



# SOY MORATORIUM



2016/2017 CROP YEAR

## EXECUTIVE SUMMARY

The Soy Moratorium is a pioneering initiative that is recognized nationally and internationally for its efficacy in fighting deforestation associated with soy production in the Amazon Biome<sup>1, 2</sup>. A relevant aspect of this initiative lies in the fact that its objective is very focused and has been shown to be effective in aiding the reduction of deforestation in the Amazon Biome, in an environment of rapid soy expansion in Brazil.

This effectiveness is substantiated by the strict monitoring of satellite images that identify soy crops not in compliance with the Soy Moratorium. When the monitoring began, the reference date was set as July 24, 2006, the day the Soy Moratorium was signed, but was altered to July 22, 2008 when the Brazilian Forest Code<sup>3</sup> was approved. The GTS, formed by ABIOVE's and ANEC's member-companies, civil society organizations, the Ministry of the Environment and the Bank of Brazil, is responsible for the Moratorium's governance and operations.

The pact's success is also due to the considerable stock of land in the Amazon region that was cleared before the Soy Moratorium's reference date, making soy expansion into already deforested areas feasible and showing it is possible to reconcile increased agricultural production with a reduction in deforestation. During the Moratorium, soy acreage more than tripled in the Amazon Biome and it is currently responsible for 13% of Brazil's total soy acreage<sup>4, 5</sup>.

In the Amazon Biome, the vast majority of soy (97%) is grown in the 89 municipalities that make up the 2016/2017 crop study area in seven states: Mato Grosso, Pará, Rondônia, Roraima, Amapá, Maranhão and Tocantins. Based on annual estimates by INPE's PRODES<sup>6</sup> program, 839,389 deforested hectares (3,241 square miles) were identified in these municipalities between the Soy Moratorium's new reference date (July 22, 2008) and PRODES' most recent evaluation in 2016. This area corresponds to approximately 20% of the deforestation observed in the Amazon Biome during the Moratorium.

In the 2016/2017 crop year, 47,365 hectares (183 square miles) were identified with soy that did not comply with the Soy Moratorium, and was planted in areas mapped by PRODES that were deforested between 2009 and 2016. This area corresponds to 1.0% of the total soy acreage in the Amazon Biome for the 2016/2017 crop year and to 1.2% of the total area deforested during the Moratorium. Therefore 98.8% of the region's deforestation is not associated with converting forest into soy. This same area (47,365 hectares) represents 5.6% of the deforested area in the 89 monitored municipalities. It should be emphasized that just nine of these municipalities concentrate 62% of the soy that does not comply with the Soy Moratorium.

This report describes the methodology used and presents the results of the soy monitoring program in the Amazon Biome for the 2016/2017 crop year, in the context of the Soy Moratorium. The Appendix contains detailed information on the deforested polygons with soy crops that are not in compliance with the Moratorium.

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# LIST OF ABBREVIATIONS

<b>ABIOVE</b>	Brazilian Vegetable Oil Industries Association
<b>ANEC</b>	National Grain Exporters Association
<b>CEI</b>	Crop Enhancement Index
<b>CONAB</b>	National Supply Company
<b>EVI</b>	Enhanced Vegetation Index
<b>FUNAI</b>	National Native Indians Foundation
<b>GTS</b>	Soy Working Group
<b>IBGE</b>	Brazilian Geographic & Statistical Institute
<b>INCRA</b>	National Colonization & Agrarian Reform Institute
<b>INPE</b>	National Space Research Institute
<b>MMA</b>	Ministry of the Environment
<b>PPCDAM</b>	Action Plan for Prevention & Control of Deforestation in the Amazon
<b>PRODES</b>	Program to Calculate Deforestation in the Brazilian Amazon

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# 1

## INTRODUCTION

The Soy Moratorium was signed on July 24, 2006 with the intention of inhibiting the expansion of soy production into the Amazon Biome's tropical forest.

When the new Forest Code<sup>3</sup> was sanctioned on May 25, 2012, the Soy Moratorium's reference date was altered to July 22, 2008, starting with the 2012/2013 crop year. At the same time, several technological advances made since the Moratorium began were gradually incorporated into the methodological procedures, thus improving the monitoring of the area. In this 2016/2017 crop year, the new municipality-selection procedure merits a mention; it was based on a detailed and innovative mapping of soy crops using remote sensing satellite images of the Amazon Biome<sup>5</sup>.

Monitoring in the context of the Soy Moratorium uses a vast collection of remote sensing satellite images obtained through sensors with complementary spatial and temporal resolutions, which are analyzed by an experienced team of interpreters. To complement the analyses made during the monitoring process, the PRODES<sup>6</sup> database for deforestation occurring in the Amazon Biome during the Soy Moratorium is also used, in addition to the databases of the following institutions: Agrosatélite<sup>5</sup>, FUNAI<sup>7</sup>, Ministry of the Environment<sup>8</sup>, IBGE<sup>9</sup> and INCRA<sup>10</sup>, as the Soy Moratorium is limited to private rural properties.

# 2

## SCOPE OF WORK

The scope of this work is to identify and map the occurrence of soy crops in the 2016/2017 crop year, in areas of the Amazon Biome that were deforested after July 22, 2008.

The specific objective is to use remote sensing satellite images to map the 2016/2017 soy crop identified in areas deforested after July 22, 2008 (PRODES 2009 to 2016), on private properties outside of settlements but in Amazon Biome municipalities with at least 5,000 hectares (19 square miles) of soy.

# 3

## METHODOLOGY

In the first stage of the work, Amazon Biome municipalities with a soy acreage greater than or equal to 5,000 hectares (19 square miles) were selected, based on Agrosatélite's mapping of the area in the 2016/2017 crop year<sup>5</sup>. Then all the deforested polygons mapped by PRODES (2009 to 2016) in these municipalities were selected. Finally, the soy crops in these deforested areas were identified and mapped through remote sensing satellite images. The detailed methodology follows.

### 3.1 Definition of the study area

In prior years, the study area selected was identified through information available from IBGE. However, the recent mapping of soy acreage in the Amazon Biome<sup>5</sup> shows that six municipalities listed last year as having over 5,000 hectares, in fact have significantly lower acreages (Alto Paraguai-MT, Cáceres-MT, Serra Nova Dourada-MT, Campo Novo do Parecis-MT, Santa Terezinha-MT and Porto Velho-RO), while eight municipalities that were not listed last year have over 5,000 hectares planted with soy crops (Nova Olímpia-MT, Denise-MT, Nova Esperança do Piriá-PA, Ipixuna do Pará-PA, Araguaína-TO, Açailândia-MA, Buriticupu-MA and Itinga do Maranhão-MA).

Of the 89 municipalities selected this year, 59 are in Mato Grosso state, 13 in Pará state, 8 in Rondônia state, 3 in Roraima state, 2 in Amapá state, 3 in Maranhão state and 1 in Tocantins state. These municipalities represent 97% of the soy acreage in the Amazon Biome, with the remaining 3% distributed across another 83 municipalities. The municipality of Tailândia in Pará state has less than 5,000 hectares planted with soy, but it has been included in the list of monitored municipalities because, last year, it had soy crops that were not in compliance with the Soy Moratorium.

The second step in defining the study area consists of selecting the polygons mapped by PRODES<sup>6</sup>, based on the following criteria:

1. They must be wholly or partially within the Amazon Biome (Source: IBGE)<sup>9</sup>;
2. They must be wholly or partially within at least one of the 89 municipalities identified as having over 5,000 hectares of soy crops<sup>5</sup>;
3. They must be located on private rural properties and outside indigenous lands<sup>7</sup>, Conservation Units<sup>8</sup> and settlements<sup>10</sup>; and
4. They must have over 25 hectares (62 acres) after aggregation with adjacent polygons (Item 3.3).

Figure 1 shows the geographical distribution of the 89 selected soy-producing municipalities, as well as Conservation Units, indigenous lands and settlements used to define the range of the study area, as described in the criteria listed above.

- MT 59 municipalities
- PA 13 municipalities
- RO 08 municipalities
- RR 03 municipalities
- AP 02 municipalities
- MA 03 municipalities
- TO 01 municipality

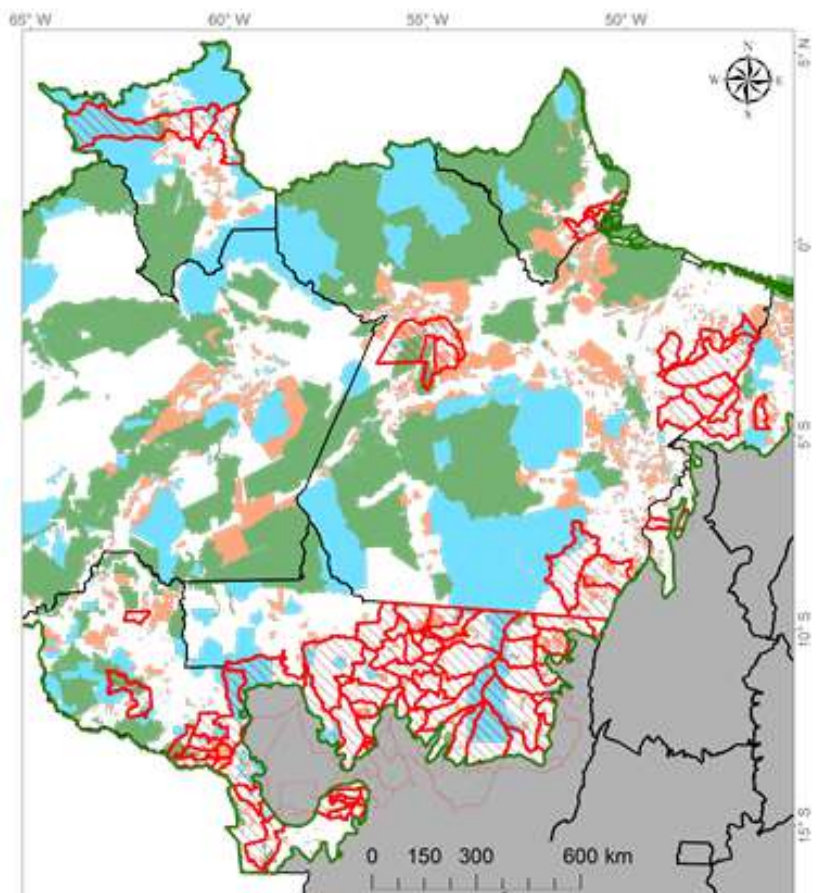
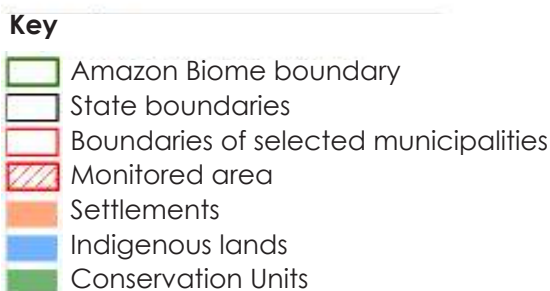


