

Creation of universal reference materials for harmonization of cotton stickiness characterization (HarCoStiC)

Overall objective: the setting-up of Reference Materials is foreseen in order to 1) harmonizing the results of stickiness testers, and 2) and to assuring the reliability and the comparability of stickiness testers results. Ultimately, cotton trading will be possible with confidence at any time, at any level of the supply chain.

Entomological stickiness in cotton fibers causes various kind of productivity and quality problems/losses at the processing steps (spinning and beyond) in the textile industry. As a consequence, countries suspected to produce sticky cotton suffer from pricing discounts (which could rise up to 20% of the market cotton selling price per kilogram) or even a full reject of their production.

Some characterization techniques, more or less reliable and predictive of the processing performances, have been issued so that cotton merchants and users could manage their stocks to decrease, avoid, or mitigate any risk of stickiness. It appeared that these measuring techniques suffer from a lack in harmonization of their result levels and of their repeatability. To start the harmonization process, a key element is missing: a set of reference materials to calibrate and/or check the instruments in each laboratory.

The biggest problem is that stickiness in fiber production is neither constant nor cyclical (Figure 1). Indeed, cotton producing areas may produce sticky fibers some years and non-sticky cotton fibers during other years. Therefore, no Fund is devoted to favor research on the long run on stickiness issue in order to finally propose long-lasting solutions. In the absence of the required support, the necessary research efforts cannot be achieved and therefore the steps towards measurement harmonization have not been achieved up to now.

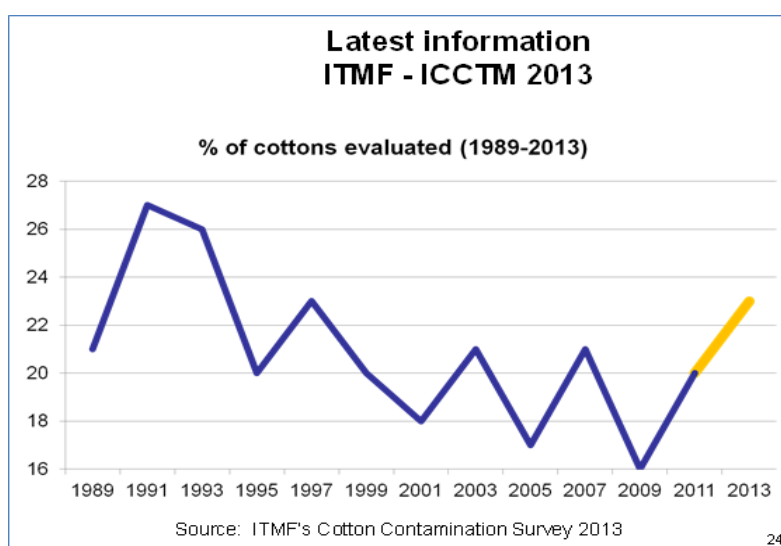


Figure 1: Evolution of Textile Manufacturing Companies answers reporting about cotton origins suffering from stickiness in the ITMF Cotton Contamination Survey. Despite the low precision of this periodical survey, it is always conducted in the same way, and therefore, it can highlight trends on the long term. The last point on the right is located at the same level as in the 90's, where the CFC/ICAC/11 Project was conducted for four years (see www.icac.org, CFC projects).

It is also known that entomological stickiness is linked to both cotton cultivation conditions (variety, cropping system) and insect infestations in the cotton fields. These infestations also induce production losses at the field. Compared to stickiness appearances, these production losses appear to be more constant during the time and were the reason for many researches and for the development of several pest management practices against whiteflies, aphids and mealybugs. Already questions are raised and studies are made on the impact of the climate change onto these insect populations on the production expectations.

However, the answers given up to now in these researches are not enough to answer the specific question raised by **the objective of identifying the required steps to create a) one/several set(s) of reference materials (RefMat) for stickiness measurement b) from various entomological origins c) to harmonize techniques.**

To achieve this overall objective, the following specific objectives will have to be addressed by entomologists together with technologists and textile processing specialists:

- Set-up a procedure to producing cotton fibers with known source of contamination (whitefly, Aphid or mealybug at least) with known stickiness levels,
- Set-up a network of laboratories able to establish results for RefMat according to the given specific procedure created in this project,
- Set-up of an approved system for internationally establishing stickiness reference results on RefMat,
- Establishment of sets of RefMat to be used in laboratories,
- Evaluation of the benefit of RefMat into the harmonization of stickiness results,
- And finally the set-up of an arbitrage system in case of dispute.

