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NATIONAL IMPLEMENTATION OF REGIONAL PESTICIDE POLICIES: MALI CASE STUDY REPORT

By

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1. INTRODUCTION

1.1. Context

This paper examines pesticide[1] markets and regulations in Mali. As a founding member of CILSS[2], Mali has committed to establish national regulatory institutions necessary to implement the common pesticide regulations in force throughout the CILSS region. This study explores progress to date in Mali's country-level implementation of these mutually agreed-upon regional pesticide policies. As part of a seven-country set of comparative case studies, this work collectively aims to explore the reasons for uneven rates of country implementation of regional agricultural input policies.

West African countries have long recognized their strong regional interdependencies in agricultural and food markets. For many centuries, long distance trading routes have linked different agro-ecological zones within the region. In more recent years, particularly since the Sahelian droughts of the early 1970s, cross-border movements of people, livestock, farm inputs and outputs have underscored the importance of regional interdependencies for ensuring food security.

Beginning in the 1990s, regional organizations such as CILSS and ECOWAS[3] have increasingly promoted regional harmonization of agricultural input policies as a means of accelerating agricultural productivity growth, increasing technology spillovers and improving national and regional food security. Given that the region's collection of multiple small countries straddle common agro-ecological zones, the introduction of common regional regulations throughout the region holds the promise of enabling input suppliers to exploit economies of scale in input production, procurement and distribution as well as prospects for technology spillovers (Alston 2000; Haggblade 2013). West African countries have, therefore, generally promoted regional collaboration, with particularly strong bonds developing among the francophone members of WAEMU[4] and CILSS.

While regional policies governing inputs such as fertilizer and seeds have been well studied (Keyser et al. 2015), regional pesticide policies and markets have not. In addition to filling this gap, the pesticide studies in this series offer a potentially instructive contrast between the longtime CILSS member countries, which began to implement common regional pesticide regulations in 1992, and non-CILSS ECOWAS member countries, which have recently

[1] Pesticides include three categories of agricultural inputs: herbicides, insecticides and fungicides.

[2] The Comité permanent Inter-états de Lutte contre la Sècherese au Sahel (CILSS) is an intergovernmental organization including nine Sahelian countries stretching from Cape Verde to Chad created in 1973 to coordinate efforts at drought prevention, mitigation and relief in the Sahel. Original CILSS members included the six francophone countries of Senegal, Mauritania, Mali, Burkina Faso, Niger and Chad as well as three nonfrancophone countries of Cape Verde, Guinea Bissau and the Gambia. Starting in 2011, CILSS expanded its membership to include the four humid-coastal countries of Benin, Cote d'Ivoire, Guinea, and Togo. Along with this expanded membership, CILSS broadened its mandate to promote regional food security and natural resource management. Increasingly, CILSS programs stress the linkages between the Sahelian states and countries of the humid coast.

[3] Founded in 1975, the Economic Community of West African States (ECOWAS) includes 15 member states: Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Ghana, Guinea, Guinea Bissau, The Gambia, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Largely overlapping with the membership of CILSS, ECOWAS nonetheless excludes Mauritania and Chad (both CILSS members) while including non-CILSS members Nigeria, Ghana, Sierra Leone and Liberia. ECOWAS aim to create a West African free-trade zone and eventually a common monetary union for a region with an estimated 2010 population of about 300 million people.

[4] The West African Economic and Monetary Union (WAEMU), known as UEMOA in French and founded in 1994, includes the eight francophone countries sharing the common currency of the CFA franc: Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal et Togo.

adopted the CILSS regulatory framework as its model for managing regional pesticide policies in the humid coastal zones.

The CILSS member countries have implemented harmonized regional pesticide policies among its member states despite very different levels of human, administrative and scientific capacity. For this reason, ECOWAS has modeled its West Africa regional pesticide policy regulations on the CILSS system. In April 2013, ECOWAS formally asked CILSS to help in expanding regional pesticide implementation to the coastal countries. This staggered implementation of regional pesticide policies provides a learning opportunity. As a point of departure, the early adopting CILSS member countries provide a window for exploring how the Sahelian countries managed to implement regional pesticide policies, even in countries with low levels of human and physical capital. Lessons there should help to pinpoint ways in which ECOWAS can improve future country implementation of regional inputs policies more broadly throughout the West Africa region.

1.2. Objectives

The Mali case study aims to achieve the following goals:

• provide a profile of the structure and dynamics of local pesticide markets

• examine the status of national implementation of regional pesticide policies

• identify gaps and problems in implementing regional pesticide policies

• identify key factors affecting policy implementation by formally testing the Kaleidoscope model of policy change developed as part of the Food Security Policy Innovation Laboratory's broad work on policy systems (Resnick et al. 2015).

In a second phase, by comparing these results with case study findings from other countries in the region, this work aims to help understand why some countries move rapidly to implement agreed-upon regional policies, while others move slowly or not at all. Ultimately, these comparisons aim to help identify key factors favoring country-level implementation of agreed-upon regional agricultural policies in West Africa.

1.3. Methods

The present study constitutes one of seven companion national studies of regional pesticide policy implementation in West Africa. The countries examined include three longtime CILSS members (Mali, Senegal and Gambia) as well as four coastal ECOWAS members expected to participate in the newly designed humid zone pesticide regulatory body (Côte d'Ivoire, Ghana, Guinea and Nigeria).

Using a standard research protocol, each country team has spent one to two weeks conducting interviews with national regulators and key private sector importers, distributors and retailers and users of pesticides. Diarra (2016) provides the full research protocol applied during these case studies, including market profiles, respondent selection and interview guide, while Annex 1 provides a list of persons interviewed in Mali. In addition to detailed discussions with regulators and private sector actors, the authors have analyzed available secondary data on pesticide prices, import quantities and farm-level adoption.

2. REGIONAL PESTICIDE POLICIES

2.1. CILSS regional policies

2.1.1. CILSS pesticide regulations, 1992

Because pests such as grasshoppers, locusts and grain-eating birds move rapidly across national borders, Sahelian countries have long recognized the importance of a common regional response to pest attacks. Indeed, colonial and post-colonial regional groupings, such as the Organisation commune de lutte antiacridienne et de lutte antiaviaire[5] (OCLALAV), founded in 1965, and the Organisation inter-état de controle des criquets migratoire en Afrique (OICMA), founded in 1952, were established to monitor and coordinate responses to pest outbreaks. While OICMA continues to function, organizational difficulties and precarious finances led to the dissolution of OCLALAV in 1986.

In the Sahel, a series of major pest invasions arriving in the wake of the Sahelian droughts of the mid-1970 motivated strong interest in regional pest control programs and pesticide regulation. CILSS, formed in 1973 formed to combat the drought, offered a new institutional vehicle for coordinating a regional response to the ensuing pest attacks. To manage Sahel-wide pest responses, donors selected CILSS over other existing institutions for a number of reasons: • disappointing performance by existing post-colonial regional technical groupings such as OCLALAV and OICMA; • heavy prior reliance on toxic insecticides in the face of new preferences for a more integrated approach to pest management; • desire to focus resources on the Sahel which they viewed as the most vulnerable area and in greatest need (OTA 1990).

As the droughts came to a close in the late 1970s, USAID funded a regional integrated pest management (IPM) project implemented through the CILSS agency, the Institut du Sahel (INSAH) from 1980 to 1987. In order to institutionalize an ongoing implementation capacity following termination of the project funding, CILSS established a new unit within INSAH, called the Unité de Coordination Technique Régionale en Protection des Végétaux (UCTR-PV), charged with preparation of regional regulations governing pesticides and crop protection measures.

The UCTR-PV, thus, became the initial operational agency managing regional pesticide regulations within the CILSS member countries. In 1991, the UCTR-PV, aided by external consultants, prepared two draft regional regulations for consideration by the CILSS member countries: one governing registration (homologation) of pesticides and the other governing phytosanitary controls.

In April of 1992, the CILSS Council of Ministers of Agriculture formally adopted both sets of regulations at their 27th ministerial meeting in Ouagadougou (Table 1). To implement these regulations, the ministerial resolution called on the CILSS Executive Secretary to design implementation modalities and source funding for regional regulatory operations.

[5] OCLALAV grouped together 10 West African francophone countries : Bénin, Burkina Faso, Cameroun, Côte d'Ivoire, Gambie, Mali, Mauritanie, Niger, Sénégal et Tchad.

Table 1. Policy chronology of the CILSS regional pesticide regulations

Policy actions	Legal texts	Comments
	1992 CILSS common regulations on pesticide regulation	
		• CILSS technical workshop elaborates draft regulations (1991)
Pesticide regulations adopted by the CILSS Council of Ministers of Agriculture (27th session, Ouagadougou, April 7, 1992).	Resolution N° 7/27/CM/92 of the CILSS Council of Ministers of Agriculture	
Comité Sahélien des Pesticides (CSP) established as the CILSS regional regulatory review body (1994)	Resolution N° 10/29/CM/94 concerning the application of regional pesticide regulations adopted by the 29th session of the CILSS Council of Ministers of Agriculture (Praia, Cape Verde, April 18 and 19, 1994)	• CSP based at Institut du Sahel (INSAH) in Bamako • staffing includes only the coordinator of UCTR-PV • First CSP meeting held to evaluate pesticides proposed for registration (homologation), March 1994.
	Failed legal "domestication" by national parliaments	
Country ratification of the regional regulations	• Niger (Ordonnance 96-008) • Gambia (draft legislation prepared, 1998)	• Despite approval of a CILSS-compliant national pesticide law, some of Niger's implementing instruments fail to comply fully with CILSS packaging and labelling requirements. • Gambia prepares draft legislation. CSP advises them to wait for new, revised regulations. • Multiple countries issue executive regulatory orders recognizing CSP but without revising laws to make legal framework CILSS-compliant (Burkina, Chad, Gambia, Guinea Bissau, Mali, Niger).

	1999 Revised CILSS pesticide regulations	
CILSS establishes Permanent Secretariat of the CSP to improve its functioning		• FAO launches Project GCP/RAF/335/NET: "Implementation of the interational code of conduct on pesticide utilization in the Sahel region"(1998 à 2003) • CILSS requests help from the FAO for joint review of the pesticide regulations (1998)
Adoption of revised CILSS pesticide regulations (December 16, 1999)	Resolution N° 8/34/CM/99 adopted by the CILSS Council of Ministers of Agriculture	
National ratification of the CILSS pesticide regulations by the parliaments of CILSS member states (1999 to 2005)	**1) Mali** : Instrument de ratification du 13 novembre 2001 : Loi n°01– 102 / P-RM du 30 Novembre 2001, portant ratification de l'Ordonnance n°01–046 / P-RM du 20 Septembre 2001 autorisant la ratification de la Réglementation commune aux Etats membres du CILSS Loi N° 02/014 du 3 juin 2002 instituant l´homologation et le contrôle des pesticides en République du Mali Décret n° 09-313/P-RM du 19 juin 2009 fixant les modalités d'application de la loi 02/014 **2) Senegal :** Loi n° 2002-28 du 9 décembre 2002 autorisant le Président de la République à ratifier la version révisée de l'Accord	• CSP, with FAO support, follows up with individual countries to promote ratification of the CILSS common regulations • To date, only Guinea Bissau has failed to ratify the CILSS common regulations • In May 2016, CSP held its 38th regular session in Bamako. • CSP posts a list of all registered pesticides on the INSAH website

	portant Réglementation commune aux Etats membres du CILSS **3) Mauritania** : Loi 2003-027 autorisant le Président de la République à ratifier la Réglementation commune…, du 20 juillet 2003 **4) Chad** : Instrument de ratification 03 Novembre 2003 **5) Gambia** : Instrument of ratification 19 November 2003 **6) Burkina Faso** : Instrument de ratification 2004-016/MAE-CR/SG/DAJC/STAI, du 20 juillet 2004 **7) Niger** : Déclaration de ratification de la Réglementation commune, du 29 juillet 2004 **8) Cape Verde**: Lettres de ratification de la Règlementation Commune 18 juillet 2005	

The CILSS secretariat implemented the first of these mandates in 1994 when it established the Comité Sahélien des Pesticides (CSP), a new regional regulatory body designed to review applications from pesticide companies for the right to sell specific pesticides throughout the 9-country region.[6] CILSS designers created the CSP as a one-stop-shop for companies

[6] However, CILSS did not implement the second set of regulations, on regional phytosanitary controls, reportedly due to financial constraints (CILSS 1997).

wishing to sell pesticides in any of the member countries. Under the enabling legislation, any pesticide reviewed and approved (homologated) by the CSP can be legally sold in all member countries.

The CILSS ministerial resolution creating the CSP charged the new body with the following key functions:

- Review and vet all pesticide products proposed for registration (homologation) and sale with the region
- Establish a list of public units authorized to conduct efficacy trials
- Establish a list of laboratories authorized to conduct expert analysis
- Define methods for verifying the composition and quality of pesticide products as well as their impact on human health, animal health and the environment
- Specify data and tests required by firms submitting pesticides for regulatory review
- Maintain a registry of all registered (homologated) and provisionally authorized pesticides[7]
- Inventory pesticide products sold within the CILSS member countries
- Maintain a list of dangerous and banned pesticides
- Liaise with all member country national pesticide committees (CNGP)

Membership in the CSP includes three categories of participants. Regular members include two experts from each member state, three toxicologists working in the Sahel and the Permanent Secretary of the CSP. Non-voting associate members include the Technical Director of OCLALAV as well as one representative from ECOWAS, CPI/OUA, AGRHYMET. In addition, the CSP invites observers from technical specialist agencies such as the FAO, WHO and the Comité Phytopharmaceutique de la zone humide de l'Afrique de l'Ouest et du Centre (CPZHAOC). Financing for the CSP comes from multiple sources, including CILSS, its member states, donors and fees charged to submissioners.

In March 1994, the newly constituted Comité Sahelian de Pesticides (CSP) met for the first time. At their first meeting, the CSP reviewed 98 requests for regulatory approval that pesticide firms had filed previously with the UCTR-PV. Among these, the CSP considered 68 submissions incomplete. After reviewing the 30 remaining files, the CSP issued one provisional authorization (APV) to sell an anti-acridien insecticide marketed under the tradename DIMILIN OF-6. Five others products received provisional approval, conditional on supplying a reference sample. By 1998, the CSP had met eight times and reviewed over 240 pesticides applications (Abiola et al. 2004).

The CSP operates under operating rules (règlement intérieur, or RI), signed by the Executive Secretary of CILSS. According to these operating rules, the members designate one of their

[7] For a current online listing of registered pesticides, see http://196.200.57.138/dbinsah/index.cfm?sect1=pesticide&id=58

members to preside over CSP sessions over a four-year period. Under these rules, Mr. Gnissa Konaté, representative of Burkina Faso, presided over the November 2016 CSP meeting.

2.1.2. Failed national "domestication"

Under the CILSS treaty, collective decisions of the Council of Ministers and regional regulatory bodies require ratification by national parliaments as well as issuance of conforming national regulations before they become applicable within the member countries.[8] Despite this legal "domestication" requirement, by 1998 only Niger had formally adopted the 1992 CILSS pesticide regulations into national law (Pardo-Leal 1999).[9]

Our interviews suggest two sets of constraints may have limited formal action by national parliaments. The first concerned the limited resources and staffing at the UCTR-PV, the unit that served as the Permanent Secretariat for the CSP between 1994 and 1998. With a single staff member, the UCTR-PV did not have the necessary resources to monitor and motivate 9 member parliaments. Working instead through consultants proved difficult, given sensitivities about formal protocols for modifying parliamentary calendars. A second set of difficulties revolved around ambiguities and inconsistencies in the initial regulations, which had been formulated by technicians rather than by trained lawyers.

In spite of parliamentary failure to enact formal national enabling legislation in eight of the nine CILSS member countries, the national technical agencies responsible for pesticide monitoring in practice participated in the CSP review process and generally accepted CSP pesticide registration decisions. As early as 1994, CILSS member countries have participated in CSP deliberations and honored CSP registration decisions. In fact, executive regulatory orders issued or under review by the relevant national authorities in Burkina, Chad, Gambia, Guinea Bissau, Mali and Niger referred specifically to the CILSS pesticide regulations or to the CSP (Pardo-Léal 1999). For example, Mali's Décret No.95-404 stated, "L'homologation des produits agropharmaceutiques se fait conformément à la Réglementation commune aux Etats membres do Comité Inter-etat de Lutte contre la Sécheresse et la Désertification (CILSS)." Burkina Faso's Décret No.98/472 similarly mandated that, "La Commission Nationale des Pesticides est chargée … du suivi et de l'évaluation des résolutions et recommandations du Comité Sahélien des Pesticides."

Despite de facto acceptance of CSP pesticide registration decisions, the umbrella legislation in all countries but Niger failed to comply with the CILSS regional regulations.[10] Because the umbrella laws under which these executive actions were issued did not fully conform to CILSS regional regulations, a legal ambiguity arose as to the enforceability of these executive orders. In order to convert tacit technical support for the CSP into a fully enforceable legal

[8]Unlike CILSS, the ECOWAS treaty stipulates that regional regulations adopted by ECOWAS agencies automatically assume legal force throughout the 15 ECOWAS member countries (Keyser et al. 2015). However, lawyers we have consulted suggest that under some member country constitutions, national sovereignty may dictate that national regulations take precedence over ECOWAS regional regulations. Under this interpretation, the ECOWAS treaty would be considered as subordinate to national laws and regulations. Under this states-rights interpretation, ECOWAS member countries, like CILSS member countries, would need to pass national legislation and regulations formally adoptioning the ECOWAS regional pesticide regulations in order for them to take full legal force within a specific country. To our knowledge, no one has litigated this question.

[9] Note that Gambia's parliament had also drafted CILSS-compliant legislation which they had under active review in 1998. The CSP, however, requested that the Gambians wait for revised regional regulations in order to avoid having to approve the CILSS regulations twice (Pardo-Leal 1999).

[10] Niger's1996 umbrella law on pesticide products (Ordonnance 96-008 of 21 March 1996) did explicitly recognize the CSP and the CILSS regional pesticide regulations. However, implementing instruments failed to comply fully with CILSS labelling and packaging regulations (Pardo-Leal 1999).

framework, the CILSS member states turned to the FAO for help in regularizing the legal framework governing pesticide regulation in the member countries.

2.1.3. Revised CILSS regulations, 1999

Concerned about slow national ratification of the 1992 regional pesticide regulations, the CILSS secretariat requested assistance from the FAO to help accelerate full legal enactment of the CILSS regional pesticide regulations (Table 1). Under a recently launched five-year project entitled "Mise en oeuvre du Code international de conduite sur la distribution et l'utilisation des pesticides dans les pays sélectionnés de la région du Sahel" (GCP/RAF/335/NET), the FAO supported CILSS as well as national-level agencies involved in implementing the CILSS regional pesticide regulations. Centered on the CSP, project efforts supported the establishment of a permanent secretariat for the CSP, based at INSAH. In addition, the project assisted national governments to reinforce their capacity to assess and monitor the distribution and use of pesticides. The UCTR-PV, which had served as secretariat for the CSP from 1994 through 1998, gave way to the new permanent secretariat to the CSP. The CSP permanent secretariat became operational with the start of the FAO project**.**

The FAO project team and local partners at CSP reviewed the 1992 regulations and proposed a revised set of regional regulations (Pardo-Leal 1999). Though they did not alter the content of the original 1992 CILSS regulations significantly, the 1999 revisions addressed several gaps and inconsistencies revealed by the four years of well-intended but largely uncoordinated national legislative and regulatory compliance efforts. In the end, the content of the 1999 regulations differed from the 1992 regulations in five primary ways:

• *Ratification requirements.* The 1992 legislation required ratification by all 9 member countries before the regional regulations would become operational anywhere (1992, Article 25). This technically held all member countries hostage to a single delinquent parliament. Given ongoing political unrest in Guinea Bissau, the prospect of new enabling legislation from 100% of member states seemed remote. The revised regulations, issued in 1999, solved this problem by stipulating that approval by five members states (a majority) would make the CILSS regulations operational throughout the CILSS region (1999 Article 35).

• *Retro-active legalization of CSP homologation decisions from 1994-1998.* Given the failure of all national parliaments to approve 1992 CILSS regulations, all 240 review decisions made by the CSP between 1994 and 1998 were technically without legal foundation. In order to remedy this anomaly, the 1999 CILSS regulations explicitly make the accumulated CSP decisions through 1998 approve retroactive under new (1999 Article 36).