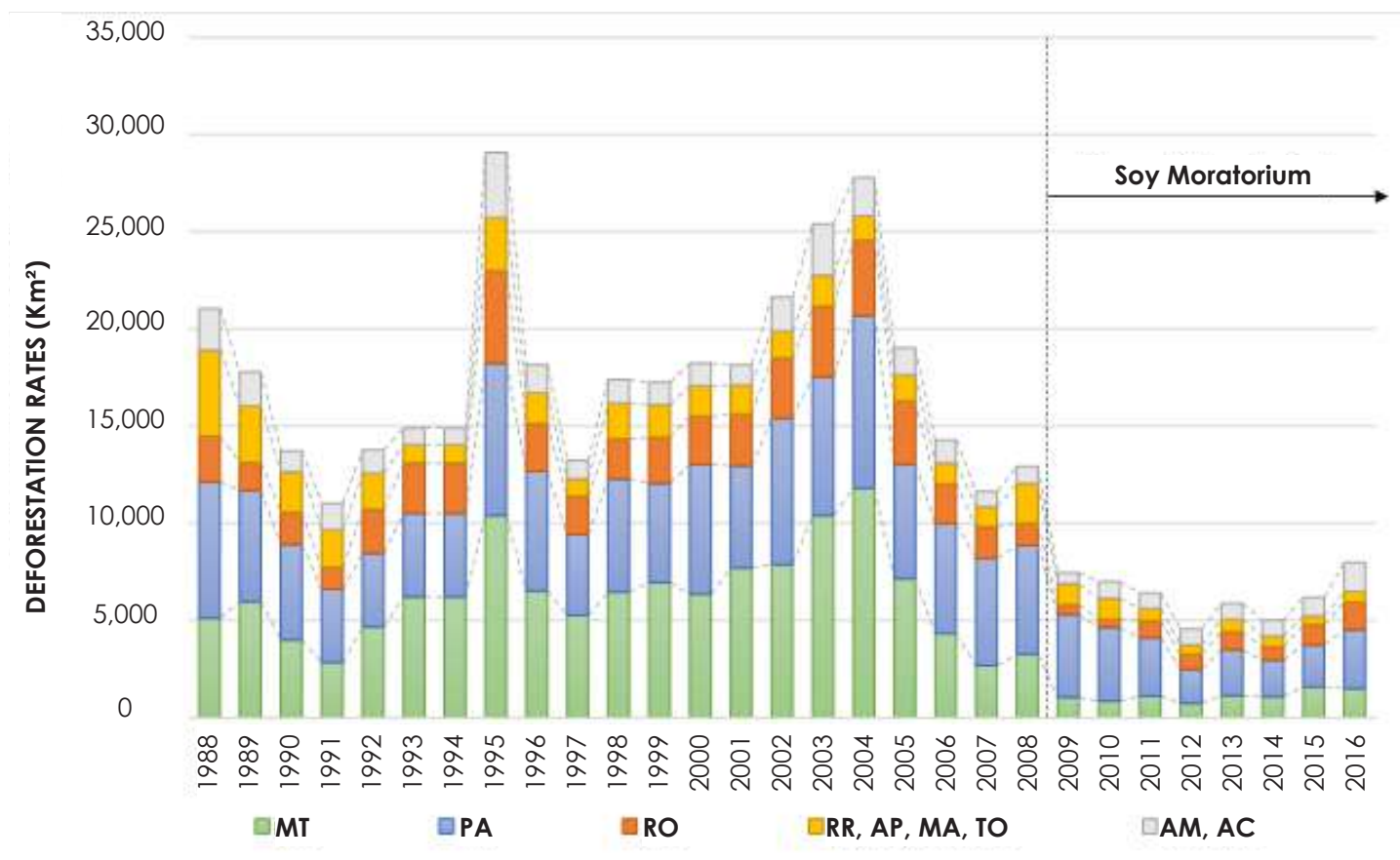
Figure 1. Monitored area of the 89 selected municipalities

It should be noted that, in the case of municipalities only partially located in the Amazon Biome, analysis is restricted to that part that is located within the Biome.

## 3.2 Deforestation mapped by PRODES

Since 1988, the PRODES<sup>6</sup> program developed and executed by INPE has mapped deforested areas and calculated the annual rate of deforestation in Legal Amazon. These data are available on the Internet through a georeferenced database containing the boundaries of deforested areas (polygons) and information on the year each polygon was deforested. For technical reasons, in 2013, INPE created a new georeferenced database, in which the polygons mapped before 2013 were assembled and grouped together in a single mask ([http://www.obt.inpe.br/prodes/NT\\_deslocamentoMascara.pdf](http://www.obt.inpe.br/prodes/NT_deslocamentoMascara.pdf)), thus losing the information on the year of deforestation between 2009 and 2012. As this is a prerequisite for monitoring soy crops on deforested land in the context of the Soy Moratorium, several alternatives for recovering this information in an automated manner were explored, but none of them had a satisfactory result. It was therefore necessary to rely on a procedure strongly based on the visual interpretation by Agrosatelite's analysts, on a computer screen, to delimit, from the large mask of grouped deforestation, those corresponding to PRODES from 2009 to 2012 in the 89 municipalities monitored by the Soy Moratorium. By applying this procedure, the deforestation base for the years 2009 to 2012 is perfectly compatible with the current PRODES database, enabling its use in the process for monitoring soy grown in areas deforested during the Soy Moratorium.

Figure 2 shows Legal Amazon deforestation rates calculated by PRODES, highlighting the period before and after the Soy Moratorium. The significant fall seen in these deforestation rates is due to the government's intervention to curb illegal deforestation in the region through PPCDAm<sup>11</sup>, a prevention plan created in 2004. Deforestation rates fell to a minimum in 2012 and, since then, have shown a tendency to increase gradually, with 2016 being the highest deforestation rate of the last eight years.



Key: MT-Mato Grosso; PA-Pará; RO-Rondônia; RR-Roraima; AP-Amapá; MA-Maranhão; TO-Tocantins; AM-Amazonas; AC-Acre

Source: Adapted from PRODES<sup>6</sup>

Figure 2. Legal Amazon deforestation rates calculated by PRODES, highlighting the years before and after the Soy Moratorium





Table 1 shows the data supplied by PRODES mapping during the Soy Moratorium for the states of Mato Grosso, Pará, Rondônia, Roraima, Amapá, Maranhão and Tocantins. These amounts refer to the deforestation just in the Amazon Biome (not including that part of the Cerrado Biome and the Pantanal Biome that lie within the Legal Amazon region). The average annual rate of deforestation from 2009 to 2016 was 462,913 hectares (4,629 km<sup>2</sup>, or 1,787 square miles).

**Table 1. Total annual area (in hectares) in the Amazon Biome deforested during the Soy Moratorium in the states of Mato Grosso (MT), Pará (PA), Rondônia (RO), Roraima (RR), Amapá (AP), Maranhão (MA) and Tocantins (TO)**

State	A Year of PRODES mapping during the Soy Moratorium <sup>i</sup>								
	2009	2010	2011	2012	2013	2014	2015	2016	Total
<b>MT<sup>iii</sup></b>	77,491	72,039	94,914	71,344	102,080	101,678	131,404	135,259	<b>786,208</b>
<b>PA</b>	366,840	344,400	257,740	174,448	212,350	182,434	216,718	279,065	<b>2,033,993</b>
<b>RO</b>	47,568	45,046	77,672	70,222	97,139	76,878	89,076	117,577	<b>621,177</b>
<b>RR</b>	12,661	24,515	13,258	10,875	15,348	19,063	14,995	23,932	<b>134,647</b>
<b>AP</b>	12,883	7,175	1,667	1,951	2,401	2,890	1,439	765	<b>31,172</b>
<b>MA<sup>iii</sup></b>	26,228	10,889	7,677	7,071	8,819	6,637	8,900	12,057	<b>88,279</b>
<b>TO<sup>iii</sup></b>	1,025	1,385	535	542	1,258	564	571	1,949	<b>7,829</b>
<b>Total<sup>ii</sup></b>	<b>544,696</b>	<b>505,448</b>	<b>453,463</b>	<b>336,453</b>	<b>439,395</b>	<b>390,144</b>	<b>463,104</b>	<b>570,603</b>	<b>3,703,305</b>

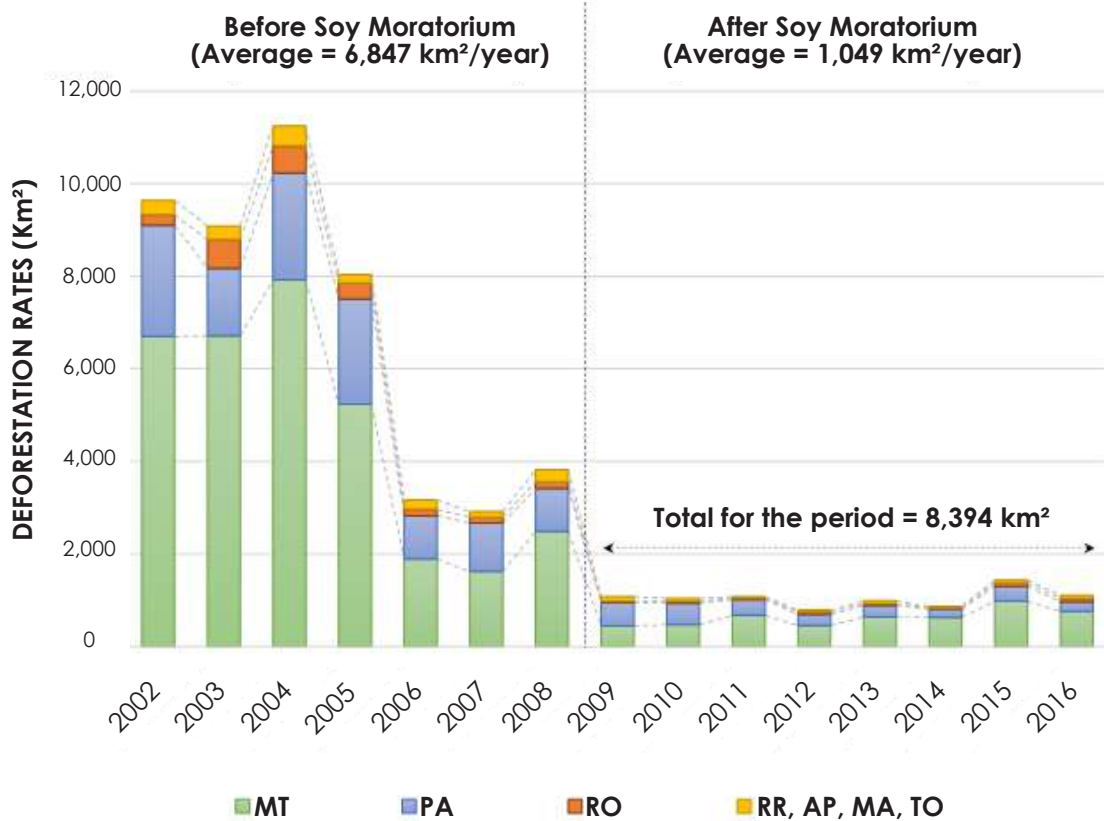
<sup>i</sup> PRODES identifies deforestation occurring from August of one year to July of the following year

<sup>ii</sup> Area calculated based on PRODES maps

<sup>iii</sup> Deforested areas in Mato Grosso, Tocantins and Maranhão that lie within the Amazon Biome

Source: Adapted from PRODES<sup>6</sup>.

Figure 3 shows PRODES deforestation for the period from 2002 to 2016 in the 89 municipalities of the Amazon Biome monitored by the Soy Moratorium in the 2016/2017 crop year. The graph points to a drastic reduction in deforestation after the Soy Moratorium was implemented. The average deforestation rate identified by PRODES in these municipalities fell from 6,847 km<sup>2</sup>/year (2,643 square miles/year) in the period 2002 to 2008 (before the Moratorium) to 1,049 km<sup>2</sup>/year (405 square miles/year) in the period 2009 to 2016 (after the Moratorium). In other words, the average deforestation rate fell to less than one-sixth of what it was before the Soy Moratorium. Furthermore, the share of the monitored municipalities in the total Legal Amazon deforestation fell from 36% in the period from 2002 to 2008, to 17% in the period from 2009 to 2016. In 2016, the deforestation rate in the seven soy-producing states in Legal Amazon increased by 22.2% (the highest rate in the last eight years – Figure 2), while falling 22.4% in the 89 soy-producing municipalities when compared to the rates of the prior year, revealing a tendency for stability in deforestation during the Soy Moratorium (Figure 3). This indicates that the mechanisms for reducing deforestation used after implementing the Moratorium are being more effective in the soy-producing municipalities than in Legal Amazon as a whole.



Key: MT-Mato Grosso; PA-Pará; RO-Rondônia; RR-Roraima; AP-Amapá; MA-Maranhão; TO-Tocantins  
Source: Adapted from PRODES<sup>6</sup>

Figure 3. Deforestation rates calculated by PRODES for the 89 monitored municipalities in the Amazon Biome, highlighting the years before and after the Soy Moratorium

### 3.3 Aggregation of adjacent deforested areas

The GTS determined that deforested areas mapped by PRODES with more than 25 hectares (62 acres) be monitored. A significant part of the deforestation occurs in small areas that, gradually, over the years, increase in size. To enable the incorporation of these adjacent deforested areas with less than 25 hectares, they need to be aggregated each year. They become subject to monitoring when the sum of annual and adjacent areas deforested after the Soy Moratorium was signed exceeds 25 hectares. Figure 4 illustrates the aggregation of three adjacent polygons that were deforested in different years. Before aggregation, the individual polygons had less than 25 hectares but, with aggregation, they total over 25 hectares and, consequently, become subject to monitoring. This aggregation applies to all polygons; even polygons with more than 25 hectares increase in size as new adjacent deforested areas arise.