Many questions will have to be answered on our way, such as:

- Which insect type produces which individual sugar at every location and in which proportion?
- Which problem is induced by which insect population/which individual sugar?
- Which procedure will be used to produce stickiness reference material sets and to establish their stickiness level as a function of the original insect population, taking care of the above?
- How to repeat this production as many times as required to avoid reference materials exhaustion?
- What measuring techniques effectively measure stickiness (and nothing else) in a predictive manner and in an harmonized way across measuring techniques?
- Is it possible to set-up an arbitrage system for stickiness characterization¹?

The overall organization of the project is based on an iterative building-up approach (Figure 2), where every new learning about every single condition to produce reliable RefMat is capitalized in a shared database to be used on the long-run, and where the procedure to producing and establishing RefMat, from greenhouse or cotton field to RefMat delivery, is a key component. A consortium of Research Teams could be constituted for 3-4 years to answer these questions and issues.

The foreseen global aim is 1) to have better basis for comparing test results from different laboratories worldwide, 2) to detect stickiness accurately and precisely with less risk of claiming about "too variable results" to conclude about the infestation, at the trade level at least, 3) to allow a reliable characterization, even at earlier stages in the production, thus avoiding financial discount and long lasting bad reputation for producing origins, and 4) to maintain/improve fiber quality and spin-ability while maintaining/improving its value.

¹ To take discussions into account during ITMF-ICCTM meeting in Bremen, March 2016.