• *Standardized renewal periods.* The 1992 rules included ambiguous language concerning the number of allowed registration renewals. The 1999 common regulations stipulate that the CSP can award provisional approvals (autorisation provisoire de vente, APV) for a three-year period, renewable only once. Full homologation, however, remains valid for a period of five years, renewable thereafter for the same period. • *Appeals.* The 1992 regulations made no provision for appeals of CSP regulatory decisions. At the suggestion of the CSP secretariat, the 1999 regulations outline a process by which a rejected file could file an appeal (1999 Article 29).

• *Common terminology and definitions.* Country-level efforts to integrate the 1992 CILSS regulations into national law resulted in a welter of differing terminology. Individual countries and statutory instruments referred variously to "pesticides" (Burkina, Gambia, Senegal, Chad), "phytosanitary products" (Cape Verde), agro-pharmaceuticals (Mali,

Senegal) and "phyto-pharmaceuticals" (Guinea Bissau). With FAO support for national drafting committees, the 1999 regulations and the enabling national legislation standardized in using the term "pesticide" along with the official definition as stated in the FAO International Code of Conduct (1999 Article 2).

In 1999, the CILSS Council of Ministers of Agriculture formally adopted the revised regional pesticide regulations via Resolution No. 8/34/CM/99. With follow-up support from the permanent CSP secretariat and the FAO, member country parliaments gradually introduced national legislation formally adopting the regional regulations and establishing the national regulatory structures required to implement the CILSS regional pesticide regulations. Mali's parliament became the first to adopt legislation implementing the regional regulations in November 2001. The 1999 CILSS pesticide regulations and regional regulatory body become legally functional in 2003, after Gambia became the fifth member state to formally ratify them. By 2005, Cape Verde became the eighth of the nine original CILSS member countries to pass national legislation and regulations explicitly adopting the CILSS regulations and the CSP as a common regional regulator (Table 1).[11]

CILSS membership expanded in 2011 when four coastal francophone countries of Benin, Côte d'Ivoire, Guinea and Togo formally joined. At that point, the CILSS regional pesticide regulations and regulatory structures became available to the newcomers. Nonetheless, none of the four has adopted conforming national legislation. Nor have any of the four newcomers submitted any pesticide dossiers to the CSP for review. Instead, they have each continued to regulate pesticides through their pre-existing national pesticide committees.[12] However, since 2013 they have attended the bi-annual CSP meetings as observers. Since all four CILSS newcomers are also members of the broader ECOWAS grouping, the 2008 ECOWAS regional regulations on pesticides also apply to them. As with the CILSS regulations, however, the ECOWAS pesticide regulations are not yet operational in these four countries or indeed in any ECOWAS country outside of the Sahel (for example, Ghana and Nigeria). In order to speed up implementation of the ECOWAS pesticide regulations, ECOWAS has commissioned the CILSS CSP to help launch a parallel regional review body serving the coastal ECOWAS member states. The CSP will continue, as it has since 1994, to regulate pesticides for the Sahelian members of ECOWAS.

By convention, the CSP schedules ordinary meetings twice annually. Over time, homologation decisions in any given year have trended generally upwards, with particularly rapid increase in herbicide submissions over the past decade as well as a few new insecticides, primarily for horticultural products, (Table 2). In May 2016, the CSP held its 38th ordinary meeting at INSAH headquarters in Bamako. As of that time, the CSP has authorized 205 pesticide products for sale, including 126 herbicides, 67 insecticides, and 12 fungicides (CSP 2016).

[11] Due to ongoing political turmoil, Guinea Bissau remains the only original CILSS member not to have ratified the 1999 CILSS regional pesticide regulations.

[12] Three of these four countries (Benin, Cote d'Ivoire and Guinea), together with Ghana, received support under a five-year French-financed project to help organize national pesticide regulations. The HIP project (including Benin, Côte d'Ivoire, Ghana, and Guinea), began in 1993 and ended in 1999, financed by the French ministry of cooperation. At the end of the project, in 1999, each country continued to regulate pesticides through its national phytosanitary committee. Unlike the CSP, whose member countries agreed to institute common regulatory review, the HIP strategy involved harmonization of the national regulations (same registration forms are used) but it relied on independent national regulatory review and enforcement processes.

Table 2. Trends in the number of pesticides* authorized for sale each year by the Comité Sahelien des Pesticides (CSP)

Pesticides categories	1995	2000	2005	2010	2015
Herbicides	0	9	6	25	49
Insecticides	4	9	3	16	16
Fongicides	0	1	1	3	4
Total	4	19	10	44	69

* List includes products applicable to all crops as well as selective products used on cotton, maize and rice.

Source : CSP "Listes des pesticides autorisés", various years.

2.2. Implementation requirements for member countries

The regional CSP pesticide review process forms the centerpiece around which national implementing agencies operate. The CSP regulatory review, in turn, revolves around formal review and registration (homologation) decisions. Under CSP procedures, regulatory approval occurs in two stages. First-time CSP approval for any given pesticide results in the granting of a Provisional Sales Authorization (Autorisation Provisoire de Vente, or APV) for that specific product. The APV remains in force for a three year trial period during which CSP may require collection of complementary data necessary for a final approval. In the absence of any new negative information, the CSP typically grants an automatic 3-year extension of the APV. Final regulatory approval comes in the form of a registration (homologation) number valid for a period of five years and renewable thereafter.

National agencies play key roles before, during and after CSP review. The CILSS regional pesticide regulations partition responsibilities among regional and national agencies as described in Table 3. In general, the CSP focuses on the joint regulatory review and formal authorization (homologation) of pesticides proposed for sale within the region. At the national level, regulatory bodies play key roles prior to the CSP registration, during and afterwards.

Prior to the CSP regulatory review, national regulatory bodies contribute by conducting required tests of the product's biological efficacy and human toxicity. These findings form a key part of the dossier presented by private firms requesting product registration. During the CSP deliberations, each member country supplies two members to participate in the CSP deliberations and decision-making. Then, following regional regulatory approval by the CSP, national structures intervene once again to regulate and license distributors, monitor local markets, ensure product quality and safety, monitor on-farm use and conduct impact studies on human and environmental health.

Table 3. Regulatory responsibilities of member countries in implementing CILSS regional pesticide regulations

Regulatory stages	Responsibility	
	Regional	National
Pre-homologation	• establish a list of establishments authorized to conduct trials and tests • define testing methods • specify data and tests required for regulatory review	• conduct field trials and tests of product efficacy • conduct laboratory tests of product toxicity
Registration (homologation)	• CSP review and decision	• participate in CSP deliberations, twice annually
Post-homologation	• maintain registry of all authorized pesticides • maintain list of banned pesticides • liaise with country national pesticide committees	• license distributors • monitor products sold on local markets • confiscate and dispose of counterfeit, unregistered or outdated pesticides • promote awareness of existing regulations and safety issues • provide training and information on proper pesticide use

3. PESTICIDE MARKET PROFILE

3.1. Product composition

Herbicides currently dominate Mali's pesticide markets, in terms of marketed volumes, with insecticides in second place, particularly among cotton and horticulture producers. Fungicides quantities, however, remain very small, limited primarily to horticultural production. Although total quantities (and value) of insecticides used by Malian farmers slightly exceed herbicides, most insecticides are distributed in bulk through large institutional buyers rather than through the open market (Table 4). Mali's Compagnie Malienne pour le Développement du Textile (CMDT) tightly coordinates cotton farmer input supplies, which they distribute to their farmers on credit. In the case of insecticides (as well as herbicides and seeds), CMDT bulk orders supplies, which it then imports and distributes directly to its contract farmers through farmer cooperatives. As a result, input distributors and our visual inspections of agricultural markets across Mali both confirm that herbicides account for a large majority of pesticide volumes marketed.

Among herbicides, traders indicate that glyphosate accounts for the bulk of herbicide sales. Visual inspection of local markets affirms this dominance. In fact, during our market visits in May and June 2016, our team identified 25 different brands of glyphosate being sold (see Figure 1 for a partial display). Farm-level survey data offer a rough quantification of this preference. A recent survey of sorghum and maize farmers in southern Mali indicates that glyphosate accounts for about two-thirds of the volume of herbicide applications on cereal plots, with selective herbicides accounting for the remaining one third (Table 5).

Table 4. Composition of pesticide imports into Mali, 1990 to 2014

Pesticide category	1990-4	1995-99	2000-04	2005-09	2010-14	annual increase (%)
A. Volume (tons)						
Herbicides	275	1,056	868	1,321	2,587	5.0
Insecticides	1,846	1,984	2,707	3,135	3,094	1.1
Fongicides		338	59	183	446	0.8
B. Value (millions of CFAF)						
Herbicides	478	3,330	3,132	3,231	5,080	5.3
Insecticides	2,083	4,292	6,863	4,312	6,313	2.4
Fongicides	398	180	183	366	787	1.5
Total	2,959	7,802	10,178	7,909	12,180	
C. Price ('000 CFAF/liter)						
Herbicides		3.2	3.7	2.4	2.0	-1.3
Insecticides	1.1	2.2	2.6	1.8	2.1	1.4

Source: INSTAT (2016).

Table 5. Farmer use of registered and unregistered herbicides on maize and sorghum plots in southern Mali, 2014/15

Herbicide type	Herbicide registration		
	registered	uncertain	total
Percent of plots using herbicide			
Glyphosate*	34	40	74
Selective**	20	7	27
Total	53	47	100
Percent of herbicide volume used			
Glyphosate*	31	36	67
Selective**	24	9	33
Total	55	45	100

* Non-selective, total herbicide.

** Nicosulfuron, pendimethalin, atrazine, isoxaflutole, 2,4-D.

Source: CSP INSAH (2013), Smale et al. (2015) survey data analysis.

Unregistered pesticides, particularly off-brands of glyphosate, appear in large quantities in Malian markets. Major pesticide importers, who represent the principal international brands, complain routinely about the large volume of counterfeit and unregistered imitation products available on the market. Given highly porous border crossings into Mali from Guinea, Ghana and Burkina Faso, smuggled pesticides arrive in Mali routinely. The regulators and traders we interviewed estimate that unregistered or counterfeit herbicides may account for as much as 30% to 70% of herbicide volumes sold domestically.

Farm surveys lend support to the trader complaints. Cereal farmers in southern Mali report that the broad set of "Beret Rouge" brands of glyphosate accounts for 36% of herbicide use, while several unregistered selective herbicides (including some banned substances such as atrazine and paraquat) account for a further 9% (Table 5). Glycel, the original Red Beret herbicide, is registered as are several other imitators. Nevertheless, a great proliferation of unregistered imitators have flooded into the Malian markets as entrepreneurial smugglers respond to growing farmer demand for herbicides by bringing in counterfeit products manufactured in China and India on demand for regional traders (see Figure 1). Since some of the "Beret Rouge" brands referred to by farmers are, in fact, legally registered with CSP, the 45% share reported in Table 5 places an upper bound on volume of unregistered herbicides in southern Mali.

Figure 1. Glyphosate brands available for sale in Mali, June 2016

a. Roundup and imitations

b. Beret Rouges

Source: field visits.

3.2. Farm-level demand

All Malian cotton farmers apply insecticide to combat boll worms and other pests. As a result, cotton farmers account for the overwhelming majority of insecticides applied on Malian farms. Over time, growing insect resistance has forced Mali's CMDT to supply an evolving cocktail of insecticides to their contract cotton farmers (Tefft 2010). During the 1990s, as a result of growing insect resistance and increased cotton production, the volume of insecticides applied on cotton fields doubled, exacerbating worries about toxicity in humans and environmental impacts (Keita 1992, Camara et al. 2003). Horticultural farmers also rely heavily on insecticides. They likewise account for the majority of fungicide sales in Mali.

Farmers use herbicides to control weeds on commercial crops such as cotton as well as on most cereals (sorghum, maize and rice). During the 2014/15 cropping season, for example, farmers in southern Mali applied herbicides on slightly over 60% of their maize and sorghum plots. In these zones, herbicides cost less than half as much as hiring hand weeding labor, on average: $23 per hectare for herbicides compared to $52 per hectare to hire hand weeding labor (Haggblade et al. 2016).

Herbicide adoption rates vary spatially, driven by differing herbicide prices and labor costs. In areas close to Bamako, labor costs rise and herbicide prices fall, leading about 75% of farms to apply herbicides. In contrast, farmers in remote rural areas face higher herbicide prices (because of transport costs and limited competition) and lower labor costs (because of fewer off-farm opportunities). As a result, herbicide use falls to about 25% of plots in the remote rural areas (Haggblade et al. 2016).

Changing weed populations have also contributed to gradually rising on-farm herbicide use. In the irrigated farming perimeters of Mali's Office du Niger (ON), pressure from wild rhizomatous weeds (such as *Oryza longistaminata*) have made traditional means of weed control, through flooding and hand weeding, insufficient for controlling these invasive weeds. Increasingly, early season glyphosate application offers the most effective means of systemic killing of these rizhomes (Soungalo 2016). As a result, both economic and environmental forces appear poised to promote increased herbicide use in coming years. Many of the most powerful forces shaping farmer demand have come from supplier innovations described below.

3.3. Supply system

No crop protection pesticide production currently takes place in Mali.[13] Therefore, imports supply the entirety of the national demand for herbicides, insecticides and fungicides. Currently, 5 large firms account for the bulk of pesticide imports into Mali (Table 6). Most of the large importers represent one or more of the major international pesticide companies. Since 2000, when Monsanto's Roundup went off patent, the importers have begun to market its own in-house brands of glyphosate produced for them on demand by laboratories in India or China. Louis Dreyfus Commodities, for example, import Monsanto's Roundup brand of glyphosate as well as its own in-house brand, Glyphader, which it custom orders from factories in China. These major importers belong to the local chapter of CropLife, an international association of pesticide companies formed to promote the availability of quality pesticides. CropLife's advocacy role involves financial support for CNGP meetings and regular advocacy with regulators, particularly about evidence of large-scale counterfeiting sale of unregistered products.

Another 19 small importers also bring in registered pesticides into Mali. In addition to the formally registered firms, a growing array of small clandestine firms operate smuggling operations, bringing in unregistered pesticides from surrounding countries or directly from China using imitation packaging designed to imitate registered brands (Figure 2).

[13] Historically, some pesticide production has taken place in Mali, though these efforts have ceased over the past decade. Beginning in 1974, a state-owned enterprise, the Societé Malienne de Produits Chimiques (SMPC) began a local operation to mix cotton pesticides (primarily insecticides) using imported active ingredients. However, SMPC ceased domestic production in the early 2000s (Camara, 2003). To supply household demand for bug sprays, rodenticides and other household pesticides, three private companies have, at one time or another, produced chemical products for domestic sale. These include the Société de Fabrication de Produits Insecticides au Mali (PRODIMAL), la société de Détergents du Mali (SODEMA) and PRIMA. Currently, importers supply all crop protection pesticides available for sale in Mali.

Figure 2. Crop Pesticide Supply System Structure, Mali 2016

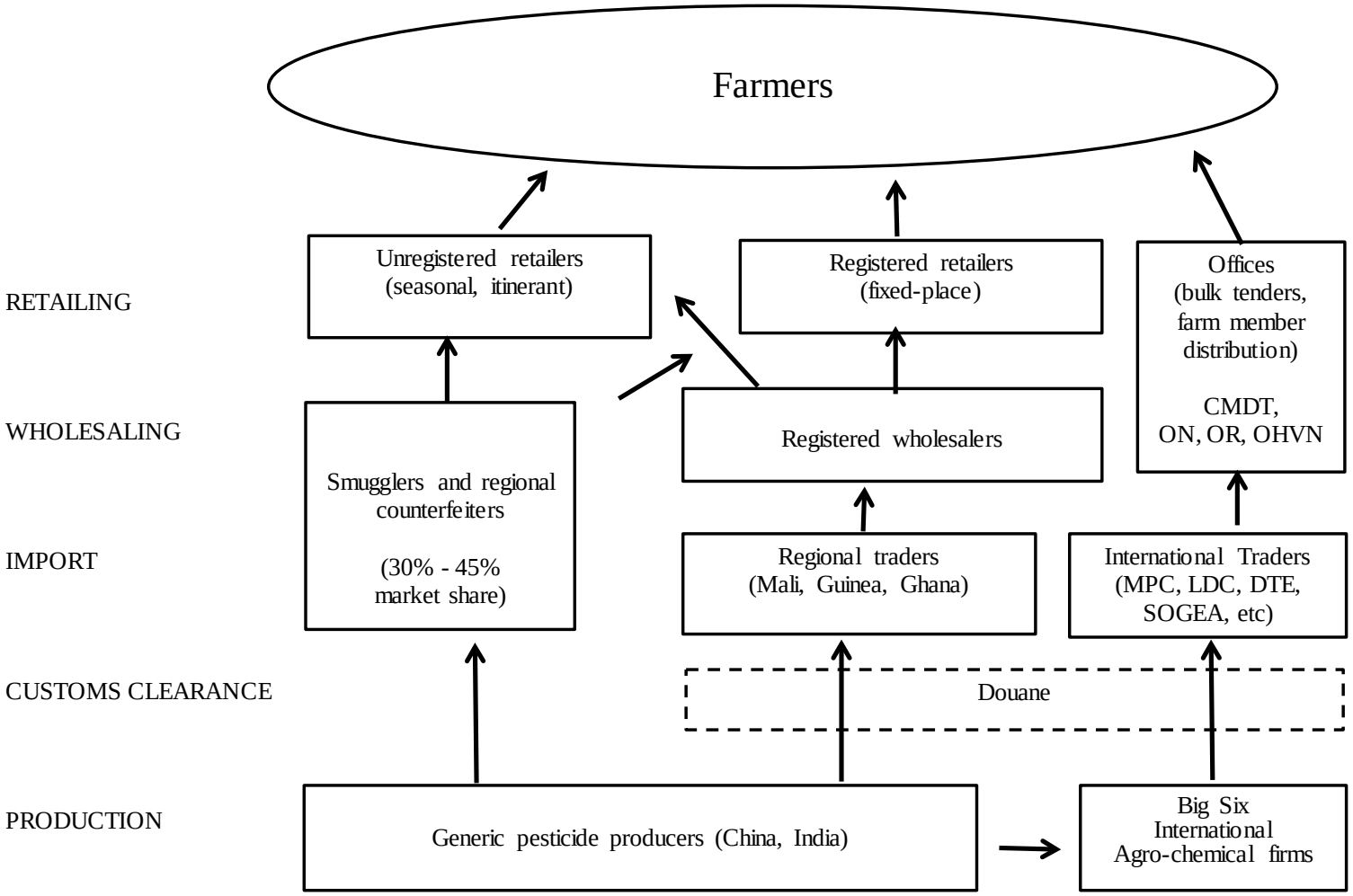


Table 6. Major pesticide importers and distributors

	Number of firms	Key firms
Major importers	5	1. Louis Dreyfus Commodities 2. MPC (Route de Sotuba 3. DTE-Chine 4. SOGEA (Syngenta, Dow AgroSciences, Bayer,AF-Chem) 5. Toguna Agro Industries
Small importers	19	1. AF-CHEM Mali (Route de Sotuba) 2. Agro-tropic (ACI 2000) 3. Arc en ciel (ACI 2000) 4. CIWARA (Immeuble Sylla) 6. Etablissement Issa Mory DEMBELE-Comptoir 2000 7. Etablissement Nafaba 8. Etablissement Satracom 9. Etablissement Souad Distribution 10. Etablissement Winca 11. Etablissement Yara Agrochimie 12. EtablissementMamadou Simpara dit N'FA 13. Gnoumani 14. SIPA- Mali (Badalbougou-Av OUA) 15. Société Africaine de Distribution – SAD (Faladié) 16. Société Al-farouck Service 17. Société Générale D'Agrochimie (Faladié-) 18. Société Malienne des Intrants Agricoles et Services (ACI 2000) 19. Société pour la Commercialisation et la Fourniture des Intrants Agricoles au Mali-SOCAFIAM (ACI 2000)

Source : Croplife.

Thousands of permanent retailers operate agricultural input sales outlets in Mali's major agricultural markets. A recent survey of 16 input markets in four different zones of Mali indicates that herbicides are the most widely supplied inputs among agricultural input providers. Slightly over two-thirds of permanent retailers sold herbicides, while slightly under two-thirds sold mineral fertilizer with roughly one half selling improved seeds (Table 7).

Table 7. Agricultural input retailing density in 16 agricultural markets*

Zones	herbicides	fertilizer	seed
Served by parastatal marketing agencies			
1 Cotton zone (CMDT,OHVN)	76%	61%	48%
2 Irrigated rice zone (ON)	61%	73%	50%
Without parastatal marketing companies			
3 Accessible zones	72%	60%	72%
4 Remote areas	58%	73%	32%
All markets surveyed	68%	66%	51%

*Markets surveyed in each zone include the following:

1) Compagnie Malienne de Dévéloppement des Textiles (CMDT, Sikasso, Koutiala, Fana) and Organization of the Upper Niger Valley (OHVN, Ouéléssebougou)

2) Office du Niger: Niono, Ségou, Macina, Kolongotomo

3) Accessible zones without parastatals: Mopti, Kati, Banamba, Diéma

4) Remote areas without parastatals: Nara, Tominian, Kéniéba, Koro

Source: Diarisso and Diarra (2015).