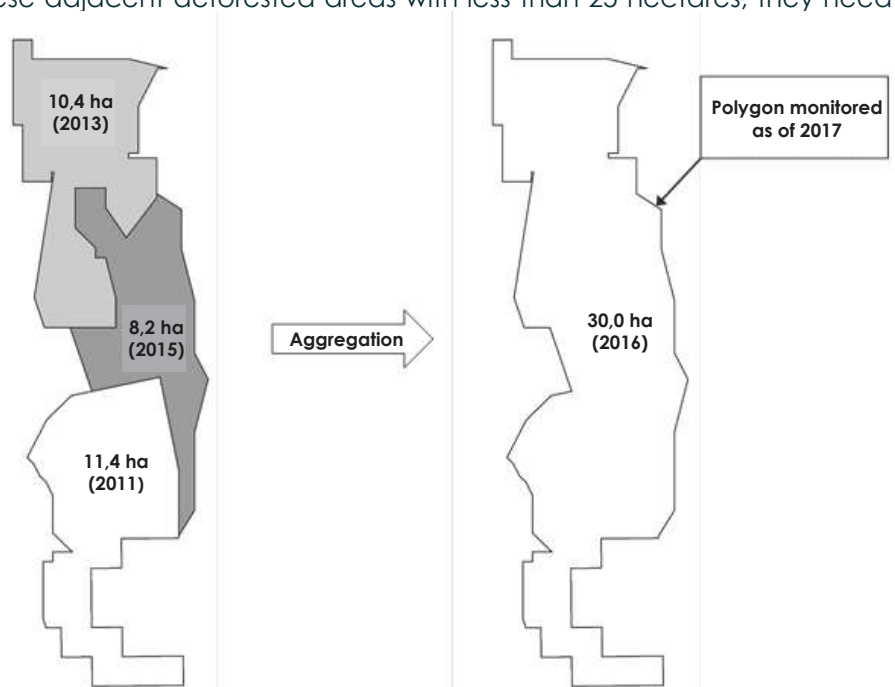


Figure 4. Example of aggregation of three adjacent PRODES polygons mapped between 2009 and 2016, forming a single polygon with over 25 hectares that began to be monitored in the 2016/2017 crop year

### 3.4 Identification of soy in deforested areas

The combined analysis of remote sensing satellite images acquired from sensors with different spatial resolutions ensures the identification of soy crops in the deforested areas monitored by the Soy Moratorium. About 100 images from the MODIS sensor aboard the Terra satellite were used, as well as 522 images from the Landsat-7 and Landsat-8 satellites and 192 images from the Sentinel-2A satellite.

The dates the images were acquired took into consideration the soy calendar followed in the different regions analyzed. To monitor soy crops in the states of Mato Grosso, Rondônia and Tocantins, MODIS-sensor images were selected from the period July 2016 to April 2017. In the states of Maranhão, Pará, Roraima and Amapá, because of the different soy-planting calendar, acquisition of the monitoring images was extended to the end of August 2017.

The method used to detect the presence of soy is based on an index called Crop Enhancement Index (CEI<sup>12</sup>), which accentuates the difference in the values of a vegetation index called Enhanced Vegetation Index (EVI<sup>13</sup>) at two specific moments in the soy calendar: a) in the off-season, before the soy growing season starts, when EVI values for soy are relatively lower than those for regenerating forest or pastures (MinEVI – Figure 5); and b) when the soy is well developed and shows EVI values that are higher than those for regenerating forest, Cerrado or pastures (MaxEVI – Figure 5).

High CEI values indicate the presence of soy or, possibly, another annual crop with characteristics similar to soy. Regenerating forest and pastures show low CEI values as their seasonal variation has a smaller EVI range when compared to soy (Figure 5). In this way, the CEI makes it possible to differentiate soy acreage from other land uses, such as forest regeneration or pastures.

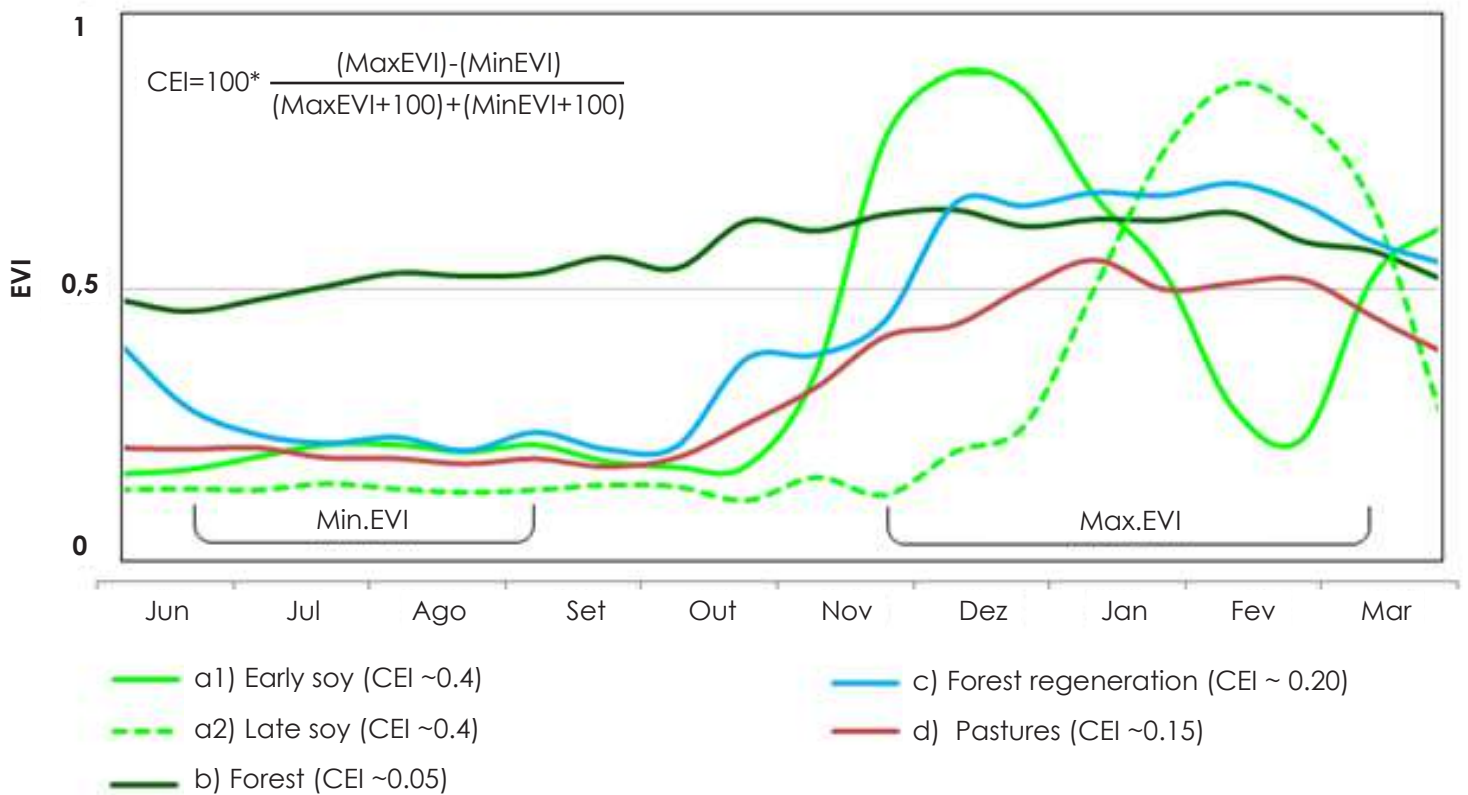


Figure 5. Example of the temporal variation in EVI values for: a1) early soy; a2) late soy, according to the Mato Grosso state agricultural calendar; b) forest; c) forest regeneration; and d) pastures. Also shown are the periods of minimum values (MinEVI) and maximum values (MaxEVI) to calculate CEI



Figure 6 illustrates the sequence of analysis and identification of soy crops in satellite images. Figure 6a shows a CEI image highlighting soy acreage in dark blue, differentiating these areas from other points in the image that do not have annual crop characteristics. Figure 6c is a detail of this CEI image, showing two deforested polygons: one with a low CEI value (pale green) without an annual crop and the second, a dark blue, with an annual crop. Confirmation that the annual crop was soy was obtained, in this case, through an OLI/Landsat-8 image acquired on January 17, 2017, in which 720 hectares (1,779 acres) of soy were identified and mapped in this deforested polygon, as shown in Figure 6d.

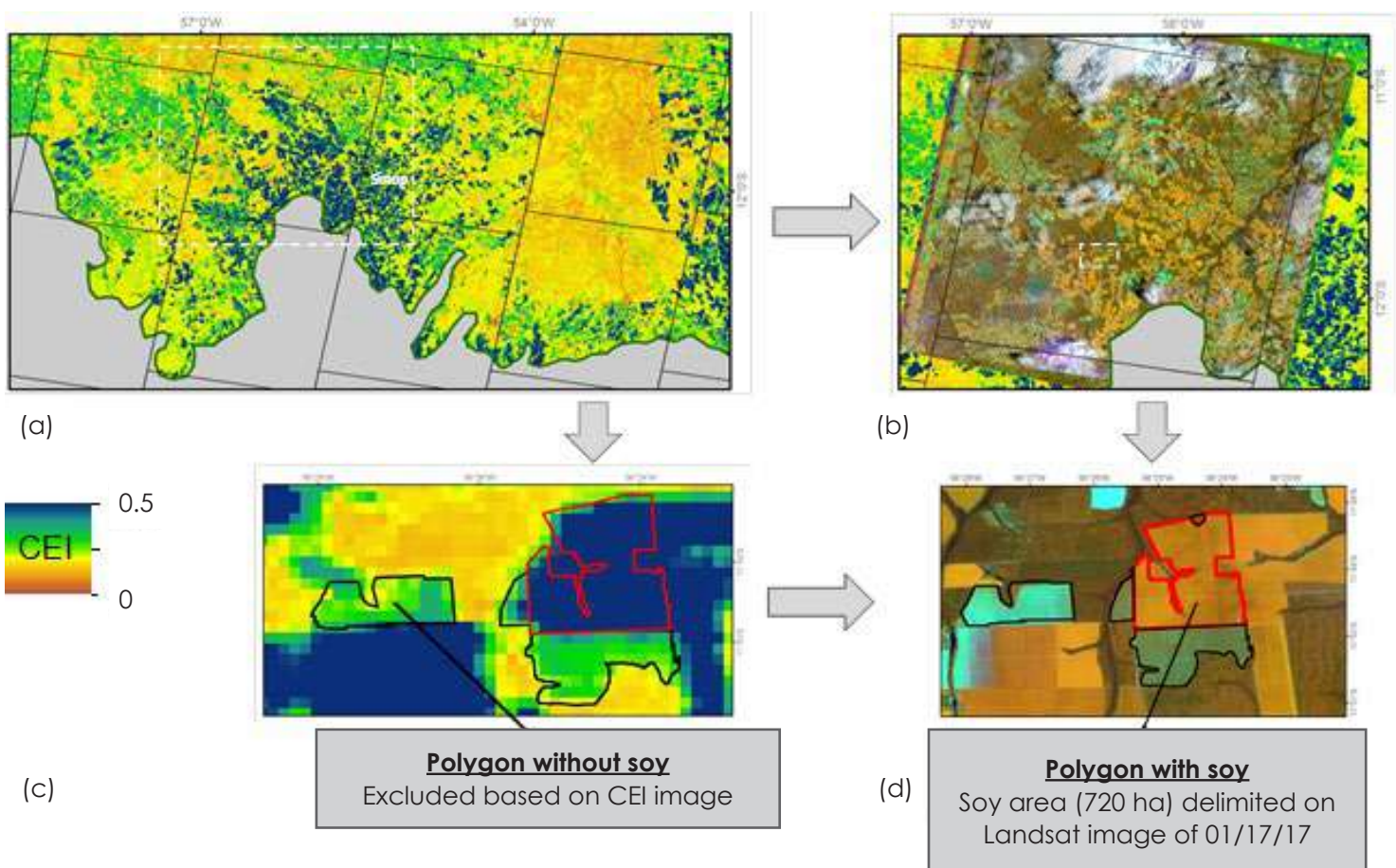


Figure 6. Sequence of the identification and mapping of soy crops from satellite images of deforested polygons: a) CEI image obtained from EVI/MODIS images; b) OLI/Landsat-8 image taken on January 17, 2017; c) detail of the CEI image identifying areas without soy; d) detail of the OLI/Landsat-8 image to delimit the soy crop in the deforested polygon and evaluate the planted area

## 4.1 Selection of deforested areas mapped by PRODES

In the 89 municipalities monitored under the Soy Moratorium, PRODES, from 2009 to 2016, mapped a deforested area of 839,381 hectares (3,241 square miles) (Table 2, aggregated polygons). Table 2 shows that the class with areas less than or equal to 25 hectares (62 acres) represents 367,586 hectares (1,419 square miles) before the aggregation of adjacent polygons, or 43% of the total deforested area. After aggregation (using the methodology described in Item 3.3), this class was reduced to 209,653 hectares (809 square miles), indicating that a significant part (157,933 hectares, or 610 square miles) was removed from the class with areas less than or equal to 25 hectares as they became aggregated into larger classes and, therefore, subject to monitoring. The smaller class with an area less than or equal to 25 hectares now represents just 25% of the total.

