the application of two methods where the HPLC method would suffice. Mr Jinlong Huang replied that this was done to gain more information.

4.11 Spinetoram by Mr Kevin King (5189, 5190)

Mr Kevin King presented the results of a small scale CIPAC collaborative trial for the determination of spinetoram in two TCs; and two SC formulations. Both the TC and the SC are dispersed in water followed by extraction with methanol and filtration through a 0.45 µm filter (if necessary). Quantification was performed with reversed phase C8 HPLC using UV detection (250 nm) and external standardization resulting in an approx. retention time for spinetoram-J of 10-12 min. and 12-15 min. for spinetoram-L.
Eight laboratories (from Europe and the USA) participated and seven laboratories sent results back in time. However as one laboratory analyse the samples twice with different samples and different HPLC columns still eight results were obtained. Five out of eight sets of results were obtained with an identical HPLC column; two sets results were obtained with a comparable C8 HPLC column and one set of results was obtained with a C18 HPLC column. Both spinetoram forms were quantified separately.
Statistical evaluation of the data was performed following "Guidelines for CIPAC Collaborative Study Procedures for Assessment of Performance of Analytical Methods", and included Grubbs test for outliers and stragglers. Stragglers were identified for TC-1 (lab 3) and SC-1 (lab 3); outliers were identified for TC-2 (lab 3) and SC-2 (lab 3). As laboratory three was the only laboratory that consequently reported low results and used a reversed phase C18 HPLC column, the recommendation was made to only use a C8 column in the analysis of spinetoram TC and SC

formulations. Including the outliers and stragglers the Horrat values were 1.0, 1.1, 0.6, and 1.3 for TC-1, TC-2, SC-1, and SC-2 respectively. After omitting of the outliers and stragglers the Horrat values were 1.0, 0.4, 0.6, and 0.3 for TC-1, TC-2, SC-1, and SC-2 respectively.
All deviations of the proposed method (except the use of a C18 HPLC column) were deemed to have no influence on the result of the analysis.

The organizers proposed to proceed with a large scale CIPAC collaborative trial.

The following comments were received from the meeting:

- Mrs Nováková asked why both forms were independently quantified. Mr King answered that both forms have different specific coefficients and therefore have to be quantified separately.
- Mr Pigeon suggested to extend the scope to WG and DT formulations

4.12 Spirodiclofen by Mr Jason Zhang (5195, 5196)

Mr Jason Zhang presented the results of a large scale CIPAC collaborative trial for the determination of spirodiclofen in two TCs; and three SC formulations. Samples were sonicated with methanol and the spirodiclofen content was determined by reversed phase C18 HPLC using UV detection (260nm) and external standardization.
18 Laboratories (Europe, USA, and Asia) participated in the trial. Nearly all laboratories used a reversed phase C18 column with dimensions 250x4.6 mm, and 5µm particle size (as described in the method). However lab 4 used a UPLC column with dimensions 100x2.1 mm, and 1.7 µm particle size, and lab 16 used a deviating mobile phase.
Statistical evaluation of the data was performed and included Grubbs test for outliers and stragglers. Stragglers were not identified but three outliers were encountered for TC-A (lab 4), SC-C (lab 16), and SC-D (lab 16). Including all outliers the Horrat values were 0.47, 0.50, 0.84, 0.82, and 0.90 for TC-A, TC-B, SC-C, SC-D, and SC-E respectively. Without the outliers the results were even better.

The organizers proposed that the method would be accepted as a provisional CIPAC method.

The following comments were received from the meeting:

- Mr Perez Albela Vera remarked that the use of UPLC in case of lab. 4 explains the difference in results.