Support for these input suppliers has come from several sources. With support from AGRA, CNFA (Cultivating New Frontiers in Agriculture, an international non-profit) implemented a three-year Agrodealer Strengthening Program for Mali (ASP-M) from 2008 to 2011. Upon project termination, a local non-government entity, Malimark, began operation to continue the CNFA work in providing training in organization and management skills for agrodealers. Malimark also plays an advocacy role on behalf of Mali's agrodealers. For example, they lobbied successfully to enable agrodealers to pay their 50,000 CFAF licensing fee over 10 months, at 5,000 CFAF per month. Many of the retailers we visited in the market spoke of support they had received from Malimark (Figure 3).

In addition to permanent retailers, an even greater number of part-time, seasonal sellers supply pesticides for sale in Mali's agricultural markets. Many are itinerant traders, operating in multiple markets by travelling to weekly markets in a given zone on specified weekly market days. The heavy interest by part-time and itinerant traders makes estimation of total retailer numbers difficult. The traders we interviewed suggest that weekly markets may swell with as many as 10 times as many part-time traders as permanent vendors.

3.4. Market trends

Over the past 15 years, major structural changes have taken place in Mali's pesticide supply system. The key changes have centered on herbicide suppliers and products. Since 1995, when CPS registered no new herbicide products for sale, the number of new product approvals has growth to 49 in 2015 (Table 2). The pivotal event occurred in September 2000, when Monsanto's Roundup went off patent, triggering a world-wide wave of imitation glyphosate products. Major international agro-chemical companies (including Syngenta, Dow, Bayer and Arysta) have introduced their own glyphosate brands, sold in Mali under trade names such as Kalach, Finish, Mamba Dominator and Touchdown.

More recently, local traders have also entered the herbicide market by introducing their own proprietary brands. In 2008, a Guinean firm (Topex Agro Elevage) registered a new brand of glyphosate, called Glycel, for sale across the CILSS member countries. Manufactured in Mumbai, India, Glycel shifted its packaging from the previous standard of Roundup white and green colors to a yellow bottle with a red cap (Figure 1). Marketed as the "Red Beret", Glycel has become one of the major glyphosate brands sold in Mali (and in Guinea). A series of imitators has copied Glycel's Red Beret packaging by commissioning low-cost manufacturers in China and India to manufacture and package similar-looking glyphosate products. As a result, the regional glyphosate brands introduced by local traders have accounted for the majority of new products introduced over the past decade (Table 8).

Table 8. Trends in number of glyphosate brands registered for sale within Mali

Five-year intervals beginning in	Number of brands registered	
	International*	Regional**
1995	0	1
2000	4	5
2005	2	5
2010	1	16
2015	0	5

* International brands include those produced by the Big Six international pesticide companies: Bayer, BASF, Dow, Dupont, Monsanto and Syngenta.

**Regional brands include those registered by local firms, including products such as Glycel, Touchdown, Glyphonet and Sunoglyph.

Source: Comité Sahélien des Pesticides (CSP).

The explosion of newly registered regional herbicide brands – with its welter of unregistered imitators – has led to widespread smuggling, customs and regulatory evasion. In June 2016, our survey teams identified a total of 25 brands of glyphosate for sale on the Malian market. Of these, roughly half have received regulatory approval (11 by the CSP, 1 by Ghana and 1 from Guinea) while the remaining half have not. As a result, regulators and registered importers have raised increasing concerns about product quality and safety (MIR Plus 2012).

Over the past two decades herbicide imports have grown rapidly, at about 5 percent per year, while insecticide and fungicide imports have increased more moderately, at about 1% per year (Table 4). Over the same period, herbicide prices have fallen while insecticide prices

have trended upwards. Since 2008, Mali's official market information service, the Observatoire du Marché Agricole (OMA), has tracked herbicide prices in a dozen major agricultural markets. Over the period between 2008 and 2015, glyphosate prices for the international glyphosate brand Roundup have fallen slightly, while local brands such as Glyphader have fallen by 30% (Table 9).

Table 9. Glyphosate retail price trends : average annual retail price in 12 markets tracked by Mali's Observatoire du Marché Agricole (OMA)

Brand	2008	2009	2010	2011	2012	2013	2014	2015	C
Price in CFAF/liter									
Kalach 360	4,833	4,313	4,313	2,804	2,958	3,164	3,375	3,125	
Roundup 360	4,833	5,250	4,938	6,000	5,000	4,458	4,479	4,375	
Price in US dollars/liter									
Kalach 360	10.8	9.1	8.7	5.9	5.8	6.4	6.8	5.3	
Roundup 360	10.8	11.1	10.0	12.7	9.8	9.0	9.1	7.4	

Source: Observatoire du Marché Agricole (OMA)

Traders and market regulators we interviewed suggest several possible reasons for falling glyphosate prices:

- increased competition from generics and imitation brands after Roundup went off-patent
- lower-cost suppliers from China and India have entered the market
- smuggling of unregistered brands, which incur no import duties or registration costs
- increased prevalence of lower concentration glyphosates (360 vs 450).

Falling glyphosate prices, in turn, contribute to growing demand for herbicides, particularly as wage labor becomes increasingly scarce in rural areas as young workers move to work in gold mines, elsewhere in the region or in Mali's growing cities.

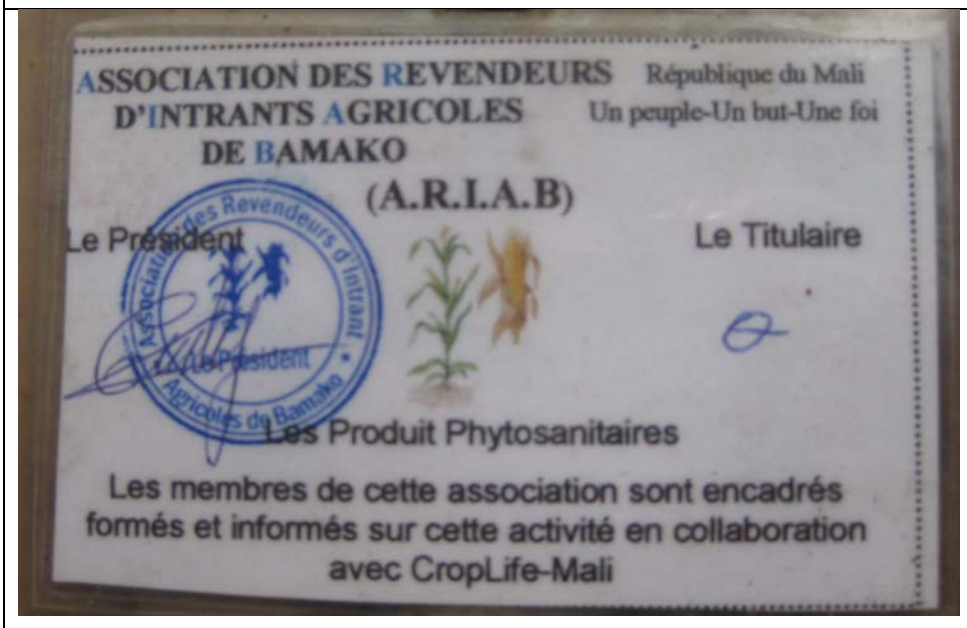
Since the year 2000, pesticide markets in Mali have witnessed three broad trends. First, herbicide prices have fallen over the past decade and a half (Tables 4 and 9). In large part, this softening price results from the expiration of patent protection for Roundup in 2000, increasing competition among the proliferation of locally branded glyphosate products by regional traders and the move to low-cost Asian suppliers. Together, increased availability and falling price have contributed to the growing popularity of glyphosate, which is currently Mali's most popular herbicide.

The second broad trend involves increasing quantities of pesticides imported and applied. Insecticide use has grown moderately, driven by growing insect resistance in cotton fields. Herbicide applications have grown far more rapidly, accounting for the bulk of pesticide quantity growth (Table 4). Falling herbicide prices coupled with growing labor shortages in rural areas have driven rapid growth in herbicide imports. At the farm level, herbicides have become increasingly cost-effective compared to weeding labor as a means of controlling weeds. Farmers are receiving from suppliers more and more pesticide information and its use (directly or indirectly). Some suppliers (Savana, MPC, LDC, etc.) are providing training to CMDT technicians who in turn train farmers. There are also many former IPR students who have become input traders and who are approached by farmers seeking information on

pesticide use. These promotional efforts, training and sensitization have significantly contributed to increase farmers demand of pesticides.

Concerns about product quality and environmental impact constitute the third major trend in pesticide markets. The growing number of unregistered pesticide products sold in Malian markets has led regulators, traders and farmers to worry about possible product quality and possible adulteration. The growing quantities of pesticides (insecticides and herbicides) applied by Malian farmers drive parallel concerns about environmental impacts. The following section assesses the regulatory framework in place to monitor product quality and environmental impact.

Figure 3. Pesticide Retailer Badge



Source: field interviews.

4. IMPLEMENTATION OF REGIONAL PESTICIDE REGULATIONS IN MALI

4.1. Mali's legal framework governing pesticides

Table 10 below details the legal chronology governing pesticide regulations in Mali over the past five decades.

4.1.1. Prior to the CILSS regional pesticide regulations

During the colonial period, a series of crop protection statutes applied in Mali as well as in other parts of French West Africa:

- Decree of 26 January 1926 regulating commerce, stocking and utilization of poisonous substances in French West Africa (J.O.A.) No.120 of 26 March1926)
- Law No.52-1256 of 26 November 1952 relating to the organization of plant protection in French overseas territories • Decree N°55-1219 of 13 September 1955 applying the Law n°52-1256 of 26/11/1952 ;
- Decree No.84 of 13 April 1959 prohibiting the sale of poisonous substances in the Sudan Republique
- Decree No.178 SEAEEF of 2 July 1960 making obligatory the combat against certain animal and plant parasites in the Soudan
- Decree No.182 SEAEEF of 6 July 1960 instituting phytosanitary control on the import and export of plant and plant products

In the post-independence years, a smattering of crop protection laws mentioned pesticides, though only tangentially in relation to regulations governing crop protection agencies and practices. During the 1970s and 1980s, before CILSS adopted a framework for common regional pesticide regulation in 1992, Mali based its national legislation on international norms established by the OAU's African Phytosanitary Council and the FAO International Code of Conduct (Camara et al. 2003). Regulatory reviews by Barberis and Theissen (1989) and Sidibé (2017) identify the following relevant statutes and regulatory orders adopted and affecting pesticide regulations in Mali:

- International convention of crop protection of 6 December 1951, adopted by Mali on 31 August 1987
- Interafrican phytosanitary convention of the OAU, 9 September 1967
- Ordinance No. 87-004/P.RM of 2 April 1987 creating the Service de Protection des Végétaux (SPV)
- Decree No. 100/PG-RM of 29 April 1987 fixing the organization and functioning of SPV

Article 2 of Ordinance No.87-0004 charged the SPV with "control of the quality of phytosanitary products." Article 8 of Decree No.100 authorized SPV determine the conditions of use for phyto-pharmaceutical products. It likewise authorized local administrations to regulate trade in poisonous substances. Article 4 of the colonial law of 1952 mandated that designated crop protection organizations apply insecticide or anti-parasitic treatments as required by SPV.

A review of Malian crop protection and pesticide legislation in 1989 concluded that, "existing legislation on pesticides does not respond to current needs." (Barberis and Theissen 1989, p.13). For example, Decree 100 of 1987 addressed retailing of pesticides but ignored important related issues affecting domestic production and import of pesticides.

Given the incomplete legislative framework existing at the time, the legal consultants recommended preparation of a comprehensive set of new national legislation specifically addressing issues of pesticide regulation. This legislative effort began in 1989 but did not result in approval of a complete body of national pesticide regulations until 1995, in response to the need for national responses to the CILSS regional pesticide regulations of 1992.

4.1.2. Changes in response to the CILSS regional pesticide regulations of 1992

Following the launch of the Comité Sahélien des Pesticides (CSP) in 1994, Mali revised its national pesticide law and implementing regulations in an effort to comply with the CILSS regional pesticide agreements. The location of the CSP secretariat in Bamako considerably facilitated this legislative effort in Mali.

In 1995, Mali's national assembly issued a new law (No. 95-061) covering the regulation, homologation and control of agro-pharmaceutical products. The law specifically required homologation of all such products (Article 4). It stipulated further that the CILSS CSP served as the regulatory review body responsible for determining whether or not to allow registration of specific products (Article 5). The associated implementing regulations (Decree No. 95-404) similarly specified that the CSP would serve as the authorized body for reviewing pesticide product applications and taking homologation decisions (Article 5). Mali's regulations likewise established a national regulatory committee (the Comité National des Produits Agropharmaceutiques) tasked with monitoring implementation at the national level of all CSP decisions (Article 17).

Though timely and clearly aimed at providing national recognition of the regional pesticide regulations, the terminology and definitions in the Malian regulations (and in other member states) posed legal problems for region-wide implementation. Mali's implementing regulations (Decree No. 95-404) defined "agro-pharmaceutical products" as any active substances aimed at combatting organisms harmful to plants, humans or animal health. Although similar to and broadly consistent with the intent of the CILSS regulations, the Malian definition was not exactly the same. Moreover, Mali's regulations contributed to a general problem of differing terminology used by the CILSS member states in drafting their national legislation. While Mali and Senegal adopted the term "agro-pharmaceutical products", others used different terminology: pesticides (in Burkina Faso, Chad and Gambia), phytosanitary products (in Cape Verde) and phyto-pharmaceutical products (in Niger and Guinea Bissau). This inconsistency in terminology and definitions raised the specter of potential legal ambiguity in framing litigation.

Table 10. Mali Policy Chronology

Policy actions	Legal texts	Comments
a. Pre-CILSS pesticide legislation	• Decree of 26 January 1926 regulating commerce of venomous substances in French West Africa • Law No.52-1256 of 26 November 1952 on crop protection in French colonies • Ordinance No. 87-004/P.RM of 2 April 1987 creating Mali's Crop Protection Service (SPV) • Decree No. 100/PG-RM of 29 April 1987 fixing the organization and functioning of SPV	• At independence, Mali inherited a very incomplete legislative framework for regulating pesticides • Early legislation and regulations refer to Inter-african Phytosanitary Council of the OAU and the FAO International Code of Conduct • Drafting of formal pesticide legislation began in 1989 but was not approved until 1995.
b. Mali recognizes but fails to legally ratify the 1992 CILSS regional pesticide regulations (7/27/CM/92)	• Law No.95-061 of 2 August 1995 on the regulation, homologation and control of agro-pharmaceutical products • Decree No.95-404/P-RM implementing Law No.95-061	• Article 5 recognizes authority of the CSP to register pesticides sold in Mali. • Law fails to formally mention CILSS 7/27/CM/92) • Law uses term "agro-pharmaceuticals" rather than "pesticides". • Article 5 stipulates CSP as the authorized registration body. • Article 17 creates National Committee for Agro-pharmaceutical Products to monitor implementation of CSP decisions at national level. Effectiveness is uncertain.
c. Mali ratifies the 1999 CILSS regional pesticide regulations (8/34/CM/99)	• Law n°01– 102 / P-RM of 30 November 2001, ratifying Ordonnance n°01–046 / P-RM of 20 September 2001 authorizing ratification of	• President authorizes adoption of CILSS regulations • National assembly formally ratifies the revised CILSS

Ratification of the 1999 CILSS pesticide regulations by the Malian parliament	the CILSS regional pesticide regulations • Law N° 02/014 of 3 June 2002 governing the homologation and control of pesticides in Mali • Decree No 02-306/P-RM of 3 June 2002 fixing modalities of application under Law No 02/014 of 3 June 2002 • Decision N°02-0674/MAEP-SG of 18 November 2002 naming members of the National Committee for Pesticide Management (CNGP) •Arrêté nº2669/MAEP-SG of 31 December 2002 determining conditions for the issuance of pesticide resale approval	common regulations on pesticides issued in N'Djaména 16 December 1999 • Law uses the term "pesticide", rather than "agro-pharmaceutical products" • Article 6: national pesticide control agencies to enforce sales of only CSP-authorized pesticides • Article 8: any modification of pesticide formulation requires CSP approval
d. Mali operationalizes National Pesticide Committee (CNGP)	• Decree n° 09-313/P-RM of 19 June 2009 fixing application modalities under Law No. 02/014 • Arrêté nº10-4684/MA-SG of 29 December 2010 naming members of the National Committee for Pesticide Management (CNGP-Mali) and of its Permanent Secretariat (DNA);	• Article 2: CSP designated as legal body deciding on homologation of pesticides in Mali. • Article 7: domestic production of pesticides requires review by the ministry of commerce after review by the CNGP . • Article 14: Establishes Comité National de Gestion des Pesticides (CNGP).

	• Arrêté nº11-2221/MA-SG of 09 June 2011 fixing modalities of organization and functioning of the permanent secretariat and the sub-committees of the CNGP	• Article 15: charges CNGP with monitoring national implementation of CSP decisions, including establishment of a national system of toxicological monitoring.
e. **Mali publishes ECOWAS pesticide regulations**	• Regulation C/REG.3/05/2008 harmonizing the rules governing the registration (homologation) of pesticides in ECOWAS	• Published in the Journal Officiel du Mali, no.22 of 30 May 2014

Sources: Camara et al. (2003), Pardo-Leal (1999), Barberis and Theissen (1989), Sidibé (2017).

In response to these inconsistencies, the CSP and FAO worked together to help clarify and standardize the legal language adopted in both the CILSS regulations and in legislation of the individual member states. This region-wide legal review resulted in the adoption of slightly modified pesticide regulations by the CILSS council of ministers in 1999. Table 1 and the discussion in Section 2 above provide details on the specifics of these regional revisions. The discussion below explores Mali's revised legislation.

4.1.3. Malian legislation from 1999 onwards, following revised CILSS regional regulations

With guidance from CSP and the FAO, Mali issued two new pesticide laws conforming to the new CILSS regulations. The first of these (01-102 of November 2001) formally incorporated the CILSS regional pesticide regulations into Malian law. The second (Law No.02-014 of June 2002) detailed the legal framework governing pesticide homologation and control in Mali. To avoid the ambiguity of the 1995 law it replaced, this new law used the term "pesticide" throughout, rather than the more nebulous term "agro-pharmaceuticals". Using the precise definition used by CILSS (and FAO), the new Malian legislation reiterated the primacy of the CILSS CSP in reviewing and sanctioning all pesticides for sale in Mali.

4.2. Implementation

National implementation of the CSP pesticide regulations takes place in three stages: pre-homologation, homologation and post-homologation. Table 11 and the discussion below summarize the national institutions involved in each stage of the implementation process.

4.2.1. Pre-registration

Regulations implementing national pesticide laws have similarly embraced the CILSS CSP. CSP procedures require that firms proposing to sell a new herbicide product in Mali supply detailed information about the active ingredients as well as biological and toxicological properties (CSP 2015). The biological protocols require field testing of product efficacy and selectivity (phyto-toxicity). In Mali, firms proposing new products for sale commission agricultural researchers at Mali's national research institute (IER) to conduct two years of on-station trials plus one year of on-farm trials to assess the biological efficacy and selectivity of

each proposed pesticide. Borne by the proposing firm, these testing costs amount to roughly $8,000 for each product assessed (IER 2013).

Toxicity testing required by the CSP examines pesticide impact on human health, through oral intake, skin contact or inhalation (CSP 2015). Testing labs conduct these analyses on laboratory animals (usually mice). Product submissions made by Malian firms undergo toxicological testing in Burkina Faso due to an absence of certified labs in Mali (Diarisso 2016). Together, the biological and toxicological testing results form a key part of the CSP review materials.