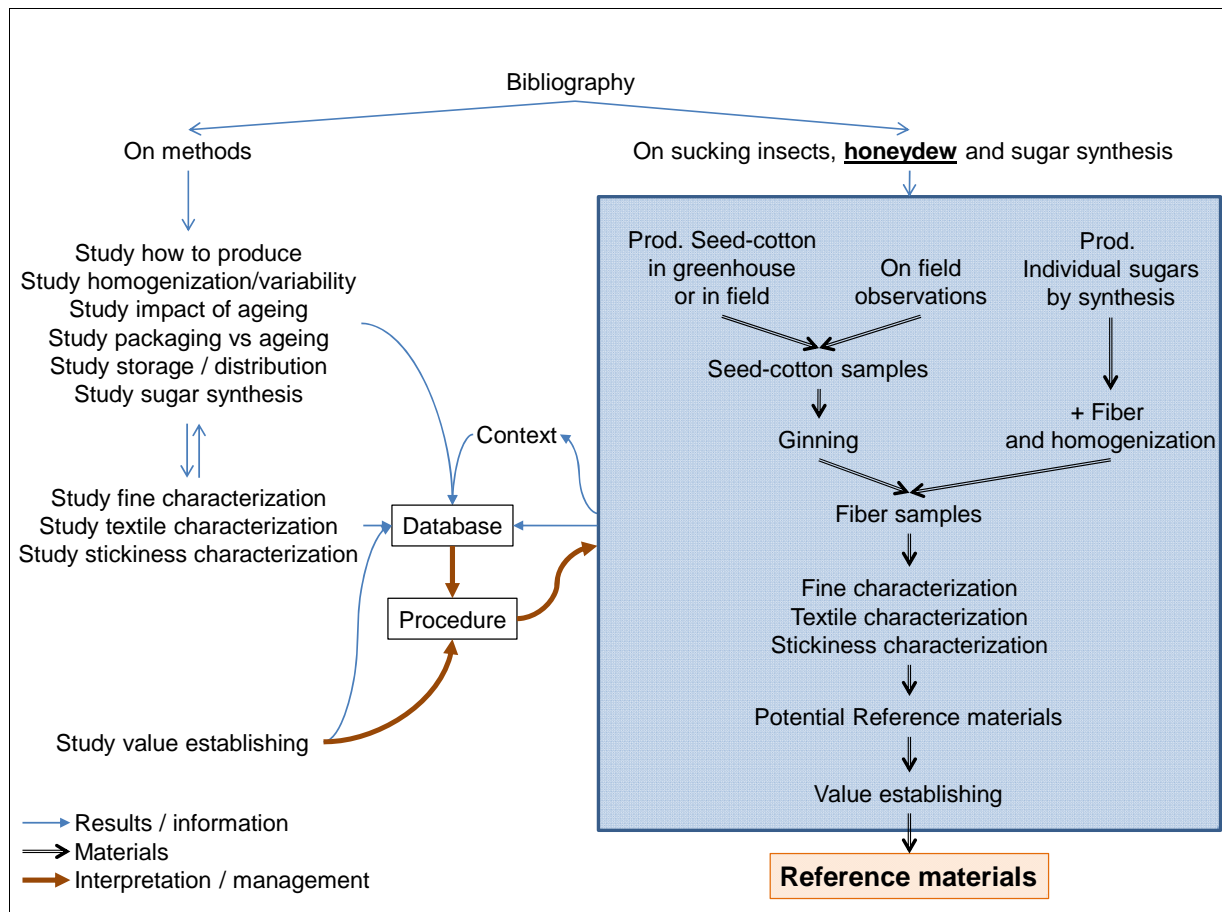


Figure 2: Overall organization of the proposed Project looking after the way 1) for producing sticky seed-cotton with a known source and level of honeydew, 2) for learning about the best practices for packaging and characterizing fibers for stickiness, and 3) for establishing reference results for most characterization techniques with international approval of the Reference Materials, in order to produce Reference Materials for all cotton supply chain users.

To document this proposal, several documents are attached hereafter:

- A logical framework listing the objectives, the target groups, the reasons to include activities, their outputs and the assumptions made for realizing them;
- A rough schedule of the required activities (even though I planned this in more details, this is available on demand);
- And a rough budget estimate for this Project expected to last 3-4 years to get a reliable long-lasting harmonization system.

We stay at disposal for any discussion.