**Table 2. Number of polygons (n) and area (hectares), with and without aggregation of deforested polygons between 2009 and 2016 in the 89 monitored municipalities**

Classes	PRODES - Disaggregated		PRODES - Aggregated	
	n	ha	n	ha
≤ 25 ha	35,585	367,586	19,611	209,653
25 to 50 ha	3,712	125,911	3,261	113,108
50 to 100 ha	1,425	97,087	1,627	112,787
≥100 ha	988	248,804	1,334	403,833
<b>Total</b>	<b>41,710</b>	<b>839,389*</b>	<b>25,833</b>	<b>839,381*</b>
<b>Total &gt; 25 ha</b>	<b>6,125</b>	<b>471,802</b>	<b>6,222</b>	<b>629,728</b>

\*Aggregation of polygons results in a residual variation in area compared to disaggregated polygons that, for this crop year, was just seven hectares (17 acres).

Considering the PRODES aggregated polygons with an area over 25 hectares (Table 2), the 59 soy-producing municipalities in Mato Grosso state that are located in the Amazon Biome had a deforested area of 415,599 hectares (1,605 square miles), equivalent to 66.0% of the deforested area in the 89 municipalities monitored by the Soy Moratorium. In the 13 municipalities in Pará state, the deforested area was 163,205 hectares (630 square miles), or 25.9% of the total deforestation, while the eight municipalities in Rondônia state had a deforested area of 22,455 hectares (87 square miles), or 3.6% of the total deforestation. In the three municipalities in Roraima state and in the two municipalities in Amapá state, the deforested area was, respectively, 6,454 hectares, or 25 square miles (1.0% of total deforestation) and 844 hectares, or 3 square miles (0.1% of total deforestation). The three municipalities in Maranhão state and the one municipality in Tocantins state had, respectively, a deforested area of 19,521 hectares, or 75 square miles (3.1% of total deforestation) and 1,649 hectares, or 6 square miles (0.3% of total deforestation), as shown in Table 3.

**Table 3. Areas (in hectares) deforested during the Soy Moratorium in the 89 municipalities in the states of Mato Grosso (MT), Pará (PA), Rondônia (RO), Roraima (RR), Amapá (AP), Maranhão (MA) and Tocantins (TO)**

Classes	MT	PA	RO	RR	AP	MA	TO	Total
<b>25 to 50</b>	55,863	42,615	5,957	2,463	559	5,382	268	113,108
<b>50 to 100</b>	60,720	38,296	5,673	1,488	147	6,178	285	112,787
<b>&gt;100</b>	299,016	82,294	10,826	2,503	137	7,960	1,096	403,833
<b>Total</b>	<b>415,599</b>	<b>163,205</b>	<b>22,455</b>	<b>6,454</b>	<b>844</b>	<b>19,521</b>	<b>1,649</b>	<b>629,728</b>

According to the criteria established by the GTS, the monitoring of soy crops is restricted to deforestation on private rural properties (Item 3.1) and to deforestation partially located in Conservation Units, indigenous lands and settlements, a total of 516,552 hectares, or 1,994 square miles (Table 4), corresponding to 82% of the total deforested area in polygons with over 25 hectares (62 acres).

**Table 4. Distribution of areas (in hectares) deforested after the Soy Moratorium, on private properties, Conservation Units (UC), indigenous lands (TI) and settlements, by state**

Deforestation	MT	PA	RO	RR	AP	MA	TO	Total
a. Outside UC, TI and Settlements	315,170	105,579	18,899	2,119	714	11,275	1,469	455,225
b. Partially in UC, TI and Settlements	34,578	20,415	1,696	1,503	0	3,134	0	61,327
c. Wholly within UC, TI and Settlements	65,851	37,211	1,860	2,832	130	5,112	181	113,176
<b>Total</b>	<b>415,599</b>	<b>163,205</b>	<b>22,455</b>	<b>6,454</b>	<b>844</b>	<b>19,521</b>	<b>1,650</b>	<b>629,728</b>
<b>Total monitored (a+b)</b>	<b>349,748</b>	<b>125,994</b>	<b>20,595</b>	<b>3,622</b>	<b>714</b>	<b>14,409</b>	<b>1,469</b>	<b>516,552</b>

## 4.2 Identification of deforested polygons with soy through satellite images

The 516,552 deforested hectares (Table 4) that meet the criteria established by the GTS (Item 3.1) were monitored using CEI/MODIS images (Item 3.4, Figure 6) and 522 Landsat-7 and Landsat-8 satellite images, as well as 192 Sentinel-2A satellite images that were available for this monitoring. Each polygon was inspected individually, using visual interpretation techniques to identify and map the soy crops growing in these polygons.

All told, soy was identified in 469 polygons that underwent a review to verify whether they were in fact deforested during the Soy Moratorium. This review of the deforestation date indicated by PRODES is necessary because PRODES images are not selected with the Soy Moratorium in mind; they are chosen to identify deforestation in each year. The review of the date is based on Landsat images obtained from the year 2000 up to the period closest to the Soy Moratorium's reference date (July 22, 2008), aided by images from the MODIS sensor over the same period. Deforested areas identified as growing soy in polygons partially located in Conservation Units, indigenous lands and settlements were also submitted to a review to eliminate those polygons where the soy acreage was entirely within the boundaries of these special areas. After both these reviews, 59 polygons (44 in Mato Grosso, 11 in Pará, 2 in Roraima and 2 in Maranhão) were found to have a total of 602 hectares (1,488 acres) of soy that complied with the Soy Moratorium. After the entire process for identifying soy in deforested polygons mapped during the Soy Moratorium, INPE made a careful and independent audit of the results, attesting to the quality of the work performed by Agrosatélite.

In this way, in the 2016/2017 crop year, 47,365 hectares (183 square miles) of soy on 410 polygons were identified as not complying with the Soy Moratorium. Mato Grosso state had 36,134 hectares (140 square miles) that did not comply with the Moratorium's criteria (Table 5), corresponding to 76.3% of the soy detected during the monitoring process and to 4.6% of the total area in the Amazon Biome portion of this state deforested during the Moratorium (786,208 hectares, or 3,036 square miles – Table 1). In Pará state, 7,481 hectares (29 square miles – Table 5) were identified with soy that was not in compliance with the Soy Moratorium, representing 15.7% of the soy detected in the monitoring process, but only 0.4% of the area in this state deforested during the Moratorium (2,033,993 hectares, or 7,853 square miles – Table 1). Rondônia state had 1,602 hectares (6 square miles) of soy (Table 5), corresponding to 3.4% of the soy detected during the monitoring process and 0.3% of the total area in this state deforested during the Moratorium (621,177 hectares, or 2,398 square miles – Table 1). In Maranhão state, 2,212 hectares (9 square miles) of soy were identified (Table 5), which corresponds to 4.7% of the soy detected in the monitoring process and to 2.5% of the total area in this state deforested during the Moratorium (88,279 hectares, or 341 square miles – Table 1). No soy in the states of Roraima, Amapá and Tocantins was identified as not complying with the Soy Moratorium. However, especially in the states of Amapá and Roraima, soy expansion occurred through conversion of non-forest native vegetation that was not mapped by PRODES nor monitored in the context of the Moratorium.

It should be noted that soy acreage in deforested polygons with over 100 hectares (247 acres) was 39,161 hectares (151 square miles), equivalent to 83% of the total that does not comply with the Soy Moratorium (Table 5). This indicates that the majority of the soy acreage not in compliance is found on private properties that cleared larger areas of forest land, while the class of deforested polygons with between 25 hectares (62 acres) and 50 hectares (124 acres) of soy had only 3,516 hectares (14 square miles), or 7.4%, that were not in compliance with the Moratorium. It can therefore be inferred that the 209,653 hectares (809 square miles), or 25%, of deforested polygons with less than 25 hectares (Table 2) – and consequently not monitored – make a relatively small contribution to the soy acreage that does not comply with the Soy Moratorium.

Item 8, the Appendix, contains the complete list of the 410 deforested polygons with soy acreage that were monitored in the 2016/2017 crop year.

**Table 5. Soy acreage (in hectares) not in compliance with the Soy Moratorium, by size of deforested polygon, in the states of Mato Grosso (MT), Pará (PA), Rondônia (RO), Roraima (RR), Amapá (AP), Maranhão (MA) and Tocantins (TO)**

Classes	MT	PA	RO	RR	AP	TO	MA	Total
25 to 50	2,053	1,056	178	0	0	0	228	3,516
50 to 100	2,620	1,196	168	0	0	0	703	4,688
>100	<b>31,460</b> <b>(87%)</b>	<b>5,165</b> <b>(70%)</b>	<b>1,255</b> <b>(78%)</b>	<b>0</b> <b>0</b>	<b>0</b> <b>0</b>	<b>0</b> <b>0</b>	<b>1,281</b> <b>(58%)</b>	<b>39,161</b> <b>(83%)</b>
<b>Total</b>	<b>36,134</b>	<b>7,418</b>	<b>1,602</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,212</b>	<b>47,365</b>

Figure 7 shows the 89 monitored municipalities, classified by the size of their soy acreage not in compliance with the Soy Moratorium. Of the total, 55 municipalities have soy acreage that does not comply with the Moratorium (Table 6), while 34 municipalities are fully compliant with the Moratorium. Among the non-compliant municipalities, 16 have between 1,000 hectares (4 square miles) and 6,200 hectares (24 square miles), with a total of 38,824 hectares (150 square miles), representing 82% of the total soy acreage that is not in compliance with the Moratorium (Figure 7, Table 6).

The remaining 39 municipalities that are not in compliance with the Soy Moratorium have soy acreages of less than 1,000 hectares and represent 18% (8,541 hectares, or 33 square miles) of the total (Figure 7, Table 6). Seven municipalities in Mato Grosso state (Feliz Natal, Santa Carmem, Nova Maringá, Nova Ubiratã, União do Sul, Porto dos Gaúchos and Itanhanga) and two municipalities in Pará state (Paragominas e Dom Eliseu) stand out as they concentrate 62% of the soy acreage not in compliance with the Soy Moratorium. In the 2016/2017 crop year, Feliz Natal-MT had the largest soy acreage not in compliance with the Moratorium (6,200 hectares), and deforested 31,720 hectares (122 square miles) between 2009 and 2016. Paragominas-PA was the municipality that most deforested land between 2009 and 2016 (35,141 hectares, or 136 square miles).