Table 11. Implementing structures and regulatory functions

Regulatory function	**Responsible agency**	**Observations**
Pre-registration		
• testing the biological efficacy of pesticides proposed for registration • toxicity testing	• Institue d'Economie Rurale (IER), Ministry of Agriculture	• company filing for registration pays all testing costs • 3 year testing protocol mandated • toxicity testing conducted in Burkina Faso
Registration		
• review proposed pesticides products for efficacy and safety	• Comité Sahelien des pesticides (CSP)	• Mali sends two representatives to CSP meetings
Post-registration		
• control pesticide imports to ensure that only registered products enter	• Ministry of Commerce, Customs Service	• significant volumes of unregistered pesticides enter Mali fraudulently
• license and monitor traders authorized to sell pesticides	• Ministry of Agriculture, National Department of Agriculture (DNA/LPC), Division of Legislation and Phyotsanitary Control	• central office (in Bamako) licenses traders while local district officers enforce licensing; • local officers often don't have updated lists of authorized traders available to them
• market monitoring to verify that traders sell only registered pesticides	• DNA/LPC	• limited staffing and transport allowances lead to limited monitoring capacity

• enforce labeling requirements	• DNA/LPC	
• control markets, confiscate outdated products	• DNA/LPC	• local officers rarely confiscate pesticides given problems with transport, storage and disposal
• test active ingredients and product quality	• DNA/LPC	• no certified testing laboratory exists in Mali
• disposal of outdated, unregistered pesticides	• Ministry of Environment, Department of Sanitation and Pollution Control	Very weak disposal capacity
• direct national efforts to control locust invasions and grain-eating birds	• Office of Crop Protection (OPV), Ministry of Agriculture	
• monitor environmental impact	Conseil National de Gestion des Pesticides (CNGP)	• no implementation capacity • little effective monitoring takes place
• monitor impact on human health	CNGP	• little effective monitoring takes place

4.2.2. Registration

Mali participates in the CSP regulatory review meetings held twice a year in Bamako. As permanent members of the CSP, Mali sends two members to each technical review meeting. Together with technical representatives of all member states, the CSP reviews applications and issues three categories of decisions on each product application: a) refusal; b) provisional clearance (APV)for three years; or c) full registration for a period of five years and renewable thereafter.

After provisional approval by the CSP, firms technically have three to six years to supply more detailed information on pesticide behavior in the environment (including rates of degradation and mobility in both soil and water), its impact on non-target organisms (including humans, fish, reptiles, algae, birds, bees and soil invertebrates) and residue analysis of affected foods (CSP 2015). In practice, however, the high cost of environmental testing coupled with an absence of certified local testing laboratories results in only cursory assessment of environmental impacts (Cissé 2012).

During its first decade of operation, CSP reviewed 420 applications, roughly half in 1994 and an average of 25 per year thereafter (Abiola et al. 2004). In May 2016, the CSP held its 38th meeting in Bamako. This report provides a detailed listing of pesticide products currently approved for sale in Mali, including both provisional clearance (APV) and fully registered products. Including total herbicides (used in preparing fields for all crops) and selective pesticides used on cotton, rice and maize, the list includes 205 products (Annex 3, Table A3).

4.2.3. Post-registration

Monitoring imports and domestic production.

Traders wishing to import pesticides into Mali must register and request a formal certification (agrément) from by the Ministry of Agriculture's National Department of Agriculture (DNA). Customs officials monitor actual border controls and import procedures, while monitoring of any domestic production, reformulation or packaging become the province of the Ministry of Commerce (Mali 2009). Control of counterfeiting and fraud, likewise, remain the province of Customs Department and Ministry of Commerce.

In practice, traders and officials we interviewed noted significant quantities of unregistered and counterfeit products on sale in Malian markets. In most cases, these involve cross border smuggling. However, some unregistered products on sale appear to involve domestic repackaging (and possible adulteration) of bulk pesticide products into one-liter plastic containers with photocopied labels of varying levels of sophistication. The volume of unregistered products appears to vary by location, with higher concentrations emerging in border areas, particularly along the Ghana and Guinea borders, less along the Ivory Coast and Senegal borders.

Some important subtleties emerged during our field visits. Several traders pointed out that some of the pesticides unregistered in Mali were of high quality and were, in fact, registered elsewhere – in Ivory Coast, Ghana or Guinea. Farmers seem to appreciate pesticides based on the high concentration of active ingredients that gives immediate results, ignoring the future human and environmental effects. As a result, in some cases, farmers preferred specific brands smuggled, high quality pesticides. The forthcoming ECOWAS-wide pesticide regulatory process aims to solve this problem of cross-registration between the coastal and sahelian member states.

Domestic markets.

The crop protection service in Mali's DNA registers pesticide traders and monitors domestic markets. Under Mali's domestic pesticide regulations (Decree No.09/313 of 2009), any trader wishing to sell pesticides requires vetting and registration (agrément) by the DNA. AGRA, CNFA and MaliMark have all assisted in training local agro-dealers about use and safety precautions required in storing and applying pesticides (see Figure 2).

In practice, a large percentage of agricultural input traders sell pesticides without first obtaining a formal authorization (agrément) from the DNA. During the rainy season, seasonal traders enter the market in large numbers. Even a tailor or a haircutter may become an occasional pesticide seller because of the high demand. The share of unregistered traders varies seasonally and by location, depending on the enforcement capacity of the local DNA offices. During our interviews, stakeholders estimated that over half of the small traders operating during the peak season were unregistered, seasonal traders. In some cases, the same "agrément" is photocopied and provided to the input trader's representatives (retailers) operating in remote areas.

DNA likewise monitors major agricultural markets to ensure pesticide product quality and safety. As part of that effort, they inspect trader inventories to ensure that merchants sell only pesticides registered by the CSP and within valid product expiration dates. CSP labelling regulations mandate that each bottle or package of pesticide display the CSP homologation number as well as the product expiration date. Legally, DNA inspectors have authority to confiscate any unregistered or expired pesticide products they find.

In practice, DNA appears to exercise their market control prerogatives intermittently and unevenly. Logistically, the lack of transport, storage and disposal facilities limits DNA's ability to enforce the registration and quality requirement vigorously. Most of the time, the DNA control unit will verbally threaten to confiscate the unauthorized product without actually taking it from the premises. In these cases, the illegal product remains in the hands of the offending trader. Croplife, the formal trade organization of major pesticide importers, has filed numerous complaints with DNA about fraudulent products on sale in local markets. However, most express dissatisfaction with the responsiveness and enforcement capacity at DNA. Some traders claim that firms who complain to the authorities about fraudulent or unregistered products become targets for inspection.

Estimates of unregistered product sales ranged widely. During our interviews various stakeholder estimates of fraudulent products ranged from 20% to 70% of pesticides sold, with a tendency towards the higher estimates in border areas. Farm-level data on herbicide use suggest, as an upper limit, that unregistered herbicides may account for up to 45% of herbicides sold (Table 5). To our knowledge, no comparable quantitative estimates exist for insecticides.[14]

Several banned pesticides appear intermittently on the Malian market. In 2011, CSP banned atrazine and paraquat use in the region. During our farm household surveys in southern Mali, atrazine accounted for 5% of herbide volumes applied (Haggblade et al. 2016). Although atrazine use appears to have declined since the CSP ban, some traders observed that informal sales of atrazine continue primarily because farmers believe that competitor products are not as effective. Similarly, our market visits revealed case lots of paraquat being stocked in some locations. However, we know of no empirical estimates of the volumes of paraquat being sold.

Quality assessment likewise remains highly uncertain. Many of the stakeholders we interviewed – in both the private and public sector – expressed concern about possible adulteration of products. Indeed, the faded photocopies on some unregistered pesticide labels suggest minimal attention to product quality on the part of the counterfeiters. In some cases it appears that the counterfeiter's business model involves delivery of limited edition knockoff brands to local markets for a single season. Even if farmers are dissatisfied with the results, the offending pop-up brands are likely to disappear the following season, as new imitators and new packaging emerge. For farmers and honest traders, quality control becomes problematic.

Currently, no laboratories in Mali are equipped to evaluate the chemical composition of pesticide products or to assess product quality. The consequent absence of regulatory control on product quality weighs heavily on both farmers and suppliers of registered pesticide products. Many of the stakeholders we interviewed consider the problem of counterfeiting, non-registration and lack of quality control to be reaching a critical level, with a danger of adulterated unregistered products damaging farmer confidence in pesticide products as well as compromising environmental and human health.

Safety and environmental monitoring.

Created in 2009, Mali's Comité National de Gestion des Pesticides (CNGP) holds responsibility for monitoring national implementation of CSP decisions, including establishment of a national system of toxicological monitoring. To facilitate enforcement of

[14] Note that studies elsewhere in West Africa estimate levels of counterfeit and fraudulent pesticides ranging between 14% in Côte d'Ivoire to 96% in Burkina Faso (Mir Plus 2012, Table 10).

this broad monitoring mandate, the minister of agriculture presides over the CNGP while the ministers of environment and of health serve as its co-vice-presidents.

Since its creation, the CNGP has not become fully operational. Rather than two annual general meetings, as envisioned, the CNGP has found it difficult to hold even one. In 2015, the private trade group Croplife financed the annual CNGP meeting. Similarly, the two commissions created within the CNGP, one on regulation and control the other on training and information dissemination, have yet to convene, despite plans for quarterly working sessions. In practice, national monitoring of CSP pesticide regulations takes place through the line ministries and departments charged with regulatory oversight. DNA's crop protection service plays the primary regulatory role, assisted episodically by the customs department. Often, the CNGP meetings are attended by different department representatives making it difficult to maintain contunity and to monitor issues of ongoing importance.

Empirical evidence on environmental impacts, likewise, remains scarce in Mali. A small number of studies has examined the impact of insecticides on human health and the environment, particularly in the cotton zones where heavy pesticide use has continued over many decades (Keita 1992, Camara et al. 2003). However, to our knowledge, no studies of the environmental impact of herbicides have taken place in Mali. Instead, international evidence on major herbicide formulations provides the environmental evidence and guidelines on which Sahelian regulators rely.

Looking forward, ongoing concern about insecticide use (particularly in cotton production and in malaria and locust control) appears likely to increase pressure for improved environmental impact monitoring of all pesticides. As herbicide usage continues to grow, and visible signs of empty bottles increasingly litter farm fields, pressure also mounting for information and monitoring of environmental and safety consequences of all forms of pesticides.

Table 12. Staffing and Resources for Implementing Agencies in Mali

Institution	Human resources	Financial resources • budget • fees collected
Institut d'Economie Rurale	• 9 stations and 13 sub-stations conduct pesticide testing	• firms fund testing
DNA/LCP	• 6 regional inspectors • 160 inspectors conduct market inspections	• government operating budget
Comité National de Gestion des Pesticides (CNGP)	• DNA provides CNGP secretariat • 30 CNGP members, 7 private sector, 23 public sector	• relies on government operating budget, often insufficient • private sector sometimes funds annual meetings
Testing laboratories • Soil, plant, water laboratory, Sotuba (IER) • Toxicology and Environmental Quality Laboratory (Central Veterinary Laboratory) • National Health Laboratory	• no labs are currently certified to conduct formulation quality or pesticide toxicity testing • soils lab, no pesticide testing • residue testing • food safety testing, no pesticide testing	

Table 13. Ministerial Structures Involved in Pesticide Control and Regulation

Ministerial units	**Relationship**	**Role**
Ministry of Agriculture		
• Direction nationale de l'agriculture, Division législation et contrôle phytosanitaire (DNA/LCP)	• line ministerial unit	• license pesticide importers, producers and sellers • control markets • develop and enforce legislation
• Office de la protection des végetaux (OPV)	• semi-autonomous office reporting to ministry	• coordinates national efforts to combat invasions of migratory locusts and grain-eating birds
• Institut d'Economie Rurale	• semi-autonomous office reporting to ministry	• conducts pre-homologation biological efficacy tests
Ministry of Environment		
• Department of Sanitation and Pollution Control	• line ministerial unit	• disposal of outdated, unregistered pesticides
Ministry of Commerce		
• Customs office	• line ministerial unit	• enforce duties and control of unregistered pesticide products

5. CONCLUSIONS

Mali's pesticide markets have grown rapidly over the past decade. Herbicide use has increased rapidly, particularly nonselective brands of glyphosate. At the same time, Malian farmers continue heavy insecticide application, particularly in cotton production. These large and growing markets have stimulated a proliferation of new pesticide products and brands along with rising numbers of unregistered products and increased smuggling of counterfeit and fake products. This brand explosion has led to widespread stakeholders worries about product quality and possible product adulteration. Yet no testing of product quality is possible in Mali, given the current state of local laboratory facilities.

To regulate these growing pesticide markets, Malian authorities have consistently aligned national efforts with the CILSS regional pesticide policies. Since 1994, when CILSS first launched the regional CSP, Malian regulators have recognized the CSP's authority to review and vet pesticide products allowed for sale in Mali. National pesticide policy implementation has proceeded primarily through ministerial line agencies such as the Ministry of Agriculture's DNA. In contrast, the umbrella cross-ministerial superstructure envisaged in the CNGP has not become fully functional, leaving line ministries to regulate and monitor pesticide markets as best they can. Budget and staffing shortages constrain regulatory monitoring of traders, markets and pesticide products sold. The absence of national laboratory facilities for conducting toxicology and chemical analysis of pesticide active ingredients and product quality pose an additional constraint to regulatory control efforts. With expanded resources, however, DNA regulators could submit samples for testing in regional laboratories.

To enhance national implementation of regional pesticide policies in the face of rapid market growth, this review has identified three major areas for improvement:

- regulatory coordination between CSP and the coastal zone;
- increased resources for national information, training and regulatory agencies;
- increased sanctions for regulatory and safety violations
- regional collaboration in environmental and pesticide safety monitoring.

Regulatory coordination between CSP and the coastal zone. Currently, regional traders manage to smuggle significant volumes of pesticides into Malian markets, primarily from coastal countries such as Ghana, Guinea and Ivory Coast. Some of these products are of high quality and are duly registered in individual coastal countries. Many of these contraband imports, however, are not registered anywhere and are of doubtful authenticity.

Resolution of this problem will require CSP coordination with coastal country pesticide regulators. In many cases -- particularly with ubiquitous products such as glyphosate -- cross listing in coastal and sahelian countries will significantly facilitate national regulatory efforts. Rather than a series of tedious and time-consuming bilateral discussions, this interior-coastal coordination effort will become feasible only after ECOWAS successfully launches the humid zone pesticide regulatory body envisioned under the 2008 ECOWAS pesticide regulations (ECOWAS 2008). It is unclear from this study what currently constrains the humid zone regulatory launch. Presumably shortages of resources and political will lie at the root of this sluggish implementation of regional regulatory coordination in the coastal countries. Once launched, the sub-regional humid zone pesticide committee will provide a useful partner for CSP regulators in assessing products common to the two zones.

Increased regulatory resources for national information, training and regulatory agencies. Mali's DNA and CNGP confront daunting regulatory mandates with modest human, financial and technical resources. It appears that markets have grown rapidly but without comparable increases in line-item budgets to support parallel expansion of key regulatory agencies. Perhaps the evidence compiled in this study can provide ammunition to internal agencies lobbying for the resources necessary to ensure consumer and environmental safety in the face of growing pesticide use. Regulators require additional resources in order to control markets more actively and improve farmer awareness of proper application and dangers associated with improper use of pesticides and left-over containers.

Increased sanctions. Malian regulators note that fines specified under current legislation are not sufficient to deter the import and sale of unregistered and counterfeit pesticides. Current legislation specifies fines between 100,000 CFAF ($200) and 1,000,000 ($2,000) for import or sale of unregistered pesticides (Loi No.02/014 of 3 june 2002, Article 16). Given the large volumes of unregistered pesticides sold in Mali, small fines of this scale seem unlikely to deter smugglers from their lucrative sale of unregistered products. Although the law also stipulates an alternate sentence of 3 months to 3 years in jail, we are not aware of any application of this sentence. Regulatory authorities have suggested that increasing financial sanctions might help to deter sales of unregistered pesticide products.

Regional collaboration in environmental and safety monitoring. Growing pesticide use, along with increased volumes of untested, unregistered products of unknown quality, has led to broad stakeholder concerns about the quality and safety of pesticide products currently available in Mali. Despite widespread concerns, the environmental impact of this increased volume of pesticide application remains largely unknown and unmonitored in Mali.

These monitoring costs may prove substantial. Given that environmental impacts occur over time, in multiple biological systems (soil, water, humans, insects and mammals), monitoring can quickly become complex and costly. The CILSS model of regional regulatory review, which economizes on scarce scientific personnel and laboratory facilities, has proven efficient in vetting herbicide products prior to release. Regional sampling and studies across common Sahelian agro-ecological zones could perhaps offer parallel economies in environmental monitoring.

The regional model for vetting pesticides prior to authorization, embodied in the CSP, may offer a solution for post-homologation safety and environmental monitoring as well. In the beginning, CILSS organizers initiated the CSP regional regulatory model as a way of pooling limited national resources across multiple countries in order to jointly assess product safety prior to authorizing their sale. Given that the Sahelian countries share common agro-ecological conditions, it may prove possible to manage environmental monitoring in a similar collective way. Regional selection of a sample of representative products and sites could provide a framework for collective monitoring of key environmental and product safety issues. Monitoring of environmental and human health impacts will, of course, require additional public resources. However, collective monitoring of selected sentinel sites seems likely to demand fewer resources than if every member country were to launch a dozen parallel monitoring systems. If pesticide use has grown regionally at the same rapid rate as in Mali, and if the counterfeiting problems assume a similarly wide scale, then the safety and environmental concerns expressed by so many stakeholders suggest that governments will be called upon to respond in order to ensure human safety as well as the sustainability of current agricultural practices.

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Annex 1. Case Study Research Protocol:
Uneven Implementation of Regional Pesticide Policies in West Africa

1. Objectives

• understand why some countries move rapidly to implement agreed-upon regional policies, while others move slowly or not at all.
• formally test Kaleidoscope Model hypotheses about causes of change in policy implementation
• identify key factors favoring country-level implementation of regionally agreed-upon agricultural input policies.

2. Outline for country case studies

1. Introduction
    1.1. Context
    1.2. Objectives
    1.3. Methods

2. Regional pesticide policies
    2.1. CILSS (or ECOWAS) regional pesticide policy
    2.2. Implementation requirements for CILSS (or ECOWAS) member countries

3. Mali market profile
    3.1. Product composition
    3.2. Distribution system
    3.3. Trends

4. Application by Mali (case study country) of regional pesticide regulations
    4.1. Adoption of legal texts
    4.2. Operational implementation
        • pre-homologation
        • homologation
        • post-homologation
5. Conclusions
    • Market trends
    • Implementation of regional policies
    • Main factors affecting the national implementation of agreed regional policies
    • key implementation problems
    • recommendations for improvement

Annex 1. List of persons interviewed
Annex 2. List of registered pesticides

List of Tables

3. Focal point TOR

a. Collect background statistical data (tables 1-10 above and in annex)

1. List and composition of pesticides sold / authorized
2. Trends in volume of pesticides used
3. Price trends (herbicides, insecticides, fungicides)
4. Farmer use of pesticides (based on secondary data)
    - herbicides, insecticides, fungicides
    - selective and nonselective herbicides
5. Glyphosate inventory of registered and unregistered products sold in local markets
6. Timetable of glyphosate brands registered for sale locally
7. Major producers, importers and distributors
8. Policy chronology: national pesticide regulations
9. Implementing structures, regulatory functions and staffing
10. List of key markets

b. Prepare market profile
    - list of key markets (Table 10)
    - list key suppliers (Table 7)
    - list of key purchasers (bulk buyers, government, private sector)
    - list of key regulators (Table 9)
    - list of other important stakeholders

c. Set up key appointments prior to team arrival
d. Conduct follow-up interviews after team departure (on request)
e. Purchase a sample of each glyphosate sold on the market and summarize key information about each (supplier, manufacturer and location, price, etc.)
f. Comments on the draft

4. Field research guidelines

a. Private sector interviews

Step 1. Market profile (FP)

a. Collect background statistical data
- Tables 1-10 above

b. Summarize market structure and participants
- list of key national pesticide markets
- list key suppliers (importers, producers, distributors, local representatives of major suppliers, regional traders)
- list of key regulators
- list of other important stakeholders

Step 2. Identify priority locations and suppliers for interview (FP +team)
Capital city
N = 5 importers
N = all local representatives of major suppliers
N = all bulk buyers
N = all traders operating regionally

N = 2-4 markets
N = 5 wholesalers
N = all producers
N = 10 retailers
N = 1 trade association

Step 3. Conduct interview with key private sector actors (See Interview Guide below)

b. Regulatory system interview

Step 1. Regulatory system overview
• Policy chronology (Table 8)
• copies of key regulations

Step2. Identify key domestic institutions and key informants in each
• national pesticide committee
• regulatory bodies
• scientific
• donors, outside support groups

Step 3. Select key informants to interview
N = ?