Jean-Paul GOURLOT, June 10, 2016

Project Description		Indicators	Source of Verification	Assumptions
Overall Objective	<i>Quels sont les objectifs généraux d'ensemble auxquels l'action va contribuer?</i> What are the overall objectives to achieve the action?	<i>Quels sont les indicateurs clés liés aux objectifs généraux ?</i> What are the indicators?	<i>Quelles sont les sources d'information pour ces indicateurs ? How will the information be collected, when and by whom?</i> Where to find the informations relative to the indicators?	
Overall Objective	Create Reference Materials (RefMat) for 1) harmonizing the results of stickiness measuring testers, and 2) and for assuring the reliability and the comparability of stickiness testers results so that the cotton trading can be made with confidence at any time, at any level of the supply chain	At least a set of RefMat exists and a round-test for stickiness testers is available for Partners and laboratories	Contact location for getting RefMat, and RefMat available for distribution among users, and laboratories participate to the round-test	Real interest by users exists for such harmonization of stickiness characterization in the world
		A website (intranet and internet) is created to capitalize acquired knowledge, and inform Project Partners and Users	Intranet and internet	Project is funded, even though it is a difficult topic bridging insect control in the cotton fields to textile performance of cotton fibers
		A data management plan system (DMPS) is developed to store and share any event occurring in the Project (data, knowledge, budget, procedure,...) with Project Partners	DMPS, intranet (also some documents on internet)	
		The past and actual versions of the procedure to produce and establish RefMat is ready for further uses	Procedure available on DMPS	
Specific objectives	<i>Quels objectifs spécifiques l'action doit-elle atteindre comme contribution aux objectifs globaux ?</i> What are the specific objectives?	<i>Quels indicateurs montrent en détail que l'objectif de l'action est atteint ?</i> What are the indicators?	<i>Quelles sont les sources d'information pour ces indicateurs ?</i> Where to find the informations relative to the indicators?	<i>Quels facteurs et conditions hors de la responsabilité du Bénéficiaire sont-elles nécessaires pour atteindre cet objectif ? (conditions externes) Quels sont les risques à prendre en considération ?</i> What assumptions must hold true to achieve the planned outputs? Which risks to be taken?
	Set-up a procedure to producing cotton fibers with known source of contamination (whitefly, Aphid or mealybug at least) with known stickiness levels	Available procedure and RefMat produced with known targeted reference results	Contact location for getting RefMat, website and DMPS	Conditions (fields, insect control, involved bodies, funding source, availability of characterization tools and means...) of growing contaminated cottons are met
	Set-up a network of laboratories able to establish results for RefMat according to a specific procedure created in this project	Available network of laboratories and procedure	DMPS and intranet	Participating laboratories are willing to work on stickiness, to invest/maintain investments in stickiness measuring testers, and to participate to the network
	Create a system for internationally establishing stickiness reference results on RefMat	Procedure developed and made available for producing RefMat, and at least one set of RefMat established	Intranet, RefMat available for use	Project Partners will use the exact developed procedure
	Establish sets of RefMat	At least one set of RefMat established, thanks to the network of laboratories	Intranet, RefMat available for use	Production and establishing conditions can be met for providing RefMat as expected
	Evaluate the benefit of RefMat into the harmonization of stickiness results	Priodic round-test for stickiness testers implemented and used by laboratories	Public information about round-test results on intranet and internet	Adoption of the system (RefMat+Testers+round-tests) by the industry sectors at all levels (producers, traders, spinners, ...)
	Create an arbitrage system in case of dispute	Existing arbitrage system	Procedure available on DMPS and internet	Adoption of the system (RefMat+Testers+round-tests) by the industry sectors at all levels (producers, traders, spinners, ...)
Target groups	Laboratories of the value chain which are using stickiness testers to control the accuracy and the precision of their stickiness evaluations, for trading and management purposes, in all the following sectors: Cotton producers / growers to control/mitigate stickiness and sell their cotton without financial discount Traders for best purchases from producers/growers and sales to spinners Controllers to assure the service to their customers Spinners to insure that their cotton will not cause quality or productivity problems			
Purpose – Direct benefits to the target group(s)	Assure the reliability and the comparability of stickiness testers / laboratories results so that the cotton trading can be made with confidence at any time, at any level of the supply chain	Variability level in round test results between techniques and between instruments of same technique is decreasing	DMPS, intranet and internet, round-test reports	Adoption of the system (RefMat+Testers+round-tests) by the industry sectors at all levels (producers, traders, spinners, ...)
Results – Tangible products or services delivered by the project	<i>Les résultats sont les réalisations qui vont permettre l'obtention de l'objectif spécifique. Quels sont les résultats attendus ?</i> What are the expected outputs?	<i>Quels indicateurs permettent de vérifier et de mesurer que l'action atteint les résultats attendus ?</i> What are the indicators?	<i>Quelles sont les sources d'information pour ces indicateurs ? How will the information be collected, when and by whom?</i> Where to find the informations relative to the indicators?	<i>Quels conditions externes doivent être réalisées pour obtenir les résultats attendus dans le temps escompté ?</i> What assumptions must hold true to achieve the planned outputs?
	Technologies for characterizing stickiness are known and relationships among their results to the spinning performance are known and published	At least one publication in Journals	Journals, DMPS, intranet and internet	All R&D proposed activities (see below) fully performed
	Procedure describing the method to produce and establish RefMat under an international control is produced and used	Procedure available and used	DMPS, intranet and internet	Participating laboratories are willing to work on stickiness, to invest/maintain investments in stickiness measuring testers, and to participate to the network
	An inter-laboratory round-test is in place to evaluate and establish the stickiness level of cotton being candidate as reference material, and to measure the level of harmonization between laboratories	Round-test results used for RefMat establishing, and for between laboratories variability level evaluation	DMPS, intranet and internet	Participating laboratories are willing to work on stickiness, to invest/maintain investments in stickiness measuring testers, and to participate to the network, Adoption of the system (RefMat+Testers+round-tests) by the industry sectors at all levels (producers, traders, spinners, ...)
	A first set (at least) of RefMat is distributed among users for setting/calibrating/checking instrument result precision and accuracy	First set of RefMat available for use	DMPS, intranet and internet, RefMat available for distribution	All R&D proposed activities (see below) fully performed
Activities – Tasks that have to be undertaken to deliver the desired results	<i>Quelles sont les activités-clés à mettre en oeuvre, et dans quel ordre, afin de produire les résultats attendus ? (Groupez les activités par résultats)</i> Elles sont ici regroupées par phase et étapes (MPP) List of activities (recalled in the Microsoft Project Plan file)	<i>Moyens :Quels moyens sont requis pour mettre en oeuvre ces activités, par exemple personnel, matériel, formation, études, fournitures, installations opérationnelles, etc. ?</i> What are the required means for performing the activities?	<i>Quelles sont les sources d'information sur le déroulement de l'action ? Coûts ? Quels sont les coûts de l'action ? leur nature ? (Détail dans le budget de l'action)</i> What are the sources of information on the ongoing activity? Costs? Nature? See MPP for further details	<i>Quelles pré-conditions sont requises avant que l'action commence ? Quelles conditions hors du contrôle direct du Bénéficiaire doivent être réalisées pour la mise en oeuvre des activités prévues ?</i> What assumptions must hold true to achieve the objectives?
	1_Project management		Periodic reports, DMPS, intranet	
	1.1_Produce and apply data management plan	IT Personnel, training/procedure to users, webmaster and website	DMPS, intranet, reports	Preliminary tests indicate that activity 2 will be positive, meaning that calibrating and setting instrument to a given level and/or correcting their results is possible (at least for SCT). Therefore, it seems not necessary to run Phase 1/3, step 1/2 in one step directly implementing a full development of the Project management system
	1.2_Organize initial workshop	Personnels from Partners, travels and accomodations, diffusion of global working frame work to Partners	Workshop, workshop report, DMPS, intranet	Consortium created, global working framework agreed and applied by all Partners