5. Reports of expert witnesses on other matters

5.1 Applicability of 33/LN/(M)/3 to LN coated with deltamethrin SC and PBO CS by Mr Mo Lingzhi (5204)

Mr Mo Lingzhi presented the results of a study to prove that CIPAC method 33/LN/(M) was suitable for determining piperonyl butoxide (PBO) impregnated insecticidal nets in the presence of deltamethrin. Samples were extracted by refluxing for 30 min. with xylene. The PBO content was determined by capillary GC-FID on a polysiloxane, cross-linked, surface bonded stationary phase and octadecane as internal standard. Linearity was proven as the correlation coefficient was 0.999 or better. Two samples were analysed in duplicate on two days by two laboratories. The calculated RSD_R of 2.82% fulfilled the Horwitz criterion of 3.38% demonstrating that the method was fit for purpose. The method was accurate, and reproducible, and therefore CIPAC method 33/LN/(M) can be extended with the determination of PBO in coated insecticidal nets.

The following comments were received from the meeting:

- Mrs Carranza de Aguila remarked that the PBO concentration was high (3%). Mr Lingzhi replied that this was part of the formulation.

- Mr Petkar asked why no recovery or specificity was tested. Mr Bura answered that the method was not changed so there was no need for testing of the mentioned criteria.
- Mr Bascou remarked that for PBO a relevant impurity exists and asked whether the method was able to analyse this compound. Mrs Tissier answered by saying that it was not necessary at the moment because the related WHO specification was not yet made public and this is outside of the scope of this discussion. To this Mr Perez Albela Vera added that due to the dilution factor in the LN preparation there was no need for the determination of the relevant impurity.

5.2 Determination of 2,6-difluoroaniline in agricultural formulations containing florasulam by Mr Todd Kajdan (5211, 5212)

Mr Kajdan presented the results of a development study for the determination of 2,6-difluoroaniline (DFA) in florasulam formulations which in 2015 became a relevant impurity in the EU. Analysis by HPLC-UV or LC-MS proved to be insufficient sensitive or suffered from severe interference from formulation components. GC-MS analysis with SIM detection (m/z 129, 109, 101, and 82) was successful although difficulties were encountered with peak tailing, DFA degradation and memory effects. All these effects could be overcome by extracting the sample with water/1N NaOH/ethyl acetate and reducing the GC-inlet temperature to 150°C. The resulting method was tested with one EC, five SCs, five SEs, one OD, and 10 WGs. The overall average recovery of DFA was 104% with an RSD_r of 3.0% across a florasulam concentration range of 0.10-25.0% and in the presence of 10 other active ingredients.

The organizers of the study proposed to continue with a small scale collaborative trial.

The following comments were received from the meeting:

- Mr Kratzer asked whether hydrolysis was observed while treating the samples with water and 1 N NaOH. Mr Kajdan answered that this was investigated but not observed.
- Mr Wiese asked whether the extraction efficiency was investigated. Mr Kajdan answered that this was not investigated as the recovery experiments returned good results.

5.3 Density by means of digital density meter by Mr Héctor di Loreto (5201)

Mr Di Loreto presented the results of a study in which CIPAC methods for density determination were compared to a digital oscillation based method. After an introduction in which the current CIPAC methods (MT 3.1, 3.2, 3.3.1, and 3.3.2) were described the principle behind the oscillation based method was highlighted. Due to the fact that the tube's ends are fixed, there are only certain frequencies at which a stationary vibration can occur. This frequency can be related to the density of the fluid filling the tube (ρ), the volume of fluid (V) and the stiffness of the tube's material (C) by the next equation: $f = \frac{1}{2\pi}\sqrt{\frac{C}{\rho V + m}}$. Comparison of the oscillation based digital density meter with the CIPAC methods showed that the oscillation based method was easier to handle, lower in required sample amount, and more accurate and reproducible. An in-house validation with SL, EC, and SC formulations showed that the intermediate precision ranged from 0.013-0.035% (n=20-30). Also was shown that the use of digital density meters in the AgroCare Latam Proficiency Tests stepped up from 11% in 2013 to 44% in 2018.

The organizers of the study proposed to continue with a small scale collaborative trial in order to get the inclusion of this method in a future CIPAC Manual.

The following comments were received from the meeting:

- Mrs Vinke asked whether it was the intention of the organizers to update the current CIPAC method fast. Mr Di Loreto answered that this was not foreseen in 2019/2020.