Step 4. Interview key public sector stakeholders
(See Public sector Interview Guide)

c. Market-level glyphosate information for each market visited

• list all glyphosate products on sale
• purchase 1-liter bottle of each brand sold on the market• for each product, list the following information

- Manufacturer
- Distributor
- Manufacturing location
- Homologation (Registration) number (if any)
- Price per liter

d. Private Sector Interview Guide

1. Business profile

• when did you start selling/importing pesticides ?
• what major pesticides do you sell?

Tableau 1

	Non Selectif	Selectif (précisez la culture)		
Herbicides				
Insecticides				
Fongicides				

• what category and which specific products do you sell the most of ?

Tableau 2

Category	Most popular products (top 5)	
	Non Selectif	Selectif
Herbicides		
Insecticides		
Fongicides		

• who are your principal clients?
• what role do you play in the supply chain?
  - Importer, wholesaler, retailer, producer
• do you represent one or more suppliers?
• who is your principal supplier?

• who are your principal competitors?
• how many sellers do you compete with?

2. Market structure and evolution

• have quantities sold in your market increased or decreased since you began selling pesticides?
  - Herbicides
  - Insecticides
  - Fungicides
• have the number of importers increased or decreased over time
• have the number of brands increased or decreased over time
• have the number of sellers increased or decreased over time
• on what basis do you compete with other suppliers and brands?
  - Quality? Price? Volume? Service? Credit terms? Packaging?, Advertising?

3. Pesticide policy

• can anyone sell pesticides? what is required?
• have you proposed any specific products for homologation (registration)?
• how long does the homologation (registration) process take?
• what import procedures are required?
• what role do generic herbicides, insecticide play in local markets?
• have you experienced any problem with counterfeiting of herbicides, insecticides?
• Adulteration? Have you found adulterated pesticides being sold? What did you do about it?
• Which generics or counterfeit products compete directly with your principal products?
• Have your costumers ever complained about your products?
• Enforcement capacity?
• How well are pesticides regulated?
• Do you see any major problems in the pesticide market?
• Any recommendations on ways to improve functioning of local pesticide market?

Table 3 For Importers/retailers

Market summary	Major competitor product	Key concerns
Glyphosate		
Other herbicides		
Insecticides		
Fongicides		

E. Policy Makers and Regulators Interview guide

1. Regulatory overview
• list of legally allowed pesticides
- Licensing requirements for pesticides sellers
• national regulators
    - pre-homologation
    - homologation
    - post-homologation

2. National regulations in practice
• import procedures and requirements for pesticides?
• pre-homologation authorisation for testing ?
• homologation decisions
- post-registration decisions
- post-registration monitoring
    - any studies of environmental impact?
    - of impact on human health?
    - Of product quality?
    - Of unregistered pesticides being sold?

• regulatory enforcement ?
• what actions have been taken in past year to control adulterated, outdated or non-homologated pesticides ?
• enforcement capacity : responsible agency; # agents
• testing capacity: labs, names, staffing, capabilities

3. What key regional policy decisions affect pesticide sales here?
• awareness of regional pesticide policies affecting national regulators
• local recognition of regional homologation and testing?
• implementation status of key regional policy decisions
    - implementing laws and regulations
    - CNGP established?
    - CNGP functioning? What regularity? effectiveness

4. Market observations
• quantity trends
• role of generics
• counterfeiting?
• adulteration?
• quality of products sold
• share of unregistered products
    - Herbicides
    - Insecticides

5. Problems and opportunities
• What major opportunities do you see in the pesticide market?
• Do you see any obvious problems in the pesticide market?
• Any recommendations on ways to improve functioning of local pesticide market?

5. Sample tables and format from Mali, Tables 1-10

Tableau 1: List of pesticides authorized for sale in the country (most recent available, 2015 or 2016

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Table 2. Trends in the quantity of pesticides used in the country (total imports into Mali, tons)

Pesticide category	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Herbicides	362	218	359	282	155	459	1,158	1,124	1,408	1,132
Insecticides	2,577	1,598	1,379	2,020	1,656	2,233	1,362	2,392	2,110	1,824
Fongicides	0	0	0	3	15	2	51	28	1,475	134
Autres	37	12	22	236	459	709	67	36	336	965
Total	2,976	1,828	1,760	2,541	2,285	3,403	2,638	3,580	5,329	4,055

Pesticide category	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Herbicides	900	257	1,118	1,031	1,037	2,733	567	1,463	522	1,420
Insecticides	1,935	1,458	2,523	3,315	4,307	3,842	4,426	3,093	1,177	532
Fongicides	86	11	82	63	55	77	87	38	531	176
Autres	36	18	11	10	48	54	103	59	215	175
Total	2,956	1,744	3,733	4,418	5,447	6,706	5,183	4,653	2,446	2,302

Pesticide category	2010	2011	2012	2013	2014	2015
Herbicides	1,066	2,763	2,132	2,660	4,312	
Insecticides	1,488	1,678	3,420	4,798	4,087	
Fongicides	203	807	211	639	369	
Autres	154	284	144	98	536	
Total	2,912	5,532	5,906	8,195	9,305	

Source: DNSI (2000), Camara et al. (2003), INSTAT (2016).

Table 3. Price trends

Table 3a. Import price of pesticides into Mali (‘000 CFAF/liter)

Pesticide category	1990	1995	2000	2005	2010	2014
Herbicides		3.3	4.1	2.6	2.2	1.9
Insecticides	1.2	1.2	2.7	1.6	2.5	1.5
Fongicides		10.0	2.9	2.6	1.9	1.6

Source: DNSI (2000), Camara et al. (2003), INSTAT (2016).

Table 3b. Domestic market prices of pesticides in Mali (CFAF/liter)

	2008	2009	2010	2011	2012	2013	2014	2015
Glyphader 360	4,833	4,313	4,313	2,804	2,958	3,164	3,375	3,333
Roundup 360	4,500	5,250	4,938	6,000	5,000	4,458	4,479	4,500

Source : Observatoire du marché agricole (OMA).

Table 4a. Farmer use of pesticides (herbicides, insecticides, fungicides) based on secondary data

Category	Farmer utilization of pesticides	
	quantity	value
Herbicides		
non-selective (glyphosate, etc)	xx	xx
selective	xx	xx
subtotal	xx	xx
Insecticides		
non-selective	xx	xx
selective	xx	xx
subtotal	xx	xx
Fungicides		
non-selective	xx	xx
selective	xx	xx
subtotal	xx	xx

Source: farm household surveys

Table 4b. Farmer use of selective and nonselective herbicides based on secondary data

Category active ingredient	Product name (farmer reported)	Registration	Crop use	Farmer utilization of herbicides total	 registered	 uncertain
Non-selective						
glyphosate	Beret Rouge	uncertain	all	39,4		39,4
glyphosate	Roundup	yes	all	16,3	16,3	
glyphosate	Glycel	yes	all	7,6	7,6	
glyphosate	Glyphader	yes	all	7,0	7,0	
glyphosate	Kalach	yes	all	2,6	2,6	
glyphosate	Dankoroba	uncertain	all	0,1		0,1
glyphosate	Tripo	uncertain	all	0,5		0,5
subtotal glyphosate				73,5	33,5	40,0
Selectifs (maize, cotton)						
nicosulfuron	Glyco mais	yes	maize	8,7	8,7	
nicosulfuron	diama djigui	uncertain	maize	0,2		0,2
pendimethalin	Stomp	yes	maize/cotton	6,5	6,5	
pendimethalin	Colli	yes	maize/cotton	1,4	1,4	
pendimethalin	Alligator	yes	maize/cotton	0,1	0,1	
atrazine	Atrazine 500	uncertain	maize/cotton	3,0		3,0
atrazine	Accepronte, aceto	yes	maize/cotton	0,5	0,5	
isoxaflutole	Lagon	yes	maize	2,6	2,6	
2,4-D	Super Galant	yes	cotton	0,9		0,9
unknown	various local names	uncertain	maize	2,6		2,6
subtotal selectives				26,5	19,8	6,7
Total				100,0	53,3	46,7

Source: analysis of farm household survey (Smale et al. 2015)

Table 5. Inventory of registered and unregistered glyphosate products sold in local markets

	Product name	Distributor		Manufacturer	Production site	Registration
1	Adopa wura 480	Joyful agro services	Kumasi, Ghana	Zhe Jiang Chemical Corp	Hangzou, China	none
2	Glycel 360	Top-Phyto	Bamako, Mali	Excel Crop Care	Mumbai, India	CILSS, Guinea
3	Glyphader 360 SL	Louis Dreyfus Co.	Bamako, Mali	SCPA SIVEX Intl	Taishun, China	CILSS
4	Glyphodaf 480 SL	Ets SDAGRI	Bamako, Mali	not indicated	not indicated	none
	etc.					

Source: Market visits.

Table 6. Timetable of glyphosate brands registered for sale locally

N°	Nom Commercial	Firmes	Distributeurs	Première APV	Deuxième APV	Première Homologation	Deuxième Homologation
1	Kalach 360 SL (Heros 360 SL)	Calliope	Arysta Lifescience,	0049-A0/He/06-99/APV-SAHEL	0219-A1/He/06-02/APV-SAHEL	0219-H0/He/08-07/HOM-SAHEL	0219-H1/He/08-12/HOM-SAHEL
2	Touchdown 480 SC	Zeneca Agrochemicals	Zeneca Agrochemicals	0087-A0/He/05-00/APV-SAHEL	0259-A1/He/05-03/APV-SAHEL		
3	Glyphogan 480 SL	Agan	Hydrochem CI	0122-A0/He/12-00/APV-SAHEL	0122-A1/He/12-03/APV-SAHEL	0290-H0/He/11-11/HOM-SAHEL	0290-H1/He/11-16/HOM-SAHEL
4	Callifor G	Calliope	Mali Protection des Cultures	0187-A0/He/06-02/APV-SAHEL	0408-A1/He/06-05/APV-SAHEL	0408-H0/He/05-08/HOM-SAHEL	0408-H1/He/05-13/HOM-SAHEL
Etc….							

Table 7. Major producers, importers and distributors

	Number of firms	**Key firms**
Local producers	0	none
Major importers	5	20. Louis Dreyfus Commodities 21. MPC 22. DTE-Chine 23. SOGEA (Syngenta, Dow AgroSciences, Bayer,AF-Chem) 24. Toguna Agro Industries 25. Etc…
Small importers	20	5. Agro-tropic 6. CIWARA 26. Etablissement Issa Mory DEMBELE- Comptoir 2000 27. Etc…
Permanent retailers	??	
Seasonal and occasional retailers	??	

Table 8. Policy chronology: national and regional pesticide regulations

Policy actions	Legal texts	Comments
	1992 CILSS common regulations on pesticide regulation	
Pesticide regulations adopted by the CILSS Council of Ministers of Agriculture (27th session, Ouagadougou, April 7, 1992).	Resolution N° 7/27/CM/92 of the CILSS Council of Ministers of Agriculture	
Regional regulatory review body, the Comité Sahélien des Pesticides (CSP), established (1994)	Resolution N° 10/29/CM/94 concerning the application of regional pesticide regulations adopted by the 29th session of the CILSS Council of Ministers of AgricultureOK (Praia, Cape Verde, April 18 and 19, 1994)	• CSP based at Institut du Sahel (INSAH) in Bamako • CSP meets twice annually • In May 2016, CSP held its 38th regular session in Bamako. • CSP posts the list of all registered pesticides on the INSAH website.
	National ratification of CILSS common regulations	
Mali fails to ratify CILSS 7/27/CM/92		• few countries ratify initial regulations • CILSS requests help from the FAO (1998)
	1999 Revised CILSS pesticide regulations	
Adoption of the revised CILSS pesticide regulations (December 16, 1999)	Résolution N° 8/34/CM/99 adopted by the CILSS Council of Ministers of Agriculture	
	National ratification of CILSS regional regulations	
Ratification of the CILSS pesticide regulations by the parliaments of CILSS member states	**Mali** Loi n°01– 102 / P-RM du 30 Novembre 2001, portant ratification de l'Ordonnance n°01–046 / P-RM du 20 Septembre 2001 autorisant la ratification de la Réglementation commune aux Etats membres du CILSS	• CSP, with FAO support, follows up with individual countries about ratification of the CILSS common regulations
	Loi N° 02/014 du 3 juin 2002 instituant l´homologation et le contrôle des pesticides en République du Mali	
	Décret n° 09-313/P-RM du 19 juin 2009 fixant les modalités d'application de la loi 02/014	

Table 9 Implementing structures, regulatory functions and staffing in Mali

National implementation requirements	**Status of implementation in the country, including structures and staffing**
1. Pre-registration	
• Field testing of pesticides proposed for registration	• IER performs field-based efficacy tests for all pesticides proposed for sale in Mali
• Establish National Pesticide Management Council (CNGP)	• established in 2001 • meets irregularly
2. Registration	
• Country sends representative to bi-annual CSP meetings	• Mali sends representatives since 1994
• CSP approves or disapproves pesticides	• Mali automatically accepts the CSP list of approved pesticides
3. Post-registration	
• register and monitor traders eligible to sell pesticides	• Direction Nationale de l'Agriculture • in practice, many unregistered traders sell pesticides in Mali
• market monitoring to verify that traders sell only registered pesticides, verification of labelling and product expiration dates	• Direction Régionale de l'Agriculture is responsible for market enforcement • meager travel and enforcement budget • limited capacity to store seized products • no list of registered traders available to DRA since registration is done in Bamako
• test active ingredients and product quality	• no capacity, no testing conducted in Mali
• monitor environmental impact	• none
• monitor impact on human health	• none

Source : field interviews.

Table 10. List of key markets selling pesticides (Mali)

Agricultural regions	Main wholesale markets	Main retail markets
Kayes	Kayes-Centre	Kita, Diéma, Badinko
Koulikoro	Koulikoro-Ba	Sirakorola, Dioila, Fana, Kati, Kolokani, Kourémalé, Ouéllessébougou
Sikasso	Sikasso-Centre	Bougouni, Koumantou, Yanfolila, Manankoro, Kadiolo, Zégoua, Koutiala, M'Pessoba, Zangasso, Koury, Yorosso, Kiffosso, Loulouni
Ségou	Ségou	Dioro, Fatiné, Macina, Niono, Diakawèrè, Dogofri, Monimpèbougou, Shiango

Source: Observatoire du marché agricole (OMA)

Annex 2. List of persons interviewed

Bamako

1. Dr Sylvain N. OUEDRAOGO, Secrétaire Permanent du CSP Institut du Sahel Bamako
2. Abdramane SIDIBE, Chargé de Mission à la Direction Nationale de l'Agriculture Ex SP/CNGP
3. Alexis PAMART Directeur Commercial Louis Dreyfus Commodities (LDC) Bamako,
4. Aly Ouologuem, Représentant de DTE à Bamako, Mali
5. Nonon DIARRA Directeur Général SOGEA Représentant Syngenta, Bayer, Dow AgroSciences et AF-Chem
6. Boubacar KONATE, Responsable Commercial Grands Comptes MPC Route de Sotuba
7. Messotigui DIOIMANDE, Directeur Général MPC Route de Sotuba BP 603 Bamako, Mali
8. Dr. Namoye Yaro DIARISSO, Institut d'Economie Rural (IER)
9. Dr. Ousmane CISSE, CMDT
10. Ousmane Martin TRAORE, MaliMark (tel. 76 28 00 85 ou 66 28 00 85 ; e-mail: ousmanet06@gmail.com ou om.traore@malimark.org)
11. M. Youssouf COULIBALY, DG Societé Africaine de Distribution
12. M. Maxime TRAORE, President, Societé Africaine de Distribution
13. M. Bekaye COULIBALY, PDG Wassem-Agri, Bamako
14. Professeur Boubacar Sidike CISSE, Agence Nationale de la Sécurité Sanitaire des Aliments
15. Dr. Daoulé DIALLO BA, ancienne Directrice de la Station Agronomique de Sotuba, ancien expert du CILSS, ancienne représentante de la FAO

Axe Bougouni – Sikasso

1. André FOMBA Secrétaire Général Chambre Régionale d'Agriculture de Sikasso
2. Direction Régionale de l'Agriculture de Sikasso
- Laye DIARRA Chef de la Division Suivi-Evaluation
- Ténéman DIONE Chef de la Division Législation et Contrôle Phytosanitaire
- Nouhoum SAMAKE Chargé de Mission à la Division Législation et Contrôle Phytosanitaire
3. Direction Régionale de l'Assainissement, du Contrôle des Pollutions et des Nuisances (DRACPN) Sikasso
- Alou BARRY Chef de la Division Suivi-Evaluation
- Gaoussou DEMBELE Chef de la Division Assainissement
4. Direction Régionale de la CMDT Sikasso
- Tiéman Dembélé Chef de la Division Production CMDT Sikasso
5. Lassana Berthé Représentant AF-CHEM Mali Sikasso
6. Yaya Berthé Chef de la Représentation de MPC à Sikasso
7. Adama Mallé Chef du Service de la Protection des Végétaux Sikasso
8. Cheikine Dicko, Commerçant Vendeur de Produits Agricoles Marché de Koumantou
9. TOGUNA Bougouni
- Daouda Sangaré Magasinier à Bougouni
- Tiécoura Traoré Magasinier à Bougouni

10. Mamadou Ba Chef de la représentation de MPC à Bougouni
11. Nto Coulibaly Vendeur de pesticides Ouélésséboug ou
12. Mamadou Diarra Vendeur de pesticides Ouélésséboug ou

Axe Koutiala – Fana – Ségou

1. Amidou Goro (num 76369948/66252437), revendeur de pesticides et de semences maraichères à Koutiala
2. Brema Goïta (num 77079970), représentant SOGEA à Koutiala
3. Ali Famanta (num 76116166), revendeur moyen de pesticides à Koutiala
4. BadraAliou Diakité (num 66814181), détaillant de pesticides à Koutiala (patron : Moussa Haidara, 76141462)
5. Seydou Diakité (num 73164352), vendeur d'intrants (semences, engrais, pesticides) à Koutiala
6. Mme Diarra SiraCissoko, Chargé de programme (num 65510067), Mme Coulibaly Awa Keïta, agent DRA (num76371001),AbdramaneSanogo, Chef sous-secteur Agriculture (num 66789155/76789155), Mme Samake Diarra Coulibaly, Chargé du contrôle phytosanitaire (76280512/62363732)
7. Coulibaly Youssouf, Agent de la Protection des végétaux, (num 65240286/90119241)
8. Lassina Dembélé (num 76310665), revendeur demi-grossiste pesticides à Koutiala
9. BrahimaGoïta, revendeur d'intrants (semences, pesticides, cereales), ingénieur agronome, promotion Katibougou 2004, num 73371733/62376757
10. Moustafa Coulibaly, petit détaillant ambulant de pesticides à la foire hebdomadaire de Bla, le jeudi (contact : 79 25 78 60)
11. Koro Kamena, Chef secteur d'agriculture de Bla (contact : 76 21 37 09)
12. MamoudouNantoumé, vendeur détaillant de pesticide à Konobougou(contact : 79257860).
13. AbdramaneSissiko, Société Générale de Business Agricoles (SOGEBA Sarl) à Ségou, vendeur de semences et pesticides, num 65675775, (Contact du coordonnateur de Ségou, Oumar Diarra, num 63169890/78421085)
14. Association des distributeurs d'intrants de Fana compte 33 membres, président Ba Sekou Dembélé, 76109/66108988, membres présents (Bakary Konaté-76266207, Youssouf Diabaté-76132258 représentant de Adama Dembélé, Seydou Dango-76289083, Adama Traoré-79290255)
15. Bakary Konaté, vendeur demi-grossiste d'intrants agricoles (contact : 76266207).
16. Adama Traoré, vendeur détaillant d'intrants agricoles (contact : 79290255).
17. Dinafa Temeta, Sene Jigui (tel 60-67-69-69), agro-dealer, Ségou
18. Ousmane Thera, DG, Agri-SAHEL, Président Mali AgroDealers Association, Ségou