- 3 municipalities with soy acreage > 3,000 hectares (Feliz Natal, Santa Carmen and Nova Maringá in MT)
- 6 municipalities with soy acreage > 2,000 hectares (Nova Ubiratã, União do Sul, Porto do Gaúchos and Itanhangá in MT; Paragominas and Dom Eliseu in PA)

- 3 municipalities >3,000 ha
- 6 municipalities 2,001 - 3,000 ha
- 7 municipalities 1,001 - 2,000 ha
- 6 municipalities 501 - 1,000 ha
- 33 municipalities 1 - 500 ha
- 34 municipalities Zero ha

- Amazon Biome boundaries
- State boundaries

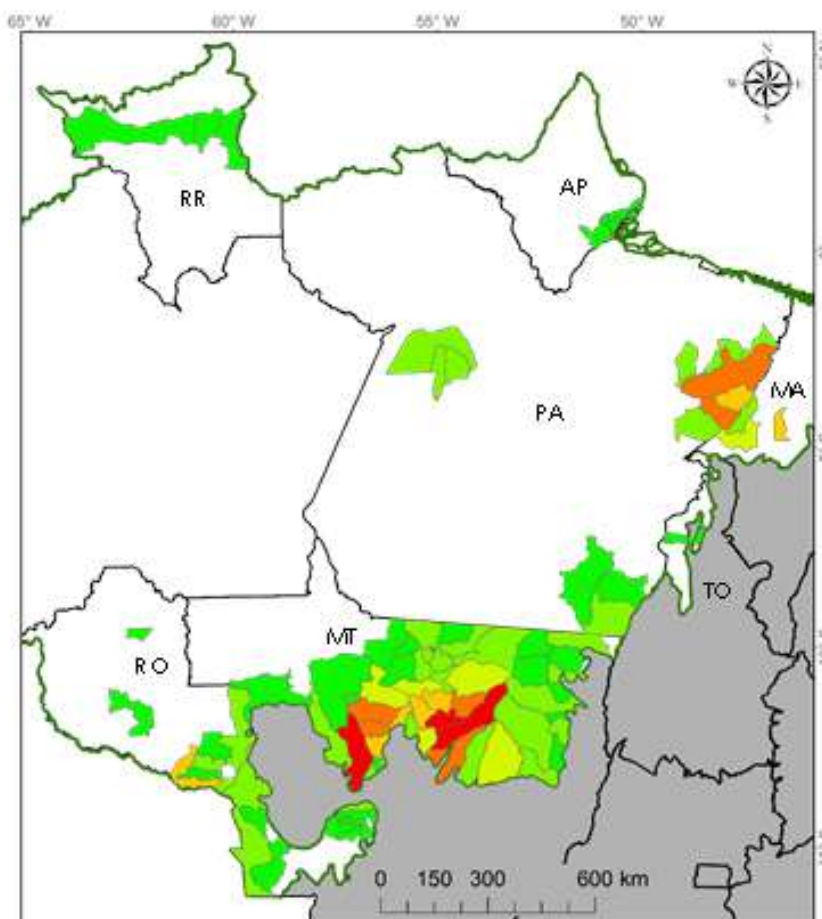


Figure 7. Spatial distribution of the 89 municipalities monitored, classified in accordance with soy acreage not in compliance with the Soy Moratorium in the 2016/2017 crop year

From 2009 to 2016, 839,381 hectares (3,241 square miles) in the 89 monitored municipalities were deforested (Table 2). Of this total, 47,365 hectares (183 square miles) were converted to soy crops. In other words, soy was directly responsible for 5.6% of the deforestation that occurred in these municipalities, in the area monitored by the Soy Moratorium. On the other hand, 94.4% of the deforestation occurring in soy-producing municipalities is not associated with soy production, considering the area monitored by the Moratorium.

Table 6. List of 55 municipalities with soy in noncompliance with the Soy Moratorium in 2016/2017

Municipality	State	Polygons with soy (n)	Soy acreage in 2016/2017 (ha)	Area deforested from 2009 to 2016 (ha)	% of soy related to deforestation
Feliz Natal	MT	29	6,200	31,720	19.5%
Santa Carmem	MT	21	4,424	9,330	47.4%
Nova Maringá	MT	23	3,209	16,778	19.1%
Nova Ubiratã	MT	18	2,765	17,829	15.5%
União do Sul	MT	12	2,537	13,650	18.6%
Porto dos Gaúchos	MT	12	2,528	13,335	19.0%
Itanhangá	MT	16	2,235	20,328	11.0%
Cláudia	MT	15	1,958	12,665	15.5%
Ipiranga do Norte	MT	5	1,589	6,190	25.7%
Tapurah	MT	13	1,520	7,116	21.4%
Sinop	MT	6	1,232	6,315	19.5%



Municipality	State	Polygons with soy (n)	Soy acreage in 2016/2017 (ha)	Area deforested from 2009 to 2016 (ha)	% of soy related to deforestation
Tabaporã	MT	4	794	11,656	6.8%
Marcelândia	MT	17	647	22,013	2.9%
Vera	MT	5	588	3,061	19.2%
Gaúcha do Norte	MT	9	581	16,078	3.6%
Itaúba	MT	5	548	12,701	4.3%
Matupá	MT	6	498	14,128	3.5%
São Félix do Araguaia	MT	4	476	10,989	4.3%
Terra Nova do Norte	MT	5	314	4,710	6.7%
Nova Santa Helena	MT	5	291	2,744	10.6%
Canarana	MT	1	219	2,178	10.0%
Sorriso	MT	1	175	322	54.3%
Lucas do Rio Verde	MT	3	165	1,101	15.0%
Diamantino	MT	2	110	242	45.3%
Comodoro	MT	5	98	13,317	0.7%
Querência	MT	3	84	15,628	0.5%
São José do Rio Claro	MT	2	68	2,657	2.5%
Vila Rica	MT	3	46	7,053	0.7%
Vila Bela da Santíssima Trindade	MT	2	46	13,232	0.3%
Porto Alegre do Norte	MT	2	44	1,848	2.4%
Colíder	MT	1	41	2,849	1.4%
Paranatinga	MT	1	34	8,498	0.4%
Peixoto de Azevedo	MT	2	34	29,204	0.1%
Novo Mundo	MT	2	14	12,533	0.1%
Nova Guarita	MT	1	13	1,113	1.2%
Brasnorte	MT	1	6	12,905	0.0%
Bom Jesus do Araguaia	MT	1	5	4,303	0.1%
<b>Total for Mato Grosso state</b>		<b>263</b>	<b>36,134</b>	<b>382,319</b>	<b>9.5%</b>

Municipality	State	Polygons with soy (n)	Soy acreage in 2016/2017 (ha)	Area deforested from 2009 to 2016 (ha)	% of soy related to deforestation
Paragominas	PA	29	2,991	35,141	8.5%
Dom Eliseu	PA	33	2,292	16,844	13.6%
Ulianópolis	PA	14	1,281	17,575	7.3%
Rondon do Pará	PA	7	286	23,067	1.2%
Belterra	PA	4	173	3,624	4.8%
Ipixuna do Pará	PA	3	143	16,289	0.9%
Santarém	PA	3	92	11,448	0.8%
Nova Esperança do Piriá	PA	2	54	14,372	0.4%
Mojú dos Campos	PA	3	52	13,330	0.4%
Tailândia	PA	1	32	16,420	0.2%
Santana do Araguaia	PA	1	21	24,197	0.1%
<b>Total for Pará state</b>		<b>100</b>	<b>7,418</b>	<b>192,307</b>	<b>3.9%</b>

Municipality	State	Polygons with soy (n)	Soy acreage in 2016/2017 (ha)	Area deforested from 2009 to 2016 (ha)	% of soy related to deforestation
Pimenteiras do Oeste	RO	3	1,009	4,256	23.7%
Vilhena	RO	5	231	8,526	2.7%
Corumbiara	RO	2	114	1,808	6.3%
Cabixi	RO	5	248	2,711	9.1%
<b>Total for Rondônia state</b>		<b>15</b>	<b>1,602</b>	<b>17,301</b>	<b>9.3%</b>

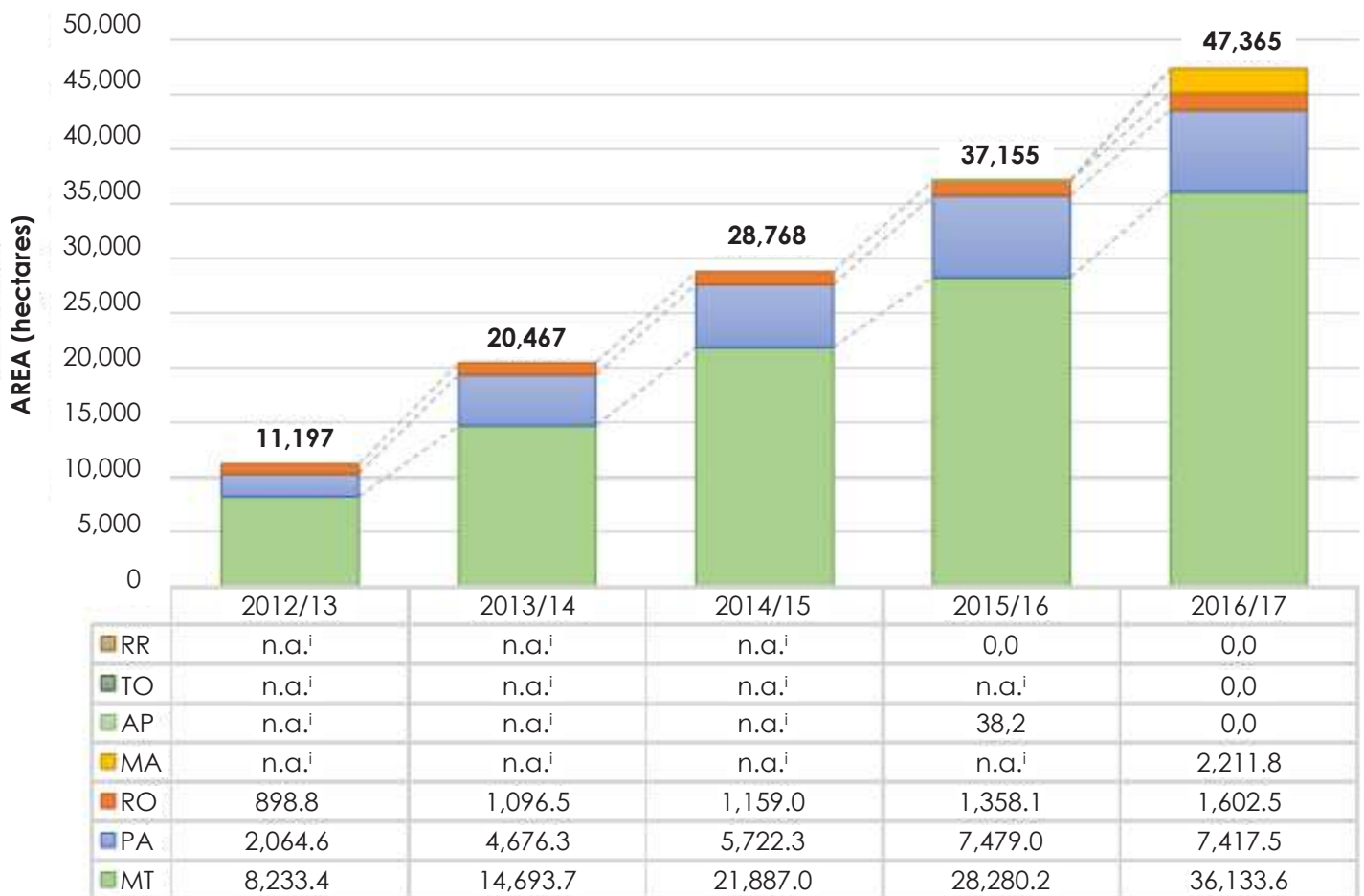
Municipality	State	Polygons with soy (n)	Soy acreage in 2016/2017 (ha)	Area deforested from 2009 to 2016 (ha)	% of soy related to deforestation
Açailândia	MA	14	826	8,816	9.4%
Buriticupu	MA	10	1,074	8,513	12.6%
Itinga do Maranhão	MA	8	312	11,042	2.8%
<b>Total for Maranhão state</b>		<b>32</b>	<b>2,212</b>	<b>28,370</b>	<b>7.8%</b>

<b>Total for MT, PA, RO and MA</b>		<b>410</b>	<b>47,365</b>	<b>620,298</b>	<b>7.6%</b>
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The 34 municipalities in the following list are in full compliance with the Soy Moratorium for the 2016/2017 crop year. In Mato Grosso state: Novo Horizonte do Norte, Pontes e Lacerda, Ribeirão Cascalheira, Santa Cruz do Xingu, Alta Floresta, Nova Lacerda, Nova Marilândia, Nova Mutum, Tangará da Serra, Canabrava do Norte, Carlinda, Confresa, Denise, Guarantã do Norte, Juara, Juína, Nortelândia, Nova Olímpia, São José do Xingu, Nova Canaã do Norte, Santo Afonso and Alto Boa Vista. In Pará state: Santa Maria das Barreiras and Cumaru do Norte. In Rondônia state: Rio Crespo, São Miguel do Guaporé, Cerejeiras and Chupinguaia. In Roraima state: Alto Alegre, Boa Vista and Bonfim. In Amapá state: Itauba and Macapá. In Tocantins state: Araguaína.