Project Description		Indicators	Source of Verification	Assumptions
Phase 1/3, step 1/2	1.3_Organize intermediate workshops	Personnels from Partners, travels and accomodations	Workshop, workshop report, DMPS, intranet	
	1.4_Prepare and distribute periodic scientific, technical, accounting and progress reports	Operational DMPS and intranet, results from activities available, accounting properly performed by all partners, training on reporting	DMPS, intranet, periodical reports	All R&D proposed activities fully performed
	1.5_Organize diffusion of information between Project Members and outside Project Members	Operational DMPS, intranet and internet, results from activities available, webmaster	DMPS, internet, periodical reports	All R&D proposed activities fully performed
	1.6_Participate to international seminars for dissemination of results	Results from R&D activities available and ready for communication/publication	DMPS, intranet, internet, mission reports, conference proceedings	All R&D proposed activities fully performed
	1.7_Organize final workshop	Personnels from Partners, travels and accomodations, results ready to be disseminated, invitation of Users	Workshop, workshop report, DMPS, intranet, internet	
	1.8_Manage data and information after the end of the Project (provision)	Plan for future data management and continuation of the RefMat provision on long term, personnel	Report, DMPS, intranet, internet, involved Partners	Long term expectation of use of RefMat as their benefit is proven and their use appropriated by Users
Phase 1/3, step 2/2	2_Test the feasibility of creating an 'arbitrage system' for stickiness using SCT	Testing laboratories and equipments, CIRAD SCT RefMat available, experiments using SCT only for checking the feasibility of calibrating stickiness tester results , personnel	Report, DMPS, intranet, internet, involved Partners	This phase 1/3 step 2/2 is determinant to continue the Project further or not
	2.1_Identify and prepare laboratories for being part of the arbitrage system for stickiness	Testing laboratories and equipments, CIRAD SCT RefMat available, experiments using other devices, personnel	Report, DMPS, intranet, internet, involved Partners	
	2.2_Run periodical round-tests between laboratories 1) participating to the RefMat establishment and 2) later for any willing laboratories when RefMat is available	RefMat in large quantities, experiments, personnel, laboratories	Periodical report, DMPS, intranet, internet, involved Partners	Adoption of the system (RefMat+Testers+round-tests) by the industry sectors at all levels (producers, traders, spinners, ...)
Phase 2/3, step 1/4	3_Work in entomology to know how and where to produce sticky cotton from known origins	Locations and conditions of 'growing' specific insects causing stickiness are available	Report, DMPS, intranet, internet, involved Partners	This phase 2/3 only starts if Phase 1/3 step 2/2 is conclusive.
	3.1_Study the insects populations and their dynamics under climate change pressure	Bibliography, personnel	Report, DMPS, intranet, internet, involved Partners	Existing bbliography for deducing the required know-how to grow each typical insect causing stickiness alone (or with other insects that do not contaminate cotton fibers) for answering Project global objective
	3.2_Study the insect's impact on the quantity and on the types of produced honeydews	Bibliography, personnel	Report, DMPS, intranet, internet, involved Partners	Existing bbliography for deducing the required know-how to grow each typical insect causing stickiness alone (or with other insects that do not contaminate cotton fibers) for answering Project global objective
Phase 2/3, step 2/4	4_Produce/collect sticky fibers from various insects populations, alone or in various repartition ratios	All means to produce known contaminated seed-cotton, fibers	Report, DMPS, intranet, internet, involved Partners	Above steps realization
	4.1_Organize the packaging, marking/labelling (in relation with database) and plan conservation of collected samples	Homogenizations tools, short-term and medium/long-term experiments, tests of various containers, personnel, controled laboratories, sticky materials	Report, DMPS, intranet, internet, involved Partners	Existing materials and homogenization tools (efficacy of working principles in case of stickiness mean and variance)
	4.2_Study the possibilities of producing/collecting sticky seed-cotton from various insects populations, alone or in various repartition ratios	Bibliography, personnel	Report, DMPS, intranet, internet, involved Partners	Existing bbliography for deducing the possibilities of producing sticky cotton in controlled conditions
	4.3_Produce seed-cotton contaminated by honeydew from known insects in greenhouse	Tightly controled installations in proper location, personnel, insects of various species	Report, DMPS, intranet, internet, involved Partners	Above steps realization
	4.4_Produce seed-cotton contaminated by honeydew from known insects in cotton fields in producing countries (according to findings in literature)	Tightly controled installations in proper location, personnel, insects of various species,	Report, DMPS, intranet, internet, involved Partners	Above steps realization
	4.5_Collect, homogenize, and gin seed-cotton into fibers per level in the range in standardized conditions	Homogenizations tools, experiments, controlled ginning laboratory, personnel, sticky materials, containers	Report, DMPS, intranet, internet, involved Partners	Existing materials and homogenization tools (efficacy of working principles in case of stickiness mean and variance)
Phase 2/3, step 3/4	5_Study the characteristics of produced honeydew and individual sugars (as such and/or in fiber samples)	Chemical and physical characterization techniques for measuring components of honeydew, their consequences and their inter-relationships, sticky materials from various insects (alone or in conjunction), personnel, controlled laboratories, experiments, PhD student	Report, DMPS, intranet, internet, involved Partners	The typical 'signature' of each insect's honeydew is absolutely essential and requested to properly detect its very individual components and their relative amounts in collected honeydews. This will help in recognizing them in any unknown cotton fibers and in attributing its exact cause / presence in fibers. Indeed, component relative amounts and signature have various and differential importance / incidence / consequence during processing and therefore during their trading (this is known for only a part of the insects causing stickiness but not all=>redo all analysis the same way for all potential problematic insects causing stickiness)
	5.1_Study available techniques for fine characterizations of insect honeydew	Commercial stickiness testers, experiment comparing results to prevuious step ones, personnel, controlled laboratories, PhD student	Report, DMPS, intranet, internet, involved Partners, publications in Journals	Laboratories participation to the experiments, running round-test for stickiness testers, sticky materials already produced
	5.2_Study the impact of a 'calibration' or a 'leveling' of stickiness results from commercial instruments using RefMat	Commercial stickiness testers, experiment comparing results to prevuious step ones, personnel, controlled laboratories, PhD student, first set of RefMat available	Report, DMPS, intranet, internet, involved Partners, publications in Journals	First set of homogeneous RefMat partially characterized, laboratories participation to the experiments, running round-test for stickiness testers
	5.3_Study homogenizing methods/techniques to insure a high uniformity of honeydew distribution and not disturbing honeydew deposits	Homogenizations tools, experiments, controlled laboratory, personnel, sticky materials, containers	Report, DMPS, intranet, internet, involved Partners, publications in Journals	Willing PhD student is available on this subject, homogenizing RefMat does not affect (too much) their properties (components, size and distribution of honeydew droplets, ...)
	5.4_Analyze and quantify individual sugars in honeydew	Chemical and physical characterization techniques for measuring components of honeydew, their consequences and their inter-relationships, sticky materials from various insects (alone or in conjunction), personnel, controlled laboratories, experiments, PhD student	Report, DMPS, intranet, internet, involved Partners	It is possible to base on typical 'signatures' to measure stickiness and predict its consequences, and therefore to create RefMat for harmonizing results between instruments of a same technique and between techniques
	5.5_Study the behavior of individual identified sugars at temperature, at moisture change and at processing	Chemical and physical characterization techniques, sticky materials from various insects (alone or in conjunction), personnel, controlled laboratories, experiments, PhD student, tightly controlled spinning laboratory	Report, DMPS, intranet, internet, involved Partners	Each individual suga has its own behaviour that can be observed in experiments
	5.6_Study the impact of ageing on honeydew characteristics and design storage methods / medium accordingly	Chemical and physical characterization techniques, sticky materials from various insects (alone or in conjunction), commercial testers, personnel, controlled laboratories/storage places, containers, experiments, PhD student	Report, DMPS, intranet, internet, involved Partners	Ageing is long enough (3-5 years) so that RefMat could be distributed for a potential use within a validity period that is economically acceptable
	5.7_Plan budget for PhD, MS, ... students			
	5.8_Study the long-term stability of the reference stickiness materials set(s), including in their conditioning mediums	Chemical and physical characterization techniques, sticky materials from various insects (alone or in conjunction), commercial testers, personnel, controlled laboratories/storage places, containers, experiments, PhD student	Report, DMPS, intranet, internet, involved Partners	Ageing is long enough (3-5 years) so that RefMat could be distributed for a potential use within a validity period that is economically acceptable