Axe Siguiri – Kourémalé

1. Sina Camara, agro-dealer (tel. 75-31-31-68), Siby, Mali
2. Almamy Idrissa Traoré, agro-dealer, (tel. 75.14.20.43) Narena, Mali
3. Ministry of Commerce Regional Office (Siguiry, Guinea): 10/5/2016
    - group meeting with pesticide traders
    - Ibrahim Camara, Director of Regional Commerce, chairs
    - Foulé Cherif (tel. 622.60.72.64) VP, Chamber of Commerce, Industry and Agriculture
    - 12 pesticide traders participated
    - Bangaly Cherif (tel. 620.32.14.35)
    - Laye Kaba (tel. 23.23.28)
    - Oumar Doumbouya (tel. 622.12.14.16)
    - Sékou Condé (tel. 622.63.65.15)
    - Bassandjo Diarra (tel. 622.37.31.19)
    - Mamadidjan Camara (tel. 622.05.78.71)
    - El Bourlaye Camara (tel. 622.11.61.75)
    - Bréma Camara (tel. 622.12.15.31)
    - Kossa Traoré (tel. 622.30.80.64)
    - Issifou Camara (tel. 622.20.75.76)
4. Sadio Diarra, wholesaler (Siguiry, Guinea): 10/5/2016
5. Ibrahim Camara, wholesaler (Siguiry, Guinea): 10/5/2016
6. Mamadidjan Camara, wholesaler (Siguiry, Guinea): 10/5/2016
7. Ministry of Agricultural, Prefecture Headquarters (Siguiry, Guinea): 11/5/16
    - Abdoulaye Magassouba, Directeur préfectoral de l'agriculture
    - Ismael Kaba, Chef Section, Promotion Agricole
    - Kalifa Traoré, chef section vulgarisation
    - Alphja Doumbouya, inspecteur des marchés agricoles (tel. 622.15.52.03)
8. Chambre de Commerce,d'Industries, de l'Artisinat et de Guinée (CCIAG, Kankan) :11/5/16
    - President Préfectoral, El Hadj Barro (tel. 622.21.75.77)
    - Layej Yakouba Diakité, Président des vendeurs des produits phytosanitaires de Kankan(tél : 622.23.10.47)
    - Laye Alpha Traoré, Sécretaire (tel. 621.36.86.85)
    - Ibrahim Bamba, Sécretaire (tel. 622.32.16.42 or 622.32.46.42)
    - Karim Sacko, Sécretaire (tel. 622.92.93.53 or 664.89.00.59)
9. Direction Régionale de l'Agriculture, Kankan : 12/5/16
    - Karamoko Camara, Directeur Régional de l'Agriculture (tel. 664.93.92.86)
    - 8 staff members also participated ; see list below
10. Yacouba Diakité, importer (Kankan, Guinea): 12/5/16 (tel. 657.58.12.90)

Annex 3: Table A.3. Pesticides authorized for use on cotton (in black), maize (in green), rice (in yellow) ; seed treatments (in cyan) and those containing glyphosate (in pink). Liste Comité Sahélien des Pesticides, Décembre 2015

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
1.	2. K.D SUPER 720SL	III	RMG COTE D'IVOIRE	2.4-D sel d'amine (720 g/l)	0815-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide sélectif de post-levée autorisé contre les dicotylédones annuelles et pérennes en culture de riz pluvial et irrigué
2.	ABSOLUT 90 WG	U	ARYSTA LIFE SCIENCE	Fluométuron (900 g/kg)	0693-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé contre les mauvaises herbes annuelles en culture du cotonnier
3.	ACEPRONET 400 EC	III	DTE	Acetochlore (250 g/l) / Prométryne (150 g/l)	0550-A1/He/06-13/APV-SAHEL Expire en Juin 2016	Herbicide autorisé en post semis pré-levée contre les adventices du cotonnier
4.	ACTION 80 DF	III	SCPA SIVEX INTERNATIONAL (SSI)	Diuron (800 g/kg)	0320-H0/He/11-11/HOM-SAHEL Expire en Novembre 2016	Herbicide autorisé en prélevée contre les dicotylédones annuelles et certaines graminées du cotonnier
5.	AGIL 100 EC	III	ADAMA AGAN LTD	Propaquizafop (100 g/l)	0475-H0/He/11-12/HOM-SAHEL Expire en Novembre 2017	Herbicide de post levée autorisé contre les graminées annuelles et pérennes du cotonnier
6.	AKIZON 40 SC	III	ARYSTA LIFESCIENCE	Nicosulfuron (40 g/l)	0497-H0/He/06-12/HOM-SAHEL Expire en Juin 2017	Herbicide autorisé contre les graminées et les dicotylédones du maïs
7.	ALLIGATOR^{R}	III	SCPA SIVEX INTERNATIONAL (SSI)	Pendimethaline (400 g/l)	0502-H0/He/05-14/HOM-SAHEL Expire en Mai 2019	Herbicide de pré-levée sélectif autorisé contre les mauvaises herbes sur le maïs
8.	ALLIGATOR^{R}	III	SCPA SIVEX INTERNATIONAL (SSI)	Pendimethaline (400 g/l)	0502-A0-X1/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide de pré-levée sélectif autorisé contre les mauvaises herbes sur le cotonnier
9.	ALMECTINE 20 EC				0784-A0/In/05-14/APV-SAHEL	

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
		II	ALM INTERNATIONAL	Emamectine benzoate (20 g/l)	Expire Mai 2017	Insecticide autorisé contre les ravageurs du cotonnier
10.	AMAZONE 10 WP	U	ARYSTA LIFESCIENCE	Pyrazosulfuron –éthyl (100g/kg)	0856-A0/He/12-15/APV-SAHEL Expire en décembre 2018	Herbicide contre les graminées, cypéracées et dicotylédones du riz
11.	APRON STAR 42 WS	III	SYNGENTA	Thiamethoxam (200 g/kg) / Mefenoxam (200 g/kg) / Difenoconazole (20 g/kg)	0297-H1/In,Fo/01-15/HOM-SAHEL Expire en Janvier 2020	Insecticide / Fongicide autorisé contre les insectes et maladies du sol en traitement de semences des cultures
12.	ATTAKAN C 344 SE	II	ARYSTA LIFESCIENCE	Cyperméthrine (144 g/l) / imidacloprid (200 g/l)	0496-H0/In/06-12/HOM-SAHEL Expire en Juin 2017	Insecticide autorisé contre les chenilles phyllophages, carpophages et les pucerons du cotonnier
13.	AVAUNT 150 EC STEWARD 150 EC	III	DUPONT	Indoxacarb (150 g/l)	0609-H0/In/05-13/HOM-SAHEL Expire en Mai 2018	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
14.	AZOX	III	SAVANA	Azoxystrobine (250 g/l)	0762-A0/Fo/11-13/APV-SAHEL Expire en Novembre 2016	Fongicide semi-systémique autorisé contre la pyriculariose foliaire et paniculaire en culture de riz
15.	BACCARA	III	ARYSTA LIFESCIENCE	Propanil (260 g/l) / 2,4-D (175 g/l)	0613-A1/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide autorisé en post levée contre les adventices du riz
16.	BARAKA 432 EC	III	TOPEX AGRO ELEVAGE DÉVELOPPEMENT	Propanil (360 g/l) / triclopyr (72 g/l)	0639-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide sélectif autorisé contre les adventices annuelles et pluriannuels du riz
17.	BELUGA 480 SC	II	ARYSTA LIFESCIENCE	Diflubenzuron (480 g/l)	0671-A1/In/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide autorisé contre les chenilles carpophages et phyllophages du cotonnier
18.	BENEVIA 100 OD	III	DUPONT	Cyantraniliprole (100 g/l)	0676-A0-M1/In/11-13/APV-SAHEL	Insecticide autorisé contre les ravageurs du cotonnier à la dose de 0,4 l/ha

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
					Expire en Novembre 2016	
19.	CAIMAN ROUGE P	II	SCPA SIVEX INTERNATIONAL (SSI)	Perméthrine (25 g/kg) / Thirame (250 g/kg)	0636-A1/In,Fo/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide / Fongicide autorisé contre les champignons pathogènes et les insectes en traitements de semences
20.	CAIMAN B19	II	SCPA SIVEX INTERNATIONAL (SSI)	Emamectine benzoate (19,2 g/l)	0638-A1/In/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide autorisé contre les chenilles phyllophages (*A. flava*, *S. derogata*), carpophages (exocarpiques : *H. armigera*, *E.insulana* et endocarpiques : *C. leucotetreta*, *P. gossypiella*) et les insectes piqueurs suceurs (*Aphis gosspii*, *Bemisia tabaci*, *Empoasca spp.*) des cultures cotonnières
21.	CALFOS 500 EC	II	ARYSTA LIFESCIENCE	Profenofos (500 g/l)	0340-H1/In,Ac/05-13/HOM-SAHEL Expire en Mai 2018	Insecticide acaricide autorisé contre les chenilles phyllophages, carpophages, les piqueurs suceurs et les acariens du cotonnier
22.	CALIFE 500 EC	II	SAVANA	Profenofos (500 g/l)	0478-H0/In/11-12/HOM-SAHEL Expire en Novembre 2017	Insecticide autorisé contre les chenilles phyllophages et carpophages du cotonnier
23.	CALLIFAN EXTRA	II	ARYSTA LIFESCIENCE	Acétamipride (32 g/l) / Bifentrine (120 g/l)	0674-A1/In/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide autorisé contre les insectes piqueurs suceurs et ravageurs du cotonnier
24.	CALLIFOR G	III	ARYSTA LIFESCIENCE	Prométryne (250 g/l) / Fluométuron (250 g/l) / Glyphosate (60 g/l)	0408-H1/He/05-13/HOM-SAHEL Expire en Mai 2018	Herbicide systémique du cotonnier autorisé en pré-levée de la culture et des adventices
25.	CALLIFOR 500 SC	III	ARYSTA LIFESCIENCE	Fluométuron (250 g/l)/ prométryne (250 g/l)	0388-H1/He/05-13/HOM-SAHEL Expire en Mai 2018	Herbicide systémique du cotonnier autorisé en pré-levée de la culture et des adventices
26.	CALLIHERBE 720 SL	II	ARYSTA LIFESCIENCE	Dimethylammonium (720 g/l)	0596-A1/He/06-15/APV-SAHEL Expire en Juin 2018	Herbicide sélectif systémique autorisé contre les dicotylédones annuelles et pérennes du riz

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27.	CALLIHERBE 720 SL	II	ARYSTA LIFESCIENCE	Dimethylammonium (720 g/l)	0596-A0-X1/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide sélectif systémique autorisé contre les dicotylédones annuelles et pérennes du maïs
28.	CALLISTAR 250 EC	III	ARYSTA LIFESCIENCE	Oxadiazon (250 g/l)	0615-A1/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide sélectif autorisé contre les adventices du riz irrigué ou pluvial
29.	CALLISTAR 250 EC	III	ARYSTA LIFESCIENCE	Oxadiazon (250 g/l)	0615-A0-X1/He/12-15/APV-SAHEL Expire en Novembre 2018	Herbicide sélectif autorisé contre les adventices du riz irrigué ou pluvial
30.	CALRIZ	II	ARYSTA LIFESCIENCE	Propanil (360 g/l) / triclopyr (72 g/l)	0597-A1/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé contre les adventices en post-levée du riz
31.	CALTHIO C 50 WS	II	ARYSTA LIFESCIENCE	Thirame (250 g/kg) / chlorpyriphos-éthyl (250 g/kg)	0551-A1/In,Fo/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide / Fongicide autorisé contre les insectes et les champignons en traitement de semences du cotonnier
32.	CALTHIO I 350 FS	II	ARYSTA LIFESCIENCE	Imidacloprid (250 g/l) / thirame (100 g/l)	0604-A1/In,Fo/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide / Fongicide autorisé pour le traitement des semences du cotonnier
33.	CALTHIO MIX 485 WS	II	ARYSTA LIFESCIENCE	Imidaclopride (350 g/kg) / Thirame (100 g/kg) / Metalaxyl (35 g/kg)	0709-A0/In,Fo/05-14/APV-SAHEL Expire en Mai 2017	Insecticide / Fongicide systémique autorisé en traitement de semences de maïs contre les ravageurs du sol
34.	CALTHIO MIX 485 WS	II	ARYSTA LIFESCIENCE	Imidaclopride (350g/kg) / Thirame (100 g/kg) / Métalaxyl (35 g/kg)	0709-A0-X1/In,Fo/05-15/APV-SAHEL Expire en Mai 2018	Insecticide / Fongicide autorisé pour le traitement des semences du cotonnier contre les ravageurs (iules, termites, vers blancs), les insectes piqueurs suceurs et les maladies

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35.	CAMIX 500 SE	III	SYNGENTA CROP PROTECTION AG	Mésotrione (83,3 g/l) / s-métolachlore (416,7 g/l)	0606-A1/He/06-13/APV-SAHEL Expire en Juin 2016	Herbicide autorisé en pré-levée ou post-levée précoce contre les adventices du maïs
36.	CAPT 88 EC	II	ALM INTERNATIONAL	Acétamipride (16 g/l) / Cyperméthrine (72 g/l)	0415-H1/In/11-15/HOM-SAHEL Expire en Novembre 2020	Insecticide autorisé contre les chenilles et les piqueurs-suceurs du cotonnier
37.	COBRA 120 EC	II	ARYSTA LIFESCIENCE	Acétamipride (64 g/l) / Spinétoram (56 g/l)	0647-A1/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les chenilles phyllophages et carpophages et contre les insectes piqueurs-suceurs du cotonnier
38.	CODAL GOLD 412,5 DC	III	SYNGENTA CROP PROTECTION AG	Prométryne (250 g/l) / s-métolachlore (162,5 g/l)	0470-H0/He/06-12/HOM-SAHEL Expire en Juin 2017	Herbicide autorisé en pré-levée contre les plantes adventices du cotonnier
39.	CODAL GOLD 412,5 DC	III	SYNGENTA CROP PROTECTION AG	Prométryne (250 g/l) / s-métolachlore (162,5 g/l)	0470-A0-M1/He/12-15/APV-SAHEL Expire en décembre 2018	Herbicide autorisé en pré-levée contre les plantes adventices du cotonnier
40.	CONQUEST C 88 EC	II	ARYSTA LIFESCIENCE	Acétamipride (8 g/l) / cyperméthrine (80 g/l)	0240-H1/In/07-14/HOM-SAHEL Expire en Juillet 2019	Insecticide autorisé contre les chenilles phyllophages, carpophages et les pucerons du cotonnier
41.	CONQUEST C 176 EC	II	ARYSTA LIFESCIENCE	Acétamipride (32 g/l) / cyperméthrine (144 g/l)	0493-H0/In/11-11/HOM-SAHEL Expire en Novembre 2016	Insecticide autorisé contre les chenilles phyllophages, carpophages et les acariens du cotonnier
42.	CORAGEN 20 SC	IV	ALM INTERNATIONAL	Chlorantraniliprole (200 g/l)	0781-A0/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les chenilles phyllophages et carpophages et contre les insectes piqueurs-suceurs
43.	CORIGNENA 500 EC	III	BARRY AGROCHEM	Metolachlore (333 g/l) / Terbutryne (167 g/l)	0811-A0/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide autorisé en prélevée contre les adventices du cotonnier.

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44.	COTOFORCE 80 WG	U	SCPA SIVEX INTERNATIONAL (SSI)	Prometryne (790 g/kg) / trifloxysulfuron-sodium (10 g/kg)	0673-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide sélectif autorisé en post-levée contre les adventices du cotonnier
45.	COTONET 500 EC	III	DTE	Métolachlore (333 g/l) / terbutryne (167 g/l)	0519-A1/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide autorisé en post-semis et pré-levée contre les mauvaises herbes du cotonnier
46.	CROTALE	II	ARYSTA LIFESCIENCE	Acetamipride (16g/l) / Indoxacarbe (30g/l)	0797-A0/In/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide contre les chenilles, carpophages (Helicoverpa, Earias, Diparopsis), phyllophages (Spodoptera, Cosmiphila) et les insectes piqueurs suceurs du cotonnier
47.	CURACRON 500 EC	III	SYNGENTA CROP PROTECTION AG	Profenofos (500 g/l)	0263-H1/In,Ac/01-14/HOM-SAHEL Expire en Janvier 2019	Insecticide / Acaricide autorisé contre les principales espèces phyllophages et carpophages et les acariens du cotonnier
48.	CRUISER EXTRA COTON 362 FS	III	SYNGENTA CROP PROTECTION AG	Thiamethoxam (350 g/l) / Fludioxonyl (8,34 g/l) / Metalaxyl-m (3,34 g/l)	0643-A1/In,Fo/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide, fongicide autorisé pour le traitement des semences contre les insectes et les champignons
49.	CYPRA 100 EC	II	RIVALE	Cypermethrine (100 g/l)	0659-A0/In/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide autorisé contre les larves de *Helicoverpa armigera* et les mouches blanches
50.	CYPERANET 88 EC	II	DTE	Acétamipride (16 g/l) / cyperméthrine (72 g/l)	0563-A1/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les chenilles phyllophages et carpophages du cotonnier
51.	CYPERCAL P 230 EC	II	ARYSTA LIFESCIENCE	Cyperméthrine (30 g/l) / profenofos (200 g/l)	0227-H1/In,Ac/07-14/HOM-SAHEL Expire en Juillet 2019	Insecticide/Acaricide autorisé contre les chenilles phyllophages, carpophages et les acariens du cotonnier
52.	CYPERCAL P 690 EC	II			0598-H0/In/05-15/HOM-SAHEL	

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
			ARYSTA LIFESCIENCE	Cyperméthrine (90 g/l) / profénofos (600 g/l)	Expire en Mai 2020	Insecticide autorisé conte les chenilles phytophages, carpophages et les insectes piqueurs suceurs du cotonnier
53.	CYPERCAL P 720 EC	II	ARYSTA LIFESCIENCE	Cypermethrine (120 g/l) / profenofos (600 g/l)	0364-H1/In,Ac/11-15/HOM-SAHEL Expire en novembre 2020	Insecticide /Acaricide autorisé contre les principaux insectes carpophages et phyllophages du cotonnier et contre les acariens
54.	CYPERPRONET 690 EC	II	DTE MALI	Profénofos (600 g/l) / cypermethrine (90 g/l)	0555-A1/In/11-15/APV-SAHEL Expire en Novembre 2018	Insecticide autorisé contre les ravageurs du cotonnier
55.	DANGELE	III	DOW AGRO SCIENCES	Haloxyfop R-méthyl (104 g/l)	0414-H1/He/01-15/HOM-SAHEL Expire en Janvier 2020	Herbicide sélectif autorisé en post-levée contre les graminées du cotonnier
56.	DANAYA	II	PARIJAT MALI	Lambda-cyhalothrine (30g/l) / Acetamiprdide (16g/l)	0829-A0/In/12-15/APV-SAHEL Expire en Décembre 2018	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
57.	DELTA TOP 56 EC	U	AGRO VISION SARL	Deltamethrine (24g/l) / Acetamipride (32 g/l)	0869-A0/In/12-15/APV-SAHEL Expire en Décembre 2018	Insecticide contre les insectes phyllophages et carpophages du cotonnier
58.	DEKADE 720 SL	III	ENTREPRISE MULTI SERVICES DU BURKINA FASO (EMUS BF)	2,4-D dimethyl sel d'amine (720 g/l)	0735-A0/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide de post-levée autorisé contre un large spectre de graminées adventices en culture céréalière
59.	DELTACIS 6,25 ULV	II	RIVALE	Deltamethrine (6,25 %)	0868-A0/In/12-15/APV-SAHEL Expire en Décembre 2018	Insecticide autorisé contre les acariens ravageurs des cultures vivrières
60.	DENIM FIT 50 WG MATCH FIT 50 WG	III	SYNGENTA CROP PROTECTION AG	Benzoate d'emamectine (100 g/kg) / Lufenuron (400 g/kg)	0677-A1/In/06-15/APV-SAHEL Expire en Juin 2018	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier

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61.	DENIM SUPER EC	II	ARYSTA LIFESCIENCE	Bifenthrine (60 g/l) / Emamectine benzoate (19 g/l)	0840-A0/In,Ac /05-15/APV-SAHEL Expire en Mai 2018	Insecticide/Acaricide autorisé contre les insectes des genres Helicoverpa, Diparopsis, Earias Spodoptera et les acariens du cotonnier
62.	DIGA FAGALAN FINISH 360 SL	III	SAVANA	Glyphosate (360 g/l)	0480-H0/He/11-11/HOM-SAHEL Expire en Novembre 2016	Herbicide systémique non sélectif autorisé contre les mauvaises herbes annuelles et pérennes avant plantation / semis de toutes cultures
63.	DINAMIC PLUS	III	ARYSTA LIFESCIENCE	Amicarbazone (100g/l) / propisochlore (400g/l)	0686-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide autorisé contre les adventices (graminées et dicotylédones) en post semis et prélevé du maïs
64.	DIURALM 80 WG	III	ALM INTERNATIONAL	Diuron (800 g/kg)	0473-H0/He/11-13/HOM-SAHEL Expire en Novembre 2018	Herbicide de pré-levée autorisé pour lutter contre les adventices du cotonnier
65.	DJIGIKAN 800 EC	III	ALM INTERNATIONAL	Malathion (800 g/l)	0644-A1/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les chenilles phyllophages et carpophages du cotonnier
66.	DOKAT	II	DOBYTRADE SARL	2,4-D sel d'amine (720 g/l)	0845-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide autorisé contre les adventices du riz
67.	DOUMA WORO	II	ETS GNISSIEN & FRÈRES	Glyphosate (480 g/l)	0679-A0/He/05-13/APV-SAHEL Expire en Mai 2016	Herbicide autorisé contre les mauvaises herbes saisonnières, et les herbes permanentes
68.	DURSBAN 4 EC	II	DOW AGRO SCIENCES	Chlorpyriphos-ethyl (480 g/l)	0011-H3/In/07-12/HOM-SAHEL Expire en Juillet 2017	Insecticide autorisé contre les ravageurs des arbres fruitiers, du caféier, du cotonnier, et des cultures maraîchères
69.	DURSBAN 5% DP	III	DOW AGRO SCIENCES	Chlorpyriphos-éthyl (50 g/kg)	0002-H3/In/07-12/HOM-SAHEL Expire en Juillet 2017	Insecticide autorisé contre les sautériaux, les fourmis et les termites en cultures vivrières
70.	DURSBAN 5 G	III	DOW AGRO SCIENCES	Chlorpyriphos-éthyl (50 g/kg)	0003-H3/In/07-12/HOM-SAHEL Expire en Juillet 2017	Insecticide autorisé contre les termites, les fourmis, les noctuelles, les taupins, les vers blancs sur maïs et sorgho