5.4 MT 46.4 Accelerated Storage Test by Mr Burkhard Wiese (5217)

Mr Wiese presented a DAPF proposal for the update of MT 46.4 Accelerated Storage Test. The conditions for storage were not changed however there was no requirement to store for two weeks at 54°C to support tropical conditions. Storage at e.g. 40°C may be fully sufficient. Furthermore was proposed to delete the section about storage of solid formulations stored under pressure as this was already covered by CIPAC MT 172.2. And where the scope of MT 46.3 was limited to liquid and solid formulations, and LN and MR formulation types, the scope of MT 46.4 will be open to all formulation types. Another proposed change was that the storage containers are no longer described in detail. However for some formulation types like Mosquito Coils or LN formulations relevant information should e.g. be added to the Specification Templates in the FAO/WHO Manual.

The organizers therefore proposed to accept MT 46.4 as provisional CIPAC MT as the changes compared to MT 46.3 are not significant with the remark that MT 46.4 supersedes MT 46.3 (incl. 46.3.4 for LN / 46.3.5 for MR).

During the work related to updating of MT methods DAPF encountered that differences exist in the way MT methods are updated. Updates can be added to or can supersede the previous versions of the MT method. In the first case the previous versions remain active and in the latter case the previous versions are made inactive. As it was not always clear which route was followed and DAPF suggests stating this clearly with each update.

The following comments were received from the meeting:

- Mrs Julinkova remarked that note 6 is no longer part of the new proposal. In the answer it was mentioned that all formulations should not have a boiling point at the storage temperature. I there would be a pressure, opening would cause problems for the operators.

6. Revision/update of CIPAC guidelines

6.1 DAPF proposal concerning the conduction of collaborative trials for MT methods by Mrs Claudia Vinke (5203)

Mrs Claudia Vinke presented a DAPF proposal concerning the conduction of collaborative trials for MT methods. The proposal focussed on the validation procedures for trigger sprayers and aerosol dispensers. At the 2018 meeting in Panama a small scale trial was presented and a large scale trial could be conducted. However conducting the collaborative trial poses problems as the global transport costs are extremely high due to the presence of flammable liquids in the formulations. Two options to solve this dilemma were presented.

- Are the laboratories willing to take over the transport costs (possibly up to 1.000 € per trial)?
- Can CIPAC agree with limiting the large scale trial to the region Europe in this exceptional case?

The following comments were received from the meeting:

- Mr Hänel asked whether this was just an activity from DAPF to have a method or is needed because there will be FAO/WHO specifications.
- Mr Olivier remarked that regulating authorities need methods, there are no WHO specifications. Furthermore, he remarked that already a lot of effort was put into the method and it would be a pity if the large-scale collaborative trial could not be performed.

- Mrs Tessier remarked that this should not be a CIPAC item, this is out of the scope of this meeting.
- Mr Hänel remarked that the picture was clear and that the discussion would be finalised in the closed meeting on Thursday as the decision would have implications on other studies, too.

6.2 Distribution/shipping and labelling of the collaborative trial samples by Mr Ralf Hänel (5202)

Mr Ralf Hänel brought to the attention of the meeting that shipment of collaborative trial material should be properly labelled. Several examples were brought to his attention regarding incorrect labelling, aiming at avoiding customs difficulties. It is known that customs regulations can be difficult and troublesome however they cannot and should not be disregarded. Several remarks from the meeting underlined this approach. Some laboratories will refuse to accept mislabelled samples as they are obliged to do so according to their ISO 17025 accreditation.

6.3 A Comparison: Multianalyte Method Validation versus Product Method GLP Validation for Technical Active Ingredients by Mrs Mary Ellen McNally (5218)

Cancelled as presentation was made on the CIPAC symposium.

6.4 Update on the development of a Multi-Active Method for the analysis of Formulated product active substances by Mr Jim Garvey (5219)

Cancelled as presentation was made on the CIPAC symposium.

6.5 CIPAC guidelines for the development and adoption of Multi Active Ingredient and Matrix Methods (MAIMM) for pesticidesby Mr Olivier Pigeon (5222)

Cancelled. Postponed to next year meeting.