## 4.3 Expansion of soy not in compliance during the last five crops

Based on the new Soy Moratorium reference date that considers soy crops on land deforested after July 22, 2008, the average annual rate of soy expansion not complying with the Moratorium is 9,473 hectares/year (37 square miles/year). This number has been roughly constant over the last five years, as shown in Figure 8.



<sup>i</sup> n.a. corresponds to not evaluated.

Figure 8. Evolution of soy acreage not in compliance with the Soy Moratorium in the States of Mato Grosso (MT), Pará (PA), Rondônia (RO), Roraima (RR), Amapá (AP), Maranhão (MA) and Tocantins (TO) for the crop years from 2012/2013 to 2016/2017

The gradual increase in soy acreage not in compliance with the Soy Moratorium over the last five crop years is mainly due to the greater time lapse since July 22, 2008 because, to convert forest land to agriculture, time is needed to complete removal of trunks and roots, as well as to correct the soil. This process for converting to soy can take a few years, and it is common for rice to be grown on recently deforested land for a year or two before soy is planted.

Figure 9 shows the soy acreage not in compliance with the Soy Moratorium for the 2016/2017 crop year, by year of deforestation mapped by PRODES. As can be seen, 65% of the area planted with soy (30,547 hectares, or 118 square miles) occurred in areas that were deforested in the first four years of the Moratorium (2009 to 2012), whereas soy acreage in more recently deforested areas (2013 to 2016) was just 35% (16,818 hectares, or 65 square miles). Nevertheless, it was in these more recent areas of deforestation that a large part of the new soy acreage not in compliance with the Moratorium was found.

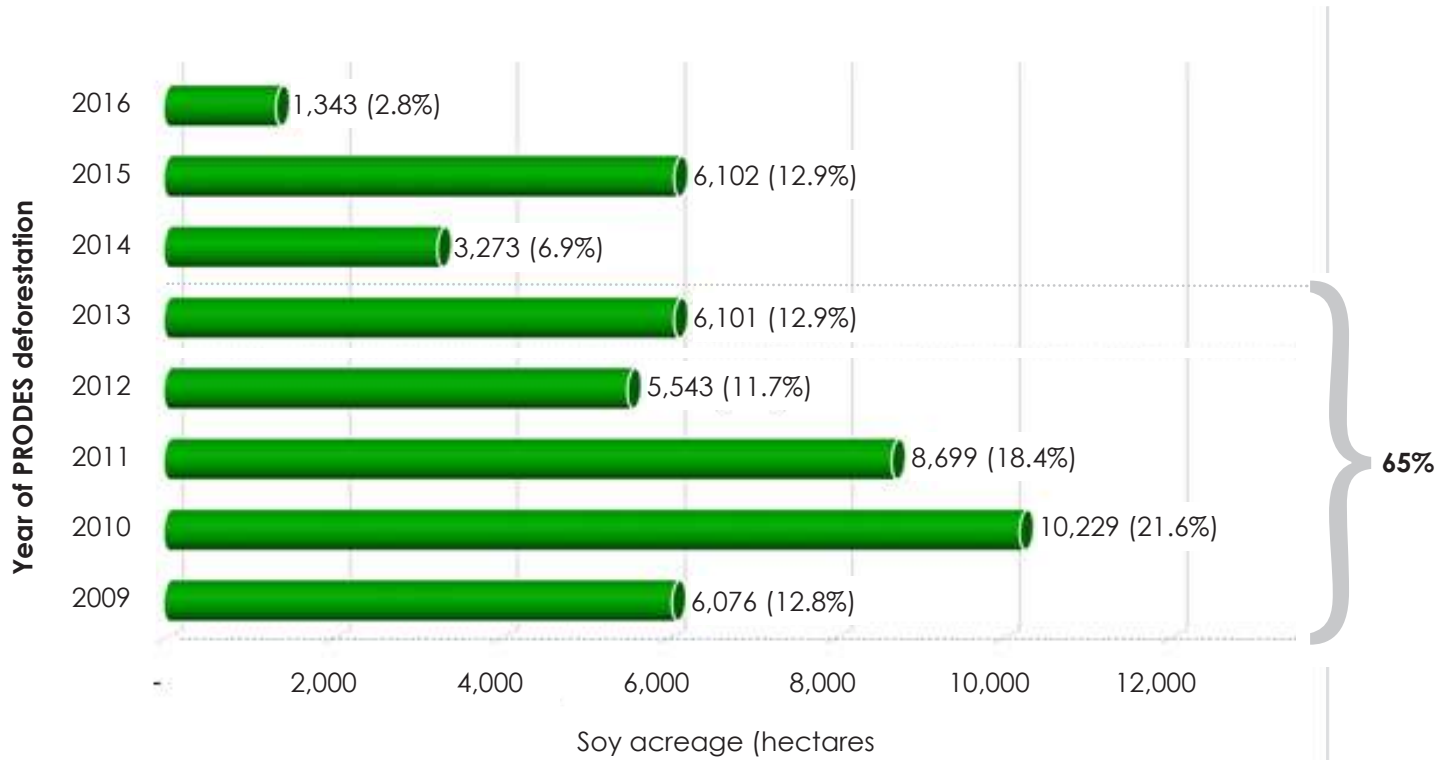


Figure 9. Soy acreage by year of deforestation

## 4.4 Relevance of soy acreage in recent deforestation in the Amazon Biome

The 2016/2017 Brazilian soy crop was 114.1 million tons, grown on an area of 33.9 million hectares<sup>4</sup> (130,889 square miles). There was a small 2.0% increase in planted area and a significant 19.5% increase in productivity, mainly due to the favorable climatic conditions in most of Brazil's territory.

In the Amazon Biome, in the 2016/2017 crop year, 4.48 million hectares (17,297 square miles) were planted, which represents 13% of Brazil's total soy acreage. This means that the 47,365 hectares (183 square miles) of soy planted in areas of the Amazon Biome deforested during the Soy Moratorium represent just 1% of the current soy acreage in this Biome. Since the start of the Soy Moratorium in the 2006/2007 crop year, soy acreage in the Amazon Biome has more than tripled, going from 1.14 million hectares (4,402 square miles) to the current 4.48 million hectares, considerable growth in a period of sharp decline in annual deforestation rates (Figure 10). This growth is essentially due to soy expansion into pastures that were deforested prior to the Soy Moratorium<sup>14</sup>, showing the effectiveness of this initiative in mitigating soy expansion into newly deforested areas but not impeding the expansion of this economic activity in the Amazon Biome, as illustrated in Figure 10.

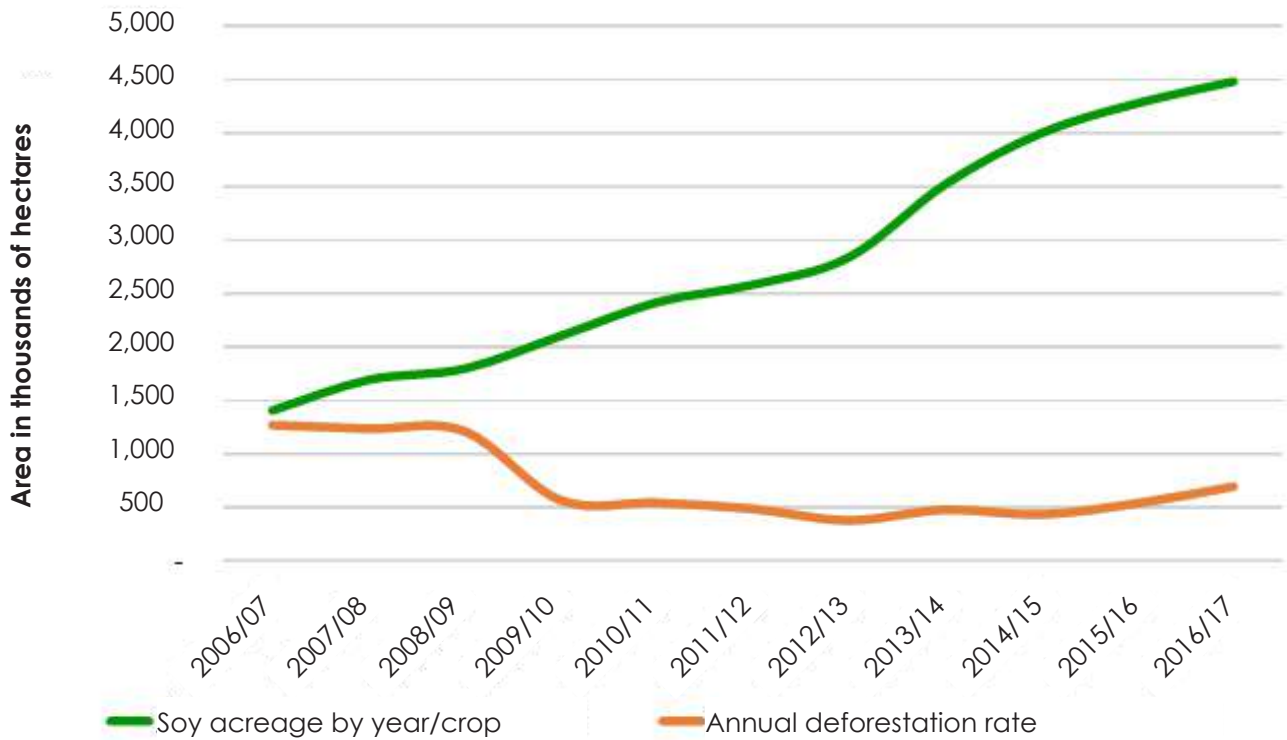


Figure 10. Evolution of soy acreage versus annual deforestation rate over the last ten crop years in the Amazon Biome

Sources: Adapted from Agrosatélite<sup>5</sup> and PRODES<sup>6</sup>

Figure 11 shows a comparison of the deforested area in the Amazon Biome and in the 89 monitored municipalities (Table 2), as well as soy acreage on areas deforested during the Soy Moratorium (Table 5). The monitored municipalities were responsible for 20.4% of the deforestation in the Amazon Biome, but only 5.6% of this area was used for soy production in the 2016/2017 crop year.