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71.	EFORIA 045 ZC	II	SYNGENTA CROP PROTECTION AG	Thiamethoxam (30 g/l) / lambda-cyhalothrine (15 g/l)	0608-A1/In/06-13/APV-SAHEL Expire en Juin 2016	Insecticide autorisé contre les insectes piqueurs suceurs, les phyllophages et carpophages du cotonnier
72.	EMA 19,2 EC	II	ADAMA MAKHTESHIM LTD.	Emamectine benzoate (19,2 g/l)	0601-A1/In/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide autorisé pour le contrôle des ravageurs du cotonnier
73.	EMA SUPER 56 DC	II	ADAMA MAKHTESHIM LTD.	Emamectine benzoate (24 g/l) / Acétamipride (32 g/l)	0751-A0/In/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide autorisé pour le traitement des champs de cotonniers contre les ravageurs phyllophages et carpophages
74.	EMACOT 019 EC	II	SAVANA	Emamectine benzoate (19 g/l)	0619-A1/In/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide autorisé contre les insectes phyllophages, carpophages et les piqueurs suceurs du cotonnier
75.	EMACOT 050 WG	II	SAVANA	Emamectine benzoate (50 g/kg)	0620-A1/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les chenilles carpophages et phyllophages du cotonnier
76.	EMAPYR	III	SAVANA	Emamectine benzoate (20 g/l) / Pyriproxyfene (60 g/l)	0740-A0/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les ravageurs du cotonnier
77.	EMARON	III	SAVANA	Emamectine benzoate (20 g/l) / Lufenuron (80 g/l)	0792-A0/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les ravageurs du cotonnier
78.	EMIR 88 EC	II	SAVANA	Cyperméthrine (72 g/l) / Acétamipride (16 g/l)	0476-H0/In/05-13/HOM-SAHEL Expire en Mai 2018	Insecticide autorisé contre les chenilles et les insectes piqueurs
79.	EMIR FORT 104 EC	II	SAVANA	Cypermethrine (72 g/l) / Acetamipride (32 g/l)	0653-A1/In/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide autorisé contre les chenilles et les insectes piqueurs-suceurs du cotonnier

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80.	ENGEO 247 SC ALIKA 247 SC	II	SYNGENTA CROP PROTECTION AG	Lambda-cyhalothrine (106 g/l) / Thiamethoxam(141 g/l)	0711-A0/In/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide systémique binaire autorisé contre les insectes piqueurs suceurs, des phyllophages et des carpophages en culture du cotonnier
81.	EUREKA PROPA 360	III	SCPA SIVEX INTERNATIONAL (SSI)	Propanil (360 g/l)	0695-A1/He/11-15/APV-SAHEL Expire en novembre 2018	Herbicide de post-levée sélectif du riz contre les mauvaises herbes annuelles
82.	FANGA 500 EC	II	ALM INTERNATIONAL	Profenofos (500 g/l)	0410-H1/In/11-15/HOM-SAHEL Expire en Novembre 2020	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
83.	FARIMAN	II	PARIJAT MALI	Profenofos (500 g/l)	0828-A0/In/12-15/APV-SAHEL Expire en Décembre 2018	Insecticide autorisé contre les larves, les chenilles et insectes phyllophages et carpophages du cotonnier
84.	FINISH 68 SG	III	SAVANA	Glyphosate (680 g/kg)	0621-A1/He/06-15/APV-SAHEL Expire en Juin 2018	Herbicide non sélectif autorisé contre les adventices annuelles et pérennes avant l'implantation des cultures
85.	FOURALAN 480 SL	III	COMPTOIR 2000	Glyphosate (480 g/l)	0411-H0/He/05-11/HOM-SAHEL Expire en Mai 2016	Herbicide systémique non sélectif autorisé en post-levée contre les adventices annuels et pérennes avant le semis de la culture
86.	FOCUS ULTRA 100 EC	III	BASF SE	Cycloxidim (100 g/l)	0515-H0/He/05-14/HOM-SAHEL Expire en Mai 2019	Herbicide autorisé en post-levée contre les plantes adventices du cotonnier
87.	FUSILADE FORTE 150 EC	III	SYNGENTA CROP PROTECTION AG	Fluazifop-p-butyl (150 g/l)	0467-A0-M1/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide autorisé en post-levée contre les graminées adventices du cotonnier
88.	FUSILADE FORTE 150 EC	III	SYNGENTA CROP PROTECTION AG	Fluazifop-p-butyl (150 g/l)	0467-H0/He/06-12/HOM-SAHEL Expire en Juin 2017	Herbicide autorisé en post-levée contre les graminées adventices du cotonnier

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89.	FLUORALM P 500 SC	III	ALM INTERNATIONAL	Fluométuron (250 g/l) / prometryne (250 g/l)	0376-H0/He/05-13/HOM-SAHEL Expire en Mai 2018	Herbicide de pré-levée autorisé contre les mauvaises herbes monocotylédones et dicotylédones annuelles en culture du cotonnier
90.	GALLANT SUPER	III	DOW AGROSCIENCES	Haloxyfop-R-méthyl (104 g/l)	0268-H1/He/01-15/HOM-SAHEL Expire en Janvier 2020	Herbicide sélectif autorisé contre les graminées du cotonnier en pulvérisation foliaire
91.	GALAXY 450 EC	III	FMC	Clomazone (150 g/l) / Pendiméthaline (300 g/l)	0366-H0/He/11-11/HOM-SAHEL Expire en Novembre 2016	Herbicide autorisé en prélevée contre les adventices annuels du cotonnier et du riz
92.	GARIL 432 EC	II	DOW AGROSCIENCES	Triclopyr (72 g/l) / Propanil (360 g/l)	0010-H0/He/06-12/HOM-SAHEL Expire en Juin 2017	Herbicide autorisé contre les mauvaises herbes en post-levée, du riz pluvial, irrigué et de bas-fonds
93.	GLYCEL 710 SG	II	TOPEX AGRO ELEVAGE DÉVELOPPEMENT	Glyphosate (710 g/kg)	0700-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide systémique non sélectif autorisé en post levée des adventices
94.	GLYCEL 710 SG	II	TOPEX AGRO ELEVAGE DÉVELOPPEMENT	Glyphosate (710 g/kg)	0700-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide systémique non sélectif autorisé en post levée des adventices
95.	GLYCEL 410 SL	II	TOPEX AGRO ELEVAGE DÉVELOPPEMENT	Glyphosate (410 g/l)	0484-H0/He/11-14/HOM-SAHEL Expire en Novembre 2019	Herbicide total systémique autorisé pour lutter contre les adventices annuels et pluriannuels des cultures
96.	GLYPHADER 75 SG	III	SCPA SIVEX INTERNATIONAL (SSI)	Glyphosate (750 g/kg)	0579-H0/He/11-15/HOM-SAHEL Expire en novembre 2020	Herbicide systémique non sélectif autorisé avant la culture contre les adventices annuels et pérennes
97.	GLYPHOTOP 480 SL	U	AGRO VISION SARL	Glyphosate 480g/l	0866-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide autorisé contre les adventices du coton
98.	GLYPHADER 360 SL	U		Glyphosate (360 g/l)	0580-A1/He/06-13/APV-SAHEL	

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	LADABA 360 SL		SCPA SIVEX INTERNATIONAL (SSI)		Expire en Juin 2016	Herbicide systémique non sélectif autorisé contre les adventices en pré semis du cotonnier
99.	GLYPHALM 360 SL	III	ALM INTERNATIONAL	Glyphosate (360 g/l)	0504-H0/He/11-13/HOM-SAHEL Expire en Novembre 2018	Herbicide systématique non sélectif autorisé contre les mauvaises herbes annuelles et pérennes avant plantation / semis de toutes cultures
100.	GLYPHODAF 360 SL	III	SDAGRI	Glyphosate (360g/l)	0838-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide autorisé contre les adventices du coton à la dose 2 l/ha
101.	GLYPHOBAR 480 SL	III	BARRY AGROCHEM	Glyphosate (480 g/l)	0770-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé en post-levée contre les plantes adventices
102.	GLYPHOGAN 480 SL	III	ADAMA AGAN LTD.	Glyphosate (480 g/l)	0290-H0/He/11-11/HOM-SAHEL Expire en Novembre 2016	Herbicide systémique non sélectif autorisé contre les mauvaises herbes annuelles et pérennes avant plantation ou semis de toutes cultures
103.	GLYPHONET 360 SL	III	DTE MALI	Glyphosate (360 g/l)	0440-H1/He/11-15/HOM-SAHEL Expire en Novembre 2020	Herbicide systémique foliaire non sélectif, autorisé contre les adventices annuelles et pérennes
104.	GLYPHOTROP 480 SL	II	TROPICS	Glyphosate (480 g/l)	0656-A1/He/11-15/APV-SAHEL Expire en novembre 2018	Herbicide systémique non sélectif autorisé avant la culture contre les adventices annuelles et pérennes
105.	GLYSAHEL 41 SL	U	SEDAB SARL	Glyphosate (410 g/l)	0725-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide total non sélectif autorisé contre les mauvaises herbes annuelles et pérennes en culture du riz
106.	GRAMI 108 EC	III	ALM INTERNATIONAL	Haloxyfop-R-methyl (108 g/l)	0737-A0/He/05-13/APV-SAHEL Expire en Mai 2016	Herbicide de post-levée autorisé contre un large spectre de graminées adventices en culture de coton
107.	GRANITE 240 SC	II	DOW AGROSCIENCES EXPORT SAS	Penoxsulam (240 g/l)	0722-A1/He/11-15/APV-SAHEL Expire en Novembre 2018	Herbicide post-levée autorisé contre les adventices du riz

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
108.	HALODAF 108 EC	III	SDAGRI	Haloxyfop-R-Methyl (108g/l)	0862-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide sélectif de post-levée pour lutter contre les mauvaises herbes du coton.
109.	HERBALM 720 SL	III	ALM INTERNATIONAL	2,4-D amine (720 g/l)	0377-A1/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide sélectif autorisé contre les mauvaises herbes à feuilles larges du riz
110.	HERBASATE	III	RIVALE	Glyphosate (360 g/l)	0657-A1/He/11-15/APV-SAHEL Expire en Novembre 2018	Herbicide systémique non sélectif autorisé contre les mauvaises herbes
111.	HERBISAHEL	III	SEDAB	Propanil 360g/l	0728-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide contre les mauvaises herbes en culture du riz
112.	HERBEXTRA 720 SL	II	SCPA SIVEX INTERNATIONAL (SSI)	2,4-D Sel de dimethylamine (720 g/l)	0318-H1/He/01-15/HOM-SAHEL Expire en Janvier 2020	Herbicide systémique de post-levée des adventices dicotylédones en culture du riz
113.	HERBO SELECT 108 EC	III	EMUS BF	Haloxyfop-R-methyl (108g/l)	0681-A0/He/12-15/APV-SAHEL Expire en décembre 2018	Herbicide en post-levée contre les mauvaises herbes du cotonnier
114.	HERBO TOTAL 360 SL	III	ENTREPRISE MULTI SERVICES DU BURKINA FASO (EMUS BF)	Glyphosate (360 g/l)	0682-A0/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide non sélectif autorisé en culture du cotonnier
115.	HERBICOTON DF	III	SCPA SIVEX INTERNATIONAL (SSI)	Fluométuron (440 g/l) / Prométryne (440 g/l)	0439-H0/He/11-12/HOM-SAHEL Expire en Novembre 2017	Herbicide autorisé en pré-levée contre les adventices du cotonnier
116.	HERBIMAÏS 240 OF	III	SCPA SIVEX INTERNATIONAL (SSI)	Dicamba (200 g/l) / Nicosulfuron (40 g/l)	0767-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide de post-levée autorisé pour lutter contre les adventices du maïs

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
117.	HERBIRIZ 10 WP	III	ALM INTERNATIONAL	Bensulfuron méthyl (100 g/kg)	0716-A1/He/11-15/APV-SAHEL Expire en Novembre 2018	Herbicide autorisé contre les adventices du riz en post-levée
118.	HERBO TOTAL 360 SL	III	ENTREPRISE MULTI SERVICES DU BURKINA FASO (EMUS BF)	Glyphosate (360 g/l)	0682-A0/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide non sélectif autorisé en prélevée en culture du cotonnier
119.	HITCEL 440 EC	II	TOPEX AGRO ELEVAGE SARL	Profenofos (400g/l) / Cyperméthrine (40g/l)	0865-A0/Ac,In/12-15/APV-SAHEL Expire en Décembre 2018	Insecticide autorisé contre les chenilles des capsules (*helicoverpa armigera*) les chenilles enrouleuses de feuilles, les insectes piqueurs et acariens du coton
120.	IMIDALM T 450 WS	III	ALM INTERNATIONAL	Imidacloprid (350 g/kg) / Thirame (100 g/kg)	0513-H0/In,Fo/05-15/HOM-SAHEL Expire en Mai 2020	Insecticide/Fongicide autorisé en traitement de semences contre les insectes et les maladies du sol du cotonnier
121.	INDOXAN	III	SAVANA	Indoxacarb (50 g/l)	0834-A0/In/05-15/APV-SAHEL Expire en Mai 2018	Insecticide foliaire autorisé pour lutter contre les chenilles ravageuses du cotonnier
122.	IPROSATE 41% SL	U	STÉ BOUTAPA SARL	Glyphosate (410 g/l)	0672-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide systémique non sélectif à large spectre d'action autorisé sur les mauvaises herbes, les graminées pérennes
123.	INSECTOR T	III	SCPA SIVEX INTERNATIONAL (SSI)	Imidacloprid (350 g/kg) / Thirame (100 g/kg)	0616-A1/In,Fo/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide / Fongicide autorisé pour la protection des semences, du stockage à la germination
124.	KABAFLA 710 SE	III	RMG COTE D'IVOIRE	Mésotrione (84 g/l) / Métolachlore (626 g/l)	0816-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide de prélevée ou post levée précoce autorisé pour lutter contre les plantes adventices annuelles du maïs.
125.	KAHIRA	II	PARIJAT MALI		0831-A0/In/12-15/APV-SAHEL	

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
				Emamectine benzoate (5 %)	Expire en Décembre 2018	Insecticide non systemique pour controler les insectes lepidoptere du cotonnier
126.	KALACH 360 SL HEROS 360 SL	III	ARYSTA LIFESCIENCE	Glyphosate (360 g/l)	0219-H1/He/08-12/HOM-SAHEL Expire en Août 2017	Herbicide systémique non sélectif autorisé contre les mauvaises herbes annuelles et pérennes avant plantation / semis de toutes cultures
127.	KALACH EXTRA 70 SG	III	ARYSTA LIFESCIENCE	Glyphosate (700 g/kg)	0533-H0/He/06-12/HOM-SAHEL Expire en Juin 2017	Herbicide systémique foliaire non sélectif autorisé contre les plantes adventices annuelles et pérennes
128.	KILLER 480 SL	U	AF-CHEM SOFACO	Glyphosate (480 g/l)	0752-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide non sélectif autorisé pour le désherbage en post levée des adventices en pré-labour
129.	KOGLYPHO 360 SL	U	ETS AMADOU BAÏBA KOUMA	Glyphosate (360 g/l)	0846-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide total non sélectif autorisé contre les mauvaises herbes, en culture du maïs
130.	K-OPTIMAL	II	SCPA SIVEX INTERNATIONAL (SSI)	Lambda-cyhalothrine (15 g/l) / Acétamipride (20 g/l)	0586-H0/In/11-15/HOM-SAHEL Expire en Novembre 2020	Insecticide autorisé contre les insectes ravageurs du chou et du cotonnier
131.	KOPHOS 500 EC	II	ETS AMADOU BAÏBA KOUMA	Profenofos (500 g/l)	0690-A1/In,Ac/11-15/APV-SAHEL Expire en Novembre 2018	Insecticide acaricide autorisé contre les chenilles phyllophages, carpophages, les piqueurs suceurs et les acariens du cotonnier.
132.	LAGON 575 SC MERLIN COMBI 575 SC	III	BAYER CROPSCIENCE AG	Acloniféne (500 g/l) isoxaflutole (75 g/l)	0753-A0/He/05-14/APV-SAHEL Expire Mai 2017	Herbicide de post semis pré levée autorisé contre les mauvaises herbes du maïs
133.	LAMANET 46 EC	II	DTE	Lambda-cyhalothrine (30 g/l) / acétamipride (16 g/l)	0564-A1/In/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
134.	LAMBDACAL P 636 EC	II	ARYSTA LIFESCIENCE	Lambda cyhalotrine (36 g/l) / Profenofos (600 g/l)	0599-H0/In/05-15/HOM-SAHEL Expire en Mai 2020	Insecticide autorisé contre les chenilles phyllophages carpophages et les insectes piqueurs suceurs du cotonnier
135.	LAMBDACAL P 212 EC	II			0421-H0/In/05-13/HOM-SAHEL	

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
			ARYSTA LIFESCIENCE	Lambda-cyhalothrine (12 g/l) / Profénofos (200 g/l)	Expire en Mai 2018	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
136.	LAMBDACAL P 648 EC	II	ARYSTA LIFESCIENCE	Profénofos (600 g/l) / Lambda-cyhalothrine (48 g/l)	0525-A0/In/05-13/APV-SAHEL Expire en Mai 2016	Insecticide autorisé contre les chenilles carpophages et phyllophages du cotonnier
137.	LAMPRIDE 46 EC	II	SENCHIM	Lambda-cyhalothrine (30 g/l) / Acétamipride (16 g/l)	0500-H0/In/11-13/HOM-SAHEL Expire en Novembre 2018	Insecticide autorisé contre les chenilles phyllophages, carpophages et les insectes piqueurs suceurs du cotonnier
138.	LASER 480 SC	III	DOW AGROSCIENCES	Spinosad (480 g/l)	0265-H1/In/01-15/HOM-SAHEL Expire en Janvier 2020	Insecticide autorisé contre les chenilles phyllophages, et carpophages du cotonnier
139.	LAUDIS 630 SC	III	BAYER CROPSCIENCE AG	Tembotrione (420 g/l) / Isoxadifen-ethyl (210 g/l)	0824-A0/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide de post levée autorisé pour le contrôle des dicotylédones et graminées annuelles en culture du maïs
140.	LIBERATOR 500 SC	III	BAYER CROPSCIENCE AG	Diflufenican (100 g/l) / Flufenacet (400 g/l)	0850-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide autorisé contre les adventices annuelles (graminées dicotylédones, cypéracées) du cotonnier
141.	LUMAX 537,5 SE PRIMAGOLD 537,5 SE	III	SYNGENTA CROP PROTECTION AG	Mésotrione (37,5 g/l) / S-métolachlor (375 g/l) / Terbuthylazine (125 g/l)	0526-A1-/He/06-13/APV-SAHEL Expire en Juin 2016	Herbicide autorisé en prélevée ou post-levée précoce contre les adventices du maïs
142.	LUMAX 537,5 SE PRIMAGOLD 537,5 SE	III	SYNGENTA CROP PROTECTION AG	Mésotrione (37,5 g/l) / S-métolachlor (375 g/l) / Terbuthylazine (125 g/l)	0526-A0-M1/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé à dose réduite (2 l/ha) en prélevée ou post-levée précoce contre les adventices du maïs
143.	MAIA 75 WG	III	ALM INTERNATIONAL	Nicosulfuron (750 g/kg)	0646-A1/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide sélectif autorisé contre les graminées annuelles vivaces et dicotylédones en culture du maïs