Project Description		Indicators	Source of Verification	Assumptions
Phase 2/3, step 4/4	6_Establish a first set of reference materials of sticky fibers	Production of RefMat is fully controlled	RefMat are produced, established and distributed	Approval is achieved at international level on the method of establishing RefMat
	6.1_Apply an homogenization if required and sampling	Homogenizations tools, experiments, controlled laboratory, personnel, sticky materials, containers	Report, DMPS, intranet, internet, involved Partners, publications in Journals	Homogenization does not perturbate (too much) characteristics
	6.2_Realize fine characterizations on investigated potential future reference materials used for the round-test	Chemical and physical characterization techniques, sticky materials from various insects (alone or in conjunction), commercial testers, personnel, controlled laboratories/storage places, containers, experiments, PhD student	Report, DMPS, intranet, internet, involved Partners, publications in Journals	Production of sticky material is feasible in fields
	6.3_Organize discussion within CSITC-TF participants	Travels and accomodation, results from above activities to be shown, personnel	Report, DMPS, intranet, internet, involved Partners, publications in Journals	Stickiness included in CSITC-TF agenda
	6.4_Organize discussion within ITMF-ICCTM working groups participants	Travels and accomodation, results from above activities to be shown, personnel	Report, DMPS, intranet, internet, involved Partners, publications in Journals	Stickiness included in ITMF agenda
	6.5_Organize international inter-laboratory round-tests using major fine and 'commercial' measuring techniques	Round-tests, personnel, experiments, large amounts of RefMat, database system allowing automated results statistical analysis (such as inclusion in CSTIC-RT database by Generation10)	Report, DMPS, intranet, internet, involved Partners	Production of large quantities of sticky material is feasible in fields
	6.6_Constitute a first set of reference material	Round-tests, personnel, experiments, large amounts of RefMat, production and establishing procedure available	Report, DMPS, intranet, internet, involved Partners	
Phase 3/3, step 1/1	4.6_Attempt to synthesize individual sugars in quantities big enough to calibrate and check measuring devices	Chemical and physical characterization techniques, sticky materials from various insects (alone or in conjunction), commercial testers, personnel, controlled laboratories/storage places, containers, experiments, PhD student	See DMPS and published data in Journals*	If possible within this Project (activity 4.5 considered as Phase 3, if Phase 2 is conclusive)