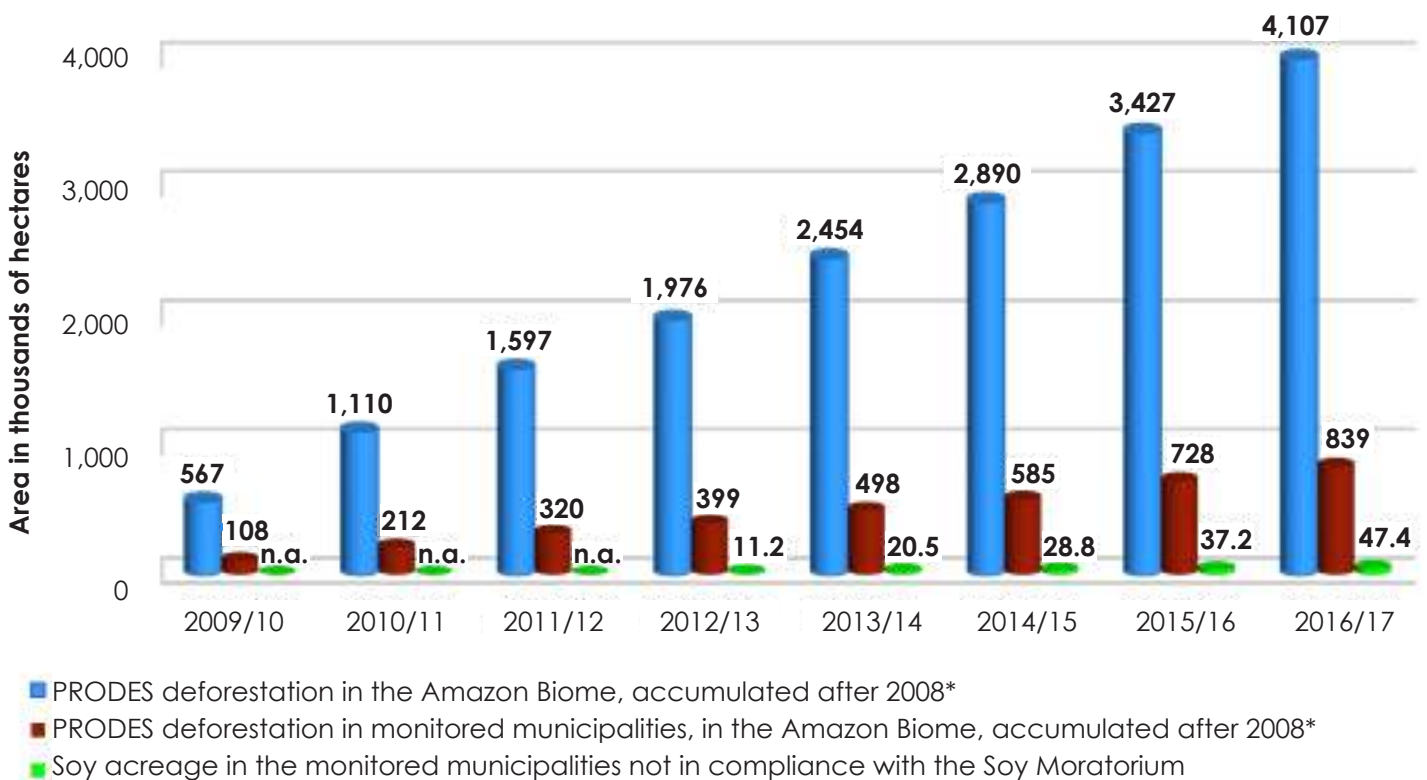


Figure 11. Evolution of accumulated deforestation (Amazon Biome and 89 municipalities) and of soy in the monitored municipalities that was not in compliance with the Soy Moratorium in the 2016/2017 crop year

\* Area calculated based on maps made available by PRODES<sup>6</sup>

Based on satellite images, 47,365 hectares (183 square miles) of soy in the 2016/2017 crop year were identified in areas of the Amazon Biome deforested since July 22, 2008, representing an increase of 27.5% over the prior year (37,155 hectares, or 144 square miles). Mato Grosso state had most of the soy crops in areas that did not comply with the Soy Moratorium – 36,134 hectares (140 square miles), or 76.2%, followed by Pará state with 7,481 hectares (29 square miles), or 15.7%, then Maranhão state with 2,212 hectares (9 square miles), or 4.7% and Rondônia state with 1,602 hectares (6 square miles), or 3.4%.

Over the last eight years, deforestation in the Amazon Biome was 4.11 million hectares (15,869 square miles). The 89 monitored municipalities responsible for 97% of the Biome's soy acreage in the 2016/2017 crop year had a deforested area of 839,381 hectares (3,241 square miles), or 20% of the total. The average rate of deforestation in these municipalities after the Soy Moratorium (2009-2016) is 6.5 times lower than in the prior period (2002-2008), showing the effectiveness of the various mechanisms for reducing deforestation in the Amazon Biome that have been in effect over the last several years. This survey reveals that soy acreage answers for 1.2% of the deforestation in the Biome as a whole. Nevertheless, if we look only at that part of the Biome where 97% of the soy is grown (89 municipalities), we can see that, even then, soy acreage accounts for just 5.6% of the deforested area, indicating that 94.6% of the deforestation that occurred during the Soy Moratorium was associated with other land uses, considering only the area monitored by the Moratorium.

Finally, it is important to highlight that, since the beginning of the Soy Moratorium, soy acreage in the Amazon Biome has more than tripled, going from 1.14 million hectares (4,402 square miles) in the 2006/2007 crop year to 4.48 million hectares (17,297 square miles) in the 2016/2017 crop year, corresponding to 13% of Brazil's soy acreage. In this connection, the 47,365 hectares (183 square miles) of soy in areas deforested during the Soy Moratorium represent just 1% of the Amazon Biome's current soy acreage. Soy has expanded essentially in pastures that were deforested prior to the Moratorium, showing this initiative's effectiveness in allowing the development of food production without stimulating the conversion of the forest into agricultural lands.

São Paulo, November 28, 2017

*Carlo Lovatelli*

President



*Bernardo Rudorff*

Director



*Marcos Adami*

Researcher



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## 7.1 AGROSATÉLITE GEOTECNOLOGIA APLICADA LTDA.

- **General Coordinator:** Bernardo Rudorff

- **Technical Coordinator:** Joel Rizzo

- **Technical Team:** Charles Baldi, Daniel Alves de Aguiar, Luciana Oliveira, Marco Aurélio Virtuoso and Moisés Pereira Galvão Salgado.

## 7.2 INPE

- **Auditor:** Marcos Adami

## 7.3 ABIOVE

- **General Coordinator:** Carlo Lovatelli

- **Technical Coordinator:** Bernardo Machado Pires

- **Staff Members:** Cindy Silva Moreira, Daniel Furlan Amaral and Pedro Moré Garcia



## 8.1 Polygons with soy in Mato Grosso (MT)

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
1682	854	MT	Bom Jesus do Araguaia	5
1568	37	MT	Brasnorte	6
628	710	MT	Canarana	219
1821	501	MT	Cláudia	127
1839	573	MT	Cláudia	450
1886	93	MT	Cláudia	93
1891	38	MT	Cláudia	38
1899	218	MT	Cláudia	218
1902	38	MT	Cláudia	36
1964	50	MT	Cláudia	42
1987	647	MT	Cláudia	647
1993	43	MT	Cláudia	5
2003	42	MT	Cláudia	42
2046	215	MT	Cláudia	53
2052	28	MT	Cláudia	20
2113	39	MT	Cláudia	11
2125	152	MT	Cláudia	104
2154	286	MT	Cláudia	73
2802	46	MT	Colíder	41
428	28	MT	Comodoro	10
437	35	MT	Comodoro	15
441	32	MT	Comodoro	15
690	29	MT	Comodoro	5
845	74	MT	Comodoro	53
388	25	MT	Diamantino	25
391	85	MT	Diamantino	85
881	828	MT	Feliz Natal	613
883	177	MT	Feliz Natal	28
887	37	MT	Feliz Natal	33
919	1,028	MT	Feliz Natal	719
928	737	MT	Feliz Natal	91
953	750	MT	Feliz Natal	193
968	71	MT	Feliz Natal	71
981	3,702	MT	Feliz Natal	1,984

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
1005	508	MT	Feliz Natal	406
1045	34	MT	Feliz Natal	2
1066	1,127	MT	Feliz Natal	20
1076	36	MT	Feliz Natal	10
1107	860	MT	Feliz Natal	567
1135	772	MT	Feliz Natal	116
1154	25	MT	Feliz Natal	25
1155	42	MT	Feliz Natal	31
1161	37	MT	Feliz Natal	27
1196	582	MT	Feliz Natal	244
1245	170	MT	Feliz Natal	168
1273	228	MT	Feliz Natal	121
1321	1,153	MT	Feliz Natal	435
1330	369	MT	Feliz Natal	19
1333	38	MT	Feliz Natal	7
1342	1,422	MT	Feliz Natal	116
1351	172	MT	Feliz Natal	50
1356	223	MT	Feliz Natal	71
1366	254	MT	Feliz Natal	182
1519	223	MT	Feliz Natal	19
1661	76	MT	Feliz Natal	63
563	238	MT	Gaúcha do Norte	20
625	424	MT	Gaúcha do Norte	93
631	143	MT	Gaúcha do Norte	143
641	84	MT	Gaúcha do Norte	84
645	1,198	MT	Gaúcha do Norte	191
650	29	MT	Gaúcha do Norte	8
694	53	MT	Gaúcha do Norte	6
738	29	MT	Gaúcha do Norte	4
740	32	MT	Gaúcha do Norte	32
1510	489	MT	Ipiranga do Norte	407
1686	167	MT	Ipiranga do Norte	145
1692	1,703	MT	Ipiranga do Norte	812
1806	44	MT	Ipiranga do Norte	32
1822	465	MT	Ipiranga do Norte	192
1275	65	MT	Itanhangá	65
1276	186	MT	Itanhangá	186
1306	39	MT	Itanhangá	36
1327	136	MT	Itanhangá	136
1328	45	MT	Itanhangá	41

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
1338	203	MT	Itanhangá	35
1346	45	MT	Itanhangá	43
1361	267	MT	Itanhangá	7
1365	237	MT	Itanhangá	40
1503	104	MT	Itanhangá	9
1560	25	MT	Itanhangá	6
1566	57	MT	Itanhangá	21
1616	237	MT	Itanhangá	154
1643	1,476	MT	Itanhangá	932
1655	325	MT	Itanhangá	195
1683	1,670	MT	Itanhangá	331
2234	80	MT	Itaúba	17
2333	1,212	MT	Itaúba	3
2345	179	MT	Itaúba	102
2354	789	MT	Itaúba	23
2380	425	MT	Itaúba	404
743	64	MT	Lucas do Rio Verde	6
757	453	MT	Lucas do Rio Verde	98
765	149	MT	Lucas do Rio Verde	62
2288	34	MT	Marcelândia	11
2389	62	MT	Marcelândia	7
2407	130	MT	Marcelândia	19
2425	130	MT	Marcelândia	4
2436	230	MT	Marcelândia	119
2453	25	MT	Marcelândia	15
2457	94	MT	Marcelândia	81
2472	37	MT	Marcelândia	25
2514	65	MT	Marcelândia	56
2529	36	MT	Marcelândia	5
2538	289	MT	Marcelândia	131
2653	39	MT	Marcelândia	16
2755	659	MT	Marcelândia	33
2803	27	MT	Marcelândia	20
2810	70	MT	Marcelândia	62
2822	55	MT	Marcelândia	32
2831	73	MT	Marcelândia	13
3277	26	MT	Matupá	26
3388	44	MT	Matupá	29
3392	27	MT	Matupá	13
3536	113	MT	Matupá	93

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
3551	289	MT	Matupá	258
3561	92	MT	Matupá	79
3213	32	MT	Nova Guarita	13
651	110	MT	Nova Maringá	79
667	255	MT	Nova Maringá	252
699	81	MT	Nova Maringá	72
707	36	MT	Nova Maringá	12
722	31	MT	Nova Maringá	31
759	589	MT	Nova Maringá	6
780	248	MT	Nova Maringá	9
781	65	MT	Nova Maringá	46
811	55	MT	Nova Maringá	24
813	49	MT	Nova Maringá	16
818	453	MT	Nova Maringá	453
819	2,315	MT	Nova Maringá	381
847	27	MT	Nova Maringá	27
852	71	MT	Nova Maringá	71
914	60	MT	Nova Maringá	60
950	153	MT	Nova Maringá	136
963	264	MT	Nova Maringá	264
1294	439	MT	Nova Maringá	435
1303	132	MT	Nova Maringá	92
1518	40	MT	Nova Maringá	40
1565	43	MT	Nova Maringá	24
1588	344	MT	Nova Maringá	344
1615	413	MT	Nova Maringá	337
2357	161	MT	Nova Santa Helena	33
2366	36	MT	Nova Santa Helena	36
2370	28	MT	Nova Santa Helena	18
2441	60	MT	Nova Santa Helena	60
2602	145	MT	Nova Santa Helena	145
515	262	MT	Nova Ubiratã	262
547	91	MT	Nova Ubiratã	91
549	951	MT	Nova Ubiratã	168
551	797	MT	Nova Ubiratã	564
552	225	MT	Nova Ubiratã	225
698	27	MT	Nova Ubiratã	25
721	394	MT	Nova Ubiratã	32
724	27	MT	Nova Ubiratã	27
732	67	MT	Nova Ubiratã	51