7. Replacement of obsolete methods, comments to existing methods, errata

7.1 CIPAC review of Handbooks G, H, J and K

Mr Hänel expressed his gratitude to ESPAC and DAPA in reviewing Handbooks. No comments were received. Mr Patrian asked whether possible links to other specifications were checked. As no comments were received this was thought to be done.

7.2 Comments to existing methods

Icaridin CIPAC handbook K, page 65

Mr Perez Albela Vera remarked that the mentioned flow rate should be 1.5 ml/min instead of 15 ml/min.

8. Minutes of the 62nd meeting (5186/P)

The minutes were circulated to the participants by e-mail and were available on the website. No comments were received, as a conclusion the minutes are accepted as a true record of the last year meeting.

- No remarks, comments, questions were received.

9. Secretary's report (5187/P)

Mr Bura presented the Secretary's report. The report was previously circulated to members by e-mail. No comments were received. It was accepted.

- No remarks, comments, questions were received.

10. Discussion of individual compounds

749 Dinetofuran
At the previous meeting, the method was accepted as provisional. No further comments were received. The method can be promoted to a **full CIPAC method**.

582 Imidacloprid
At the previous meeting, the method was accepted as provisional. No further comments were received. The method can be promoted to a **full CIPAC method**.

408 Propiconazole
At the previous meeting, the method was accepted as provisional. No further comments were received. The method can be promoted to a **full CIPAC method** with a note about the inclusion of acetone.

745 Prothioconazole
At the previous meeting, the method was accepted as provisional. No further comments were received. The method can be promoted to a **full CIPAC method**.

743 Prallethrin
At the previous meeting, the method was accepted as provisional. No further comments were received. The method can be promoted to a **full CIPAC method**.

MT 30.6
At the previous meeting, the method was accepted as provisional.
Mr Patrian remarked that a request from industry was received to insert a text about automatic measurements. Mrs Tessier clarified that the request had nothing to do with the method but only with the software of the automated system. This was confirmed by Mr Patrian. Mr Hänel proposed therefore not to include the requested text as the text could easily be incorporated in the GLP procedure of the individual laboratory.
The method can be promoted to a **full CIPAC method** without the requested text change.

MT 172.2
At the previous meeting, the method was accepted as provisional. No further comments were received. The method can be promoted to a **full CIPAC method**.

MT 184.1
At the previous meeting, the method was accepted as provisional.
Mrs Nováková asked to change the volume settings to 25 ml ± 1 ml as no glassware could be found which was graduated at 25 ml (only graduation at 24 and 26 ml exist). Advice from the meeting was offered how to deal with this problem. Mr Dubois expressed his disagreement as a change of 2 ml is more or less 10% of the remaining volume and there would be a large difference in the a.s. content.
The method can be promoted to a **full CIPAC method** without the volume settings change.

Active substances discussed this year:

4.1 Acephate

A large-scale trial was presented, the method can be promoted to **a provisional CIPAC method** including a note that the method also works without the use of an internal standard. The method should be provided in CIPAC format.

4.2 alpha-Cypermethrin + chlorfenapyr

A large scale trial was presented and the method can be promoted to **a provisional CIPAC method** for LN formulations.

4.3 Atrazine

A large scale trial was presented and the method can be promoted to **a provisional CIPAC method**. However, it was requested that the result of the applied multimethod should be removed from the data set which was agreed upon by the meeting. In addition, the HorRat-value for the trial should be calculated and in case that the results need a justification, this should be provided to the CIPAC secretary.

4.4 Broflanilide

A large scale trial was presented and the method can be promoted to **a provisional CIPAC method**.

4.5 "Etpyrafen"

A large-scale trial was presented, the method can be promoted to **a provisional CIPAC method** including a remark about the transitional name. CIPAC should be informed as soon as possible about the decision of ISO concerning the ISO common name. Mr Hänel mentioned that the aim of CIPAC collaborative trials is to test methods and not proficiency of the laboratories. In this case only 4 laboratories used the respective column.