*: provided that no property rights protect the technologies and findings; in this case, see patent documents in addition/replacement.

Overall estimated budget

Phase	Step	N°_Activity	Total
1/3	1/2	1 -Project management (Phase 1)	797 233 €
		1.1 -Create and apply data management plan	221 838 €
		1.2 -Organize initial workshop	128 353 €
		1.3 -Organize intermediate workshops	136 116 €
		1.4 -Prepare and distribute periodic scientific, technical, accounting and progress reports	64 558 €
		1.5 -Organize diffusion of information between Project Members and outside Project Members	8 160 €
		1.6 -Participate to international seminars for diffusion of results	86 183 €
		1.7 -Organize final workshop	105 626 €
		1.8 -Manage data and information after the end of the Project (provision)	46 400 €
	2/2	2 -Test the feasibility of creating an 'arbitrage system' for stickiness using SCT (Phase 1)	231 980 €
		2.1 -Identify and prepare laboratories for being part of the arbitrage system for stickiness	130 902 €
		2.2 -Run periodical round-tests between laboratories	101 078 €
Total 1/3			1 029 213 €
2/3	1/4	3 -Work in entomology to know how and where to produce sticky cotton from known origins (Phase 2)	30 516 €
		3.1 -Study the insects populations and their dynamics under climate change pressure	25 430 €
		3.2 -Study the insect's impact on the quantity and on the types of produced honeydews	5 086 €
	2/4	4 -Produce/collect sticky fibers from various insects populations, alone or in various repartition ratios (Phase 2)	1 202 153 €
		4.1 -Organize the packaging, marking/labelling (in relation with database) and plan conservation of collected samples	70 360 €
		4.2 -Study the possibilities of producing/collecting sticky seed-cotton from various insects populations, alone or in various repartition ratios	59 036 €
		4.3 -Produce seed-cotton contaminated by honeydew from known insects in greenhouse	487 326 €
		4.4 -Produce seed-cotton contaminated by honeydew from known insects in cotton fields in producing countries (according to findings in literature)	477 991 €
		4.6 -Collect, homogenize, and gin seed-cotton into fibers per level in the range in standardized conditions	107 440 €
	3/4	5 -Study the characteristics of produced honeydew and individual sugars (as such and/or in fiber samples) (Phase 2)	2 119 658 €
		5.1 -Study available techniques for fine characterizations of insect honeydew	61 130 €
		5.2 -Study the impact of a 'calibration' or a 'leveling' of stickiness results from commercial instruments using reference materials	449 924 €
		5.3 -Study homogenizing methods/techniques to insure a high uniformity of honeydew distribution and not disturbing honeydew deposits	282 914 €
		5.4 -Analyze and quantify individual sugars in honeydew	375 278 €
		5.5 -Study the behavior of individual identified sugars at temperature, at moisture change and at processing	154 946 €
		5.6 -Study the impact of ageing on honeydew characteristics and design storage methods / medium accordingly	176 197 €
		5.7 -Plan budget for PhD, MS, ... students	463 250 €
		5.8 -Study the long-term stability of the reference stickiness materials set(s), including in their conditioning mediums	156 018 €
	4/4	6 -Establish a first reference materials set of sticky fibers (Phase 2)	488 482 €
		6.1 -Apply an homogenization if required and sampling	41 200 €
		6.2 -Realize fine characterizations on investigated potential future reference materials used for the round-test	226 102 €
		6.3 -Organize discussion within CSITC-TF participants	19 946 €
		6.4 -Organize discussion within ITMF-ICCTM working groups participants	15 858 €
		6.5 -Organize international inter-laboratory round-tests using major fine and 'commercial' measuring techniques	163 242 €
		6.6 -Constitute a first set of reference material	22 534 €
Total 2/3			3 841 208 €
3/3	1/1	4.5 -Attempt to synthesize individual sugars in quantities big enough to calibrate and check measuring devices (Phase 3)	461 201 €
Total 1/3 + 2/3 : to be conducted			4 870 421 €
Total 3/3 *			461 201 €
Total			5 331 623 €