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
793	43	MT	Nova Ubiratã	12
798	33	MT	Nova Ubiratã	33
843	67	MT	Nova Ubiratã	67
859	142	MT	Nova Ubiratã	142
862	107	MT	Nova Ubiratã	10
884	2,234	MT	Nova Ubiratã	162
986	278	MT	Nova Ubiratã	2
1163	43	MT	Nova Ubiratã	15
1390	645	MT	Nova Ubiratã	645
3672	33	MT	Novo Mundo	4
3726	41	MT	Novo Mundo	9
810	34	MT	Paranatinga	34
2894	298	MT	Peixoto de Azevedo	28
2895	48	MT	Peixoto de Azevedo	6
2493	31	MT	Porto Alegre do Norte	27
2494	171	MT	Porto Alegre do Norte	17
1619	98	MT	Porto dos Gaúchos	98
1685	62	MT	Porto dos Gaúchos	57
1708	28	MT	Porto dos Gaúchos	26
1728	677	MT	Porto dos Gaúchos	18
1767	70	MT	Porto dos Gaúchos	58
1772	28	MT	Porto dos Gaúchos	28
1774	891	MT	Porto dos Gaúchos	862
1789	68	MT	Porto dos Gaúchos	68
1792	1,195	MT	Porto dos Gaúchos	735
1827	30	MT	Porto dos Gaúchos	30
1874	788	MT	Porto dos Gaúchos	482
1913	51	MT	Porto dos Gaúchos	33
686	43	MT	Querência	38
952	43	MT	Querência	38
1075	260	MT	Querência	8
1570	294	MT	Santa Carmem	3
1575	222	MT	Santa Carmem	152
1605	43	MT	Santa Carmem	41
1614	41	MT	Santa Carmem	41
1644	46	MT	Santa Carmem	29
1673	1,562	MT	Santa Carmem	1,562
1680	47	MT	Santa Carmem	32
1689	356	MT	Santa Carmem	356
1697	777	MT	Santa Carmem	757

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
1699	246	MT	Santa Carmem	53
1700	56	MT	Santa Carmem	47
1707	171	MT	Santa Carmem	171
1714	54	MT	Santa Carmem	48
1745	51	MT	Santa Carmem	39
1750	95	MT	Santa Carmem	23
1760	42	MT	Santa Carmem	41
1763	75	MT	Santa Carmem	25
1828	73	MT	Santa Carmem	51
1829	228	MT	Santa Carmem	228
1848	1,943	MT	Santa Carmem	531
1865	126	MT	Santa Carmem	126
1981	337	MT	São Félix do Araguaia	337
1988	59	MT	São Félix do Araguaia	59
2001	120	MT	São Félix do Araguaia	48
2084	32	MT	São Félix do Araguaia	32
595	38	MT	São José do Rio Claro	29
656	47	MT	São José do Rio Claro	39
1833	168	MT	Sinop	168
1840	92	MT	Sinop	92
1854	54	MT	Sinop	13
1958	436	MT	Sinop	389
1960	27	MT	Sinop	9
1979	568	MT	Sinop	562
1410	175	MT	Sorriso	175
1933	322	MT	Tabaporã	309
2007	103	MT	Tabaporã	103
2033	376	MT	Tabaporã	372
2065	43	MT	Tabaporã	40
804	92	MT	Tapurah	79
829	92	MT	Tapurah	6
848	38	MT	Tapurah	38
853	42	MT	Tapurah	42
911	258	MT	Tapurah	105
958	387	MT	Tapurah	125
996	159	MT	Tapurah	159
1007	28	MT	Tapurah	19
1013	78	MT	Tapurah	78
1017	606	MT	Tapurah	267
1025	38	MT	Tapurah	30

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
1219	284	MT	Tapurah	284
1226	393	MT	Tapurah	287
2688	61	MT	Terra Nova do Norte	37
2690	81	MT	Terra Nova do Norte	3
2706	98	MT	Terra Nova do Norte	22
2725	885	MT	Terra Nova do Norte	247
2981	36	MT	Terra Nova do Norte	5
1752	486	MT	União do Sul	486
1783	79	MT	União do Sul	79
1809	191	MT	União do Sul	191
1863	557	MT	União do Sul	287
1878	1,222	MT	União do Sul	1,222
1912	139	MT	União do Sul	132
1918	84	MT	União do Sul	84
1938	365	MT	União do Sul	38
2056	26	MT	União do Sul	26
2079	30	MT	União do Sul	17
2097	25	MT	União do Sul	7
2164	38	MT	União do Sul	38
926	123	MT	Vera	123
941	204	MT	Vera	204
1369	142	MT	Vera	141
1434	99	MT	Vera	90
1446	39	MT	Vera	29
212	32	MT	Vila Bela da Santíssima Trindade	19
320	27	MT	Vila Bela da Santíssima Trindade	27
3465	32	MT	Vila Rica	13
3467	34	MT	Vila Rica	2
3512	40	MT	Vila Rica	31
<b>TOTAL MT</b>				<b>36,134</b>

## 8.2 Polygons with soy in Pará (PA)

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
5413	162	PA	Belterra	66
5415	26	PA	Belterra	26
5739	57	PA	Belterra	45
5740	40	PA	Belterra	37
4812	37	PA	Dom Eliseu	34
4813	143	PA	Dom Eliseu	143

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
4814	328	PA	Dom Eliseu	220
4817	41	PA	Dom Eliseu	41
4823	93	PA	Dom Eliseu	56
4837	88	PA	Dom Eliseu	88
4849	177	PA	Dom Eliseu	177
4851	83	PA	Dom Eliseu	78
4858	102	PA	Dom Eliseu	15
4864	37	PA	Dom Eliseu	30
4884	33	PA	Dom Eliseu	23
4899	31	PA	Dom Eliseu	20
4902	28	PA	Dom Eliseu	28
4914	243	PA	Dom Eliseu	219
4919	60	PA	Dom Eliseu	60
4922	53	PA	Dom Eliseu	53
4937	401	PA	Dom Eliseu	9
4938	109	PA	Dom Eliseu	3
4944	157	PA	Dom Eliseu	15
4949	35	PA	Dom Eliseu	29
4956	45	PA	Dom Eliseu	45
4961	54	PA	Dom Eliseu	10
4974	2,674	PA	Dom Eliseu	293
4984	39	PA	Dom Eliseu	39
5003	111	PA	Dom Eliseu	100
5045	54	PA	Dom Eliseu	6
5060	98	PA	Dom Eliseu	24
5069	26	PA	Dom Eliseu	15
5070	383	PA	Dom Eliseu	19
5077	28	PA	Dom Eliseu	3
5112	765	PA	Dom Eliseu	85
5132	363	PA	Dom Eliseu	50
5164	574	PA	Dom Eliseu	304
5648	29	PA	Ipixuna do Pará	29
5657	72	PA	Ipixuna do Pará	70
5691	52	PA	Ipixuna do Pará	44
5705	34	PA	Mojuí dos Campos	27
5714	42	PA	Mojuí dos Campos	13
5741	32	PA	Mojuí dos Campos	12
5730	39	PA	Nova Esperança do Piriá	23
5837	34	PA	Nova Esperança do Piriá	31
5311	74	PA	Paragominas	74



ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
5326	184	PA	Paragominas	184
5372	27	PA	Paragominas	27
5379	50	PA	Paragominas	50
5390	150	PA	Paragominas	83
5391	85	PA	Paragominas	85
5394	436	PA	Paragominas	349
5412	124	PA	Paragominas	114
5417	112	PA	Paragominas	27
5420	44	PA	Paragominas	44
5427	1,770	PA	Paragominas	813
5428	99	PA	Paragominas	50
5431	48	PA	Paragominas	48
5435	25	PA	Paragominas	25
5436	167	PA	Paragominas	134
5467	93	PA	Paragominas	41
5483	377	PA	Paragominas	66
5502	300	PA	Paragominas	201
5513	70	PA	Paragominas	70
5554	52	PA	Paragominas	52
5596	28	PA	Paragominas	15
5603	32	PA	Paragominas	5
5620	30	PA	Paragominas	30
5627	153	PA	Paragominas	141
5637	43	PA	Paragominas	43
5649	135	PA	Paragominas	61
5663	52	PA	Paragominas	46
5666	51	PA	Paragominas	51
5717	62	PA	Paragominas	62
4587	317	PA	Rondon do Pará	83
4613	31	PA	Rondon do Pará	5
4687	31	PA	Rondon do Pará	12
4690	33	PA	Rondon do Pará	33
4825	34	PA	Rondon do Pará	34
4829	394	PA	Rondon do Pará	52
4833	470	PA	Rondon do Pará	24
3869	49	PA	Santana do Araguaia	21
5729	55	PA	Santarém	46
5799	66	PA	Santarém	15
5827	31	PA	Santarém	31
87	36	PA	Tailândia	32

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
5145	87	PA	Ulianópolis	23
5172	259	PA	Ulianópolis	211
5194	102	PA	Ulianópolis	82
5199	81	PA	Ulianópolis	28
5201	312	PA	Ulianópolis	291
5204	136	PA	Ulianópolis	96
5212	1,344	PA	Ulianópolis	224
5223	38	PA	Ulianópolis	38
5286	509	PA	Ulianópolis	64
5290	30	PA	Ulianópolis	3
5298	38	PA	Ulianópolis	27
5300	82	PA	Ulianópolis	19
5301	148	PA	Ulianópolis	148
5304	28	PA	Ulianópolis	28
<b>TOTAL PA</b>				<b>7,418</b>

### 8.3 Polygons with soy in Rondônia (RO)

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
474	42	RO	Cabixi	36
488	48	RO	Cabixi	39
504	42	RO	Cabixi	42
512	104	RO	Cabixi	104
541	27	RO	Cabixi	27
730	35	RO	Corumbiara	35
773	83	RO	Corumbiara	79
539	91	RO	Pimenteiras do Oeste	16
558	390	RO	Pimenteiras do Oeste	368
569	894	RO	Pimenteiras do Oeste	625
838	77	RO	Vilhena	15
840	96	RO	Vilhena	58
842	106	RO	Vilhena	9
871	306	RO	Vilhena	127
885	371	RO	Vilhena	22
<b>TOTAL RO</b>				<b>1,602</b>

## 8.4 Polygons with soy in Maranhão (MA)

ID	Polygon Area (ha)	State	Municipality	Soy Acreage (ha)
4559	74	MA	Açailândia	33
4561	60	MA	Açailândia	21
4615	335	MA	Açailândia	244
4623	34	MA	Açailândia	28
4627	26	MA	Açailândia	17
4628	136	MA	Açailândia	115
4634	49	MA	Buriticupu	49
4649	26	MA	Buriticupu	26
4657	119	MA	Buriticupu	119
4660	30	MA	Açailândia	20
4671	518	MA	Buriticupu	477
4674	229	MA	Buriticupu	229
4684	96	MA	Buriticupu	68
4692	27	MA	Itinga do Maranhão	17
4698	53	MA	Açailândia	13
4716	28	MA	Açailândia	15
4724	96	MA	Açailândia	96
4727	99	MA	Açailândia	11
4745	93	MA	Açailândia	74
4747	46	MA	Açailândia	41
4777	54	MA	Buriticupu	54
4809	99	MA	Buriticupu	20
4811	61	MA	Buriticupu	9
4815	51	MA	Buriticupu	23
4820	99	MA	Açailândia	99
4916	96	MA	Itinga do Maranhão	55
4929	57	MA	Itinga do Maranhão	21
4933	58	MA	Itinga do Maranhão	51
4942	40	MA	Itinga do Maranhão	15
4948	60	MA	Itinga do Maranhão	55
4966	295	MA	Itinga do Maranhão	23
5090	375	MA	Itinga do Maranhão	74
<b>TOTAL MA</b>				<b>2,212</b>

## EXECUTION



## GTS – SOY WORKING GROUP



MINISTÉRIO DO  
MEIO AMBIENTE