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
144.	MAÏA SUPER	III	ALM INTERNATIONAL	Nicosulfuron (60 g/l)	0665-A1/He/06-15/APV-SAHEL Expire en Juin 2018	Herbicide sélectif autorisé contre les graminées annuelles, vivaces et dicotylédones du maïs
145.	MALIK 108 EC	III	SAVANA	Haloxyfop-R-méthyl (108 g/l)	0501-H0/He/05-13/HOM-SAHEL Expire en Mai 2018	Herbicide autorisé contre les graminées en post levée du cotonnier
146.	MAMBA 360 SL DOMINATOR 360 SL	III	DOW AGRO SCIENCES	Glyphosate (360 g/l)	0385-H1/He/07-14/HOM-SAHEL Expire en Juillet 2019	Herbicide systémique non sélectif autorisé contre les graminées et dicotylédonées annuelles et pérennes
147.	MALO BINFAGA 720 SL	II	SAVANA	2,4-D (720 g/l)	0479-H0/He/11-12/HOM-SAHEL Expire en Novembre 2017	Herbicide systémique autorisé en post levée contre les dicotylédones du riz
148.	MEPRODAF 510 EC	III	SDAGRI	Metolachlore (380g/l) / Prométhrine (130g/l)	0863-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide sélectif de prélevée autorisé pour lutter contre les mauvaises herbes du coton
149.	MONCEREN GT 390 FS	II	BAYER CROPSCIENCE AG	Pencycuron (50 g/l) / Thirame (107 g/l) / imidacloprid (233 g/l)	0522-A1/In,Fo/06-15/APV-SAHEL Expire en Juin 2018	Insecticide / Fongicide autorisé en traitement des semences de coton delintées ou vêtues pour lutter contre les parasites des semences et du sol
150.	MOVENTO PLUS	III	BAYER CROPSCIENCE AG	Imidaclopride (120 g/l) Spirotetramat (120 g/l)	0754-A0/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide systémique autorisé contre les piqueurs suceurs du cotonnier
151.	MOMTAZ 45 WS	III	SAVANA	Imidaclopride (250 g/kg) /	0559-H0/In,Fo/11-14/HOM-SAHEL	

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
				Thirame (200 g/kg)	Expire en Novembre 2019	Insecticide / Fongicide autorisé en traitement de semences contre les insectes et les champignons pathogènes du sol
152.	MORAN 30 DF	III	SCPA SIVEX INTERNATIONAL (SSI)	Indoxacarbe (300 g/kg)	0640-A1/In/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide autorisé contre les chenilles phyllophages et carpophages du cotonnier
153.	NICO TOP 40 OD	U	AGRO VISION SARL	Nicosulfuron (40g/l)	0877-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide en post-levée autorisé contre les mauvaises herbes annuelles et les dicotylédones en culture du maïs.
154.	NICODAF	III	ETS SDAGRI	Nicosulfuron (40 g/l)	0800-A0/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide autorisé contre les adventices du maïs
155.	NICOMAIS 40 SC	III	SAVANA	Nicosulfuron (40 g/l)	0491-H0/He/05-13/HOM-SAHEL Expire en Mai 2018	Herbicide autorisé contre les adventices en post-levée du maïs
156.	NICONET 40 SC	IV	DTE Mali	Nicosulfuron (40 g/l)	0707-A1/He/11-15/APV-SAHEL Expire en Novembre 2018	Herbicide systémique autorisé contre les adventices du maïs en post-levée
157.	NOMAX 150 SC	III	BASF SE	Alpha-cyperméthrine (75 g/l)/ Téflubenzuron (75 g/l)	0610-A1/In/05-14/APV-SAHEL Expire en Mai 2017	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
158.	NOMOLT 150 SC	III	BASF SE	Téflubenzuron (150 g/l)	0611-A1/In/11-13/APV-SAHEL Expire en Novembre 2016	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
159.	NOVAC 116 SC	II	ADAMA MAKHTESHIM LTD.	Novaluron (100 g/l) / Acétamipride (16 g/l)	0602-A1/In,Ap/11-14/APV-SAHEL Expire en Novembre 2017	Insecticide autorisé pour le contrôle des ravageurs du cotonnier
160.	OPTIMAL SUPER	III	SCPA SIVEX INTERNATIONAL (SSI)	Indoxacarbe (25 g/l) / Acétamipride (20 g/l)	0694-A1/In/11-15/APV-SAHEL Expire en Novembre 2018	Insecticide autorisé contre les principaux ravageurs des cultures cotonnières

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
161.	OXANET 250 EC	IV	DTE	Oxadiazon (250 g/l)	0802-A0/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide autorisé contre les adventices du riz
162.	PENDAF 500 EC	III	ETS SDAGRI	Pendimethaline (500 g/l)	0839-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide autorisé pour lutter contre la plupart des graminées et dicotylédones en culture de maïs
163.	PENDISTAR	III	SAVANA	Pendimethaline (400 g/l)	0741-A0/He/05-13/APV-SAHEL Expire en Mai 2016	Herbicide de prélevée autorisé pour lutter contre les adventices monocotylédones et certaines dicotylédones en culture de coton
164.	PENDISTAR	III	SAVANA	Pendimethaline (400 g/l)	0741-A0-X1/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide de prélevée autorisé pour lutter contre les adventices moncotylédones et certaines dicotylédones en culture du maïs
165.	PENCAL 500 EC PARAGON 500 EC	II	ARYSTA LIFESCIENCE	Pendiméthaline (500 g/l)	0760-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide autorisé contre les graminées, cypéracées et dicotylédones du cotonnier
166.	PENCAL 500 EC PARAGON 500 EC	II	ARYSTA LIFE SCIENCE	Pendiméthaline (500 g/l)	0760-A0-X1/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé contre les graminées, cypéracées et dicotylédones du maïs
167.	PENDITROP 500 EC	III	TROPICS SARL	Pendimethaline (500 g/l)	0766-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide sélectif autorisé contre les adventices
168.	PINNACLE 360 EC	II	FARM-AG INTERNATIONAL (PTY) LTD	Propanil (360 g/l)	0633-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide autorisé en traitement de poste levé contre les adventices du riz
169.	PIRIPRO 100 EC	III	SCPA SIVEX INTERNATIONAL (SSI)	Pyriproxyphene (100 g/l)	0641-A0/In/05-13/APV-SAHEL Expire en Mai 2016	Insecticide larvicide et ovicide autorisé pour la protection des cultures cotonnières
170.	POWER	III	SAVANA	Diuron (800 g/kg)	0835-A0/He/05-15/APV-SAHEL	

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
					Expire en Mai 2018	Herbicide systémique de prélevée autorisé pour lutter contre l'ensemble des adventices du coton
171.	PRODAS POWER	U	DOBYTRADE SARL	Glyphosate (450 g/l)	0844-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide autorisé contre les adventices en prélevée du riz
172.	PROFENET 500 EC	II	DTE	Profénofos (500 g/l)	0554-A1/In/06-13/APV-SAHEL Expire en Juin 2016	Insecticide autorisé contre les insectes phyllophages et carpophages du cotonnier
173.	PYRINEXQUICK 424 EC	II	ADAMA MAKHTESHIM LTD.	Deltamethrine (24 g/l) / Chlorpyriphos-éthyl (400 g/l)	0438-H0/In,Ac/11-13/HOM-SAHEL Expire en Novembre 2018	Insecticide / Acaricide autorisé contre les chenilles phyllophages, carpophages et les acariens du cotonnier
174.	PYRINEXQUICK 212 EC	II	ADAMA MAKHTESHIM LTD.	Deltaméthrine (12 g/l) / Chlorpyriphos-éthyl (200 g/l)	0437-H0/In,Ac/11-12/HOM-SAHEL Expire en Novembre 2017	Insecticide / Acaricide autorisé contre les chenilles phyllophages, carpophages et les acariens du cotonnier
175.	RAINBOW 25 OD	III	DOW AGROSCIENCES	Penoxsulam (25 g/l)	0603-A1/He/06-13/APV-SAHEL Expire en Mai 2016	Herbicide autorisé en post-levée contre les adventices en riziculture irriguée et de bas-fonds
176.	RISTAR 250 EC	III	SCPA SIVEX INTERNATIONAL (SSI)	Oxadiazon (250 g/l)	0733-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide de pré-levée autorisé pour la lutte contre les adventices du riz (graminées annuelles, dicotylédones et cypéracées)
177.	RIVAL 360 SL	III	SEMBIOS LLC	Glyphosate (360 g/l)	0668-A1/He/11-15/APV-SAHEL Expire en Novembre 2018	Herbicide total, non sélectif autorisé pour le contrôle des adventices (graminées et dicotylédones) sur toutes cultures
178.	RIVORMONE 720 SL	II	RIVALE	2,4-D (720 g/l)	0658-A1/He/11-15/APV-SAHEL Expire en Novembre 2018	Herbicide systémique de post-levée autorisé contre les dicotylédones de riz
179.	ROUNDUP 680 BIOSEC	III	MONSANTO	Glyphosate (680 g/kg)	0261-H1/He/11-15/HOM-SAHEL	

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
					Expire en Novembre 2020	Herbicide systémique foliaire non sélectif autorisé contre les mauvaises herbes annuelles et pérennes avant semis de toutes cultures
180.	ROUNDUP 360 K	III	MONSANTO	Glyphosate (360 g/l)	0617-A1/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé en post-levée contre les mauvaises herbes annuelles et pérennes avant semis des cultures
181.	ROUNDUP 450 TURBO K	III	MONSANTO	Glyphosate (450 g/l)	0618-A1/He/05-14/APV-SAHEL Expire Mai 2017	Herbicide autorisé en post-levée contre les mauvaises herbes annuelles et pérennes avant semis des cultures
182.	ROUNDUP POWERMAX	III	MONSANTO	Glyphosate (540 g/l)	0553-A1/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide systémique non sélectif autorisé contre les mauvaises herbes annuelles et pérennes avant plantation ou semis de toutes cultures.
183.	RUBIS	III	SAVANA	Bispyribac – sodium (100 g/l)	0795-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide de post levée autorisé pour la culture de riz
184.	SAHEL 2D	II	SEDAB	2,4 D (720 g/l)	0878-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide autorisé contre les mauvaises herbes en culture riz
185.	SEGAIBANA 40 SC	U	BARRY AGROCHEM	Nicosulfuron (40 g/l)	0771-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé contre les adventices graminées et dicotylédones du maïs
186.	SAMORY	III	SCPA SIVEX INTERNATIONAL (SSI)	Bensulfuron – méthyl (100 g/kg)	0514-H0/He/06-15/HOM-SAHEL Expire en Juin 2020	Herbicide autorisé contre les plantes adventices (graminées, dicotylées et cypéracées) du riz
187.	SELECT 120 EC	III	ARYSTA LIFESCIENCE	Cléthodime (120 g/l)	0444-H1/He/01-15/HOM-SAHEL Expire en Janvier 2020	Herbicide sélectif autorisé en post-levée contre les graminées du cotonnier
188.	SNIPER	II	ARYSTA LIFE SCIENCE	Pendiméthaline (300 g/l) / Clomazone (150 g/l)	0796-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé contre les adventices graminées, cypéracées et dicotylédones du cotonnier et du riz

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
189.	SOFA	IV	AF CHEM-SOFACO	Nicosulfuron (40 g/l)	0791-A0/He/05-15/APV-SAHEL Expire en Mai 2018	Herbicide autorisé contre les adventices du maïs
190.	SOLITO 320 EC	III	SYNGENTA CROP PROTECTION AG	Pyribenzoxim (20 g/l) / Prétilachlore (300 g/l)	0541-H0/He/11-15/HOM-SAHEL Expire en Novembre 2020	Herbicide autorisé contre les mauvaises herbes du riz
191.	SOFIT 300 EC	III	SYNGENTA CROP PROTECTION AG	Pretilachlore (300 g/l)	0540-A1/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide sélectif autorisé contre les adventices du riz pluvial
192.	SUNPHOSATE 360 SL	III	WYNCA SUNSHINE	Glyphosate (360 g/l)	0669-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide non sélectif autorisé pour la lutte contre les graminées annuelles et les dicotylédones
193.	STOMP 455 CS	III	BASF SE	Pendiméthaline (455 g/l)	0591-A0-X2/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé contre les adventices en pré-levée en culture de riz
194.	STOMP 455 CS	III	BASF SE	Pendiméthaline (455 g/l)	0591-A1/He/06-13/APV-SAHEL Expire en Juin 2016	Herbicide autorisé contre les adventices en pré-levée du maïs
195.	STOMP 455 CS	III	BASF SE	Pendiméthaline (455 g/l)	0591-A1-X1/He/11-14/APV-SAHEL Expire en Novembre 2017	Herbicide autorisé contre les adventices en pré - levée de la culture du cotonnier
196.	SNIPER	II	ARYSTA LIFE SCIENCE	Pendiméthaline (300 g/l) / clomazone (150 g/l)	0796-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide autorisé contre les adventices graminées, cypéracées et dicotylédones du cotonnier et du riz
197.	TENOR 500 EC	II	SENCHIM	Profenofos (500 g/l)	0325-H1/In/05-13/HOM-SAHEL Expire en Novembre 2018	Insecticide autorisé contre les chenilles phyllophages et carpophages du cotonnier
198.	TERBULOR 500 EC	II	ADAMA AGAN LTD.	Terbutryne (167 g/l) / Métolachlore (333 g/l)	0790-A0/He/05-14/APV-SAHEL Expire en Mai 2017	Herbicide de prélevée autorisé contre les adventices annuelles en culture du maïs

N°	Spécialité commerciale	Classe OMS	Firme	Matière(s) active(s)	Numéro et date d'expiration	Domaines d'utilisation
199.	TERICOT 500 SC	III	RMG Côte d'Ivoire	Prométhrine (250g/l) / Métolachlore (250g/l)	0817-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide de prélevée et post levée précoce autorisé contre les adventices annuelles ou pérennes du cotonnier
200.	THUNDER 145 O-TEQ SOLOMON 145 O –TEQ	II	BAYER CROPSCIENCE AG	Imidalcloprid (100 g/l) / Betacyfluthrine (45 g/l)	0492-H0/In/11-13/HOM-SAHEL Expire en Novembre 2018	Insecticide autorisé contre les chenilles carpophages, phyllophages et les piqueurs suceurs du cotonnier
201.	TIHAN 175 O-TEQ MOVENTO TOTAL 175 O-TE	III	BAYER CROPSCIENCE AG	Flubendiamide (100 g/l) / Spirotetramate (75 g/l)	0552-H0/In/11-14/HOM-SAHEL Expire en Novembre 2019	Insecticide autorisé contre les ravageurs du cotonnier
202.	TOPSTAR 400 SC RAFT 400 SC	III	BAYER CROPSCIENCES AG	Oxadiargyl (400 g/l)	0332-H1/He/08-12/HOM-SAHEL Expire en Août 2017	Herbicide autorisé contre les adventices du riz pluvial et riz irrigué et repiqué
203.	TOPEXTRA 720 SL	II	TOPEX AGRO ELEVAGE DÉVELOPPEMENT	2,4 D sel d'amine (720 g/l)	0701-A0/He/11-13/APV-SAHEL Expire en Novembre 2016	Herbicide sélectif autorisé en post- levée contre les adventices du riz
204.	TOUCHDOWN FORTE 500 SL	III	SYNGENTA CROP PROTECTION AG	Glyphosate (500 g/l)	0469-H0/He/11-12/HOM-SAHEL Expire en Novembre 2017	Herbicide systémique non sélectif autorisé contre les mauvaises herbes annuelles et pérennes avant plantation ou semis
205.	ZOOMER 390 SC	III	ADAMA WEST AFRICA	Oxyfluorfen (30 g/l) / glyphosate (360 g/l)	0710-A0/He/12-15/APV-SAHEL Expire en Décembre 2018	Herbicide total et systémique autorisé pour le contrôle des mauvaises herbes annuelles et pérennes en culture du cotonnier.

Annex 4. Statistical annex

Table A4.1. Trends in pesticide imports into Mali

Type de pesticide	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
A. Volume (tonnes)																									
Herbicides	362	218	359	282	155	459	1,158	1,124	1,408	1,132	900	257	1,118	1,031	1,037	2,733	567	1,463	522	1,420	1,066	2,763	2,132	2,660	4
Insecticides	2,577	1,598	1,379	2,020	1,656	2,233	1,362	2,392	2,110	1,824	1,935	1,458	2,523	3,315	4,307	3,842	4,426	3,093	1,177	532	1,488	1,678	3,420	4,798	4
Fongicides	0	0	0	3	15	2	51	28	1,475	134	86	11	82	63	55	77	87	38	531	176	203	807	211	639	
Autres	37	12	22	236	459	709	67	36	336	965	36	18	11	10	48	54	103	59	215	175	154	284	144	98	
Total	2,976	1,828	1,760	2,541	2,285	3,403	2,638	3,580	5,329	4,055	2,956	1,744	3,733	4,418	5,447	6,706	5,183	4,653	2,446	2,302	2,912	5,532	5,906	8,195	9
B. Valeur (millions de CFAF)																									
Herbicides	0	0	0	422	534	1,515	3,543	3,237	4,454	3,903	3,715	1,038	4,259	3,326	3,322	7,174	1,668	3,133	1,124	3,055	2,306	5,611	4,105	5,318	8
Insecticides	3,157	1,246	1,300	1,390	3,321	2,774	2,665	5,666	5,400	4,953	5,295	3,261	7,635	7,898	10,227	5,970	7,237	4,868	2,399	1,084	3,723	3,308	10,278	8,309	5
Fongicides	716	512	616	7	140	20	393	88	304	97	248	42	286	245	91	201	230	201	886	314	393	1,290	582	1,079	
Autres	305	16	24	260	1,234	4,117	211	60	1,381	3,163	69	128	32	18	34	46	93	82	105	164	364	143	311	211	
Total	4,178	1,774	1,940	2,079	5,229	8,426	6,812	9,051	11,539	12,116	9,327	4,470	12,213	11,487	13,674	13,391	9,227	8,283	4,514	4,617	6,787	10,352	15,276	14,917	15
C. Prix ('000 CFAF/litre)																									
Herbicides					3.4	3.3	3.1	2.9	3.2	3.4	4.1	4.0	3.8	3.2	3.2	2.6	2.9	2.1	2.2	2.2	2.2	2.0	1.9	2.0	
Insecticides	1.2	0.8	0.9	0.7	2.0	1.2	2.0	2.4	2.6	2.7	2.7	2.2	3.0	2.4	2.4	1.6	1.6	1.6	0.1	0.1	2.5	2.0	3.0	1.7	

Source: DNSI (2000), Camara et al. (2003), INSTAT (2016).

Annex 5. Test of Kaleidoscope hypotheses about factors affecting policy implementation

			Policy actions				
			a	b	c	d	e
		Regional pesticide regulations	Pre-CILSS	CILSS 1992 7/27/CM/92	CILSS 1999 8/34/CM/99	CILSS 1999 8/34/CM/99	ECOWAS 2008
		Malian policy actions: date	1952	1995	2001, 2002	2009	2008
		goal	crop protection	attempted CILSS ratification	successful ratification	create CNGP	publish ECOWAS regulations
		legal instrument	French Law No.52-1256 applicable in all French colonies	Law No.95-061 Decree No.95-404/P-RM	Law No. 01-102/P-RM of 30/11/2001 Law No. 02/014 of 3/6/2002	Decree No.09-313/P-RM	C/REG.3/05/2008 C/REG.3/05/2008
Determinants of Policy Change							
Policy stage	**Kaleidoscope model hypotheses**						
Agenda setting	1	Recognized, relevant problem	+	+		+	
	2	Focusing event		+	+		+
	3	Powerful advocates		+	+	?	?
Design	4	Knowledge and research		?	+		?
	5	Norms, biases, ideology, beliefs		+	+		
	6	Cost-benefit calculations		+	+		
Adoption	7	Powerful opponents vs. proponents		?	?	?	?
	8	Government veto players		+	+	?	?
	9	Propitious timing					
Implementation	10	Requisite budget				-	
	11	Institutional capacity			-	-	
	12	Implementing stage veto players					
	13	Commitment of policy champions					-
Evaluation & reform	14	Changing information and beliefs		+			
	15	Changing material conditions			+		
	16	Institutional shifts		+			

Legend:

+	significant positive influence
	no influence
-	significant negative influence