* : not conducted

N°	Nom de la tâche
1	1 Project management (Phase 1)
2	1.1 Create and apply data management plan
81	1.2 Organize initial workshop
103	1.3 Organize intermediate workshops
122	1.4 Prepare and distribute periodic scientific, technical, accounting and progress reports
151	1.5 Organize diffusion of information between Project Members and outside Project Members
152	1.6 Participate to international seminars for diffusion of results
156	1.7 Organize final workshop
168	1.8 Manage data and information after the end of the Project (provision)
169	2 Test the feasibility of creating an 'arbitrage system' for stickiness using SCT (Phase 1)
170	2.1 Identify and prepare laboratories for being part of the arbitrage system for stickiness
180	2.2 Run periodical round-tests between laboratories
206	3 Work in entomology to know how and where to produce sticky cotton from known origins (Phase 2)
207	3.1 Study the insects populations and their dynamics under climate change pressure
214	3.2 Study the insect's impact on the quantity and on the types of produced honeydews
219	4 Produce/collect sticky fibers from various insects populations, alone or in various repartition ratios (Phase 2)
220	4.1 Organize the packaging, marking/labelling (in relation with database) and plan conservation of collected samples
221	4.2 Study the possibilities of producing/collecting sticky seed-cotton from various insects populations, alone or in various repartition ratios
229	4.3 Produce seed-cotton contaminated by honeydew from known insects in greenhouse
249	4.4 Produce seed-cotton contaminated by honeydew from known insects in cotton fields in producing countries (according to findings in literature)
267	4.5 Attempt to synthesize individual sugars in quantities big enough to calibrate and check measuring devices (Phase 3)
285	4.6 Collect, homogenize, and gin seed-cotton into fibers per level in the range in standardized conditions
286	5 Study the characteristics of produced honeydew and individual sugars (as such and/or in fiber samples) (Phase 2)
287	5.1 Study available techniques for fine characterizations of insect honeydew
293	5.2 Study the impact of a 'calibration' or a 'leveling' of stickiness results from commercial instruments using reference materials
307	5.3 Study homogenizing methods/techniques to insure a high uniformity of honewdew distribution and not disturbing honeydew deposits
321	5.4 Analyze and quantify individual sugars in honeydew
334	5.5 Study the behavior of individual identified sugars at temperature, at moisture change and at processing
346	5.6 Study the impact of ageing on honeydew characteristics and design storage methods / medium accordingly
360	5.7 Plan budget for PhD, MS, ... students
375	5.8 Study the long-term stability of the reference stickiness materials set(s), including in their conditionning mediums
388	6 Establish a first reference materials set of sticky fibers (Phase 2)
389	6.1 Apply an homogenization if required and sampling
390	6.2 Realize fine characterizations on investigated potential future reference materials used for the round-test
402	6.3 Organize discussion within CSITC-TF participants
408	6.4 Organize discussion within ITMF-ICCTM working groups participants
413	6.5 Organize international inter-laboratory round-tests using major fine and 'commercial' measuring techniques
423	6.6 Constitute a first set of reference material
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Projet : PjStdColl Date : Mer 08/06/16	Tâche	Jalon	Tâche reportée	Avancement reporté	Tâches externes	Regrouper par en-tête
Avancement	Récapitulative	Jalon reporté	Fractionnement	Récapitulatif du projet	Echéance	

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