4.6 Florasulam

A small scale trial was presented and the method was proposed for a large scale collaborative trial.

4.7 Hexaconazole

A large scale trial was presented and the method can be promoted to **a provisional CIPAC method**. In addition, the HorRat-value for the trial should be calculated and in case that the results need a justification, this should be provided to the CIPAC secretary.

4.8 Mancozeb

A large scale trial was presented and the method can be promoted to a **provisional CIPAC method**. Some discussion arose whether the large number of Chinese participants (75%) could be regarded as a regional collaborative trial. In the end this was judged not to be the case. In addition, the HorRat-value for the trial should be calculated and in case that the results need a justification, this should be provided to the CIPAC secretary.

4.9 Metribuzin

A small scale trial was presented and the method was proposed for a **large scale collaborative trial**.
Mr Hänel and Mr Bura will contact both companies to find a solution for the two developed, but very similar methods, whether it would be possible that the companies agree on a procedure to run a joint collaborative trial.
Mr Bascou remarked that it was a question of miscommunication as there was no CIPAC communication protocol available for exchange of information about small scale trials. Mr Hänel remarked that this was a point of discussion for the closed meeting on Thursday. Nevertheless Mr Bascou stressed that such a procedure might be important in case of renewals of FAO/WHO specifications.

4.10 Quizalofop-P-methyl

A small scale trial was presented and the method was proposed for a **large scale collaborative trial**.
Mrs Tessier remarked that not all questions were properly answered. Mr Hänel replied that a large-scale trial could be performed, however the questions need to be answered and Mr Bura and he would contact the organizers for clarification. Clarification is also needed on why a wide bore GC column is mandatory, as to labs used a capillary column and the results were acceptable; is it possible to replace hexane by heptane for safety reasons? Before running the full scale trial, it should be clarified if the chiral method also quantifies the substance, because in this case there is no need for the GC method.

4.11 Spinetoram

A small-scale trial was presented and the method was proposed for a **large scale collaborative trial** with the recommendation to include WG and DT formulations, but this is up to the company to decide.

4.12 Spirodiclofen

A large scale trial was presented and the method can be promoted to a **provisional CIPAC method**.

5.1 Applicability of 33/LN/(M)/3 to LN coated with deltamethrin SC and PBO CS.

The applicability of 33/LN/(M)/3 to LN coated with deltamethrin SC and PBO CS was confirmed.

5.2 Determination of 2,6-difluoroaniline in agricultural formulations containing florasulam

CIPAC supports the intention to start a trial for the determination of the relevant impurity via the CIPAC platform. Mr Bura will agree with the organizers on an info sheet so that a small-scale collaborative trial can be performed.

5.3 Density by means of digital density meter

Mr Hänel remarked that DAPF will start a small scale trial.

5.4 MT 46.4 Accelerated Storage Test

MT 46.4 can be promoted to **provisional**. It was proposed that the method supersedes all previous methods.

6.1 DAPF proposal concerning the conduction of collaborative trials for MT methods

At the moment CIPAC does not see the need to change its rules or to create a precedence case for a “nice-to-have-method”. Will be discussed in the closed meeting on Thursday.

6.2 Distribution/shipping and labelling of the collaborative trial samples

Not discussed

11. Matters related to FAO and WHO specifications

Mrs YongZhen Yang expressed her gratitude for the excellent collaboration between CIPAC and FAO/WHO and stressed the importance of CIPAC methods for industry, food security and health.

Mr Perez Albela Vera agreed completely. Furthermore he expressed his wish that CIPAC methods should be available faster in order to keep up with developments and he suggested that meetings perhaps could take place twice a year.
Mr Hänel clarified that he did not made a complaint about the number of collaborative trials but that his complaint related to the time schedule of the delivery of data and presentations. Many presentation requests arrived this year after the final date which was set by Mr Bura and Mr Hänel.

12. Any other business
No remarks, comments, questions were received.

13. Closure

Mr Hänel thanked the organising team and the participants for their contribution to the success of the meeting and closed the meeting.

Ralf Hänel chairman	László Bura secretary	Theo de Rijk assist. secretary