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# REPORTING ON RESULTS INDICATORS – GUIDANCE FOR LARGE FARMS

**APPLICABLE FROM 2014 HARVEST SEASON**

## Overview

This document describes how to use the Results Indicators Report provided by BCI to assist large farms in the annual collection and reporting of the Results Indicators. It includes:

1. Guidance for data reporting, cleaning, and feedback.
2. For each Result Indicator, an explanation of how to report the required information, including units to be used and guidance on specific measurements and calculations.

## 1. Guidance for Data Reporting, Cleaning, and Feedback

### 1.1 Results Indicators Report for Large Farms

The Results Indicators Report for large farms has two worksheets, both for data entry. The first concerns data related to cotton production, area harvested, water use, and fertiliser use. The second worksheet holds data on pesticide use. The farm enters data into the report in Excel format and sends it via email to BCI within 12 weeks of harvest finishing.

### 1.2 Data Cleaning

Data from each farm as presented in the Results Indicators Reports are uploaded by BCI into a statistics programme to be analysed. The first step consists of data cleaning. Dubious values, or outliers, are statistically identified. BCI will send a list of values to be verified.

Every dataset contains errors that can come from data entry or from measurement errors. Dubious values (outliers) may indicate errors. It is important to keep in mind that some correct values may be extreme and that the doubtful values identified by the data cleaning are not necessarily erroneous. This is why data cleaning does not rely on statistics alone. BCI will send a list of dubious data and request they are double-checked. Given that it may be too difficult to go all the way back to farmers to verify the data, this process is particularly aimed at correcting data entry errors. It is also expected to put some more light on specific situations that may explain differences observed.

### 1.3 Feedback

Results indicators are not automatically calculated based on the data entered into the templates. Rather, once the data have been imported into the database and cleaned, BCI will share with farms summary information on results.

## 2. Explanation of Reporting Results Indicators

The BCI Results Indicators are designed to capture comparable information about the results achieved by Better Cotton farmers around the world. While farmers in different countries use a variety of units of measure, it is essential that Results Indicators are reported in the required units to achieve standardisation across the Better Cotton System. For example, BCI expresses all agronomic and economic indicators on a per hectare basis. The accuracy of the production area expressed in terms of hectares is thus very important.

### 2.1 Identification, Area, Production

#### Identification

Enter the name or other identifier of the farm and the status of the farm (Better Cotton or control).

#### Total Area Harvested

- The total cotton production area is indicated in **hectares**.
- The total area harvested should be indicated (not the area initially planted).

#### Total Seed Cotton Harvested

- The total cotton production is indicated in **kilograms** of **seed** cotton. Large farms have the option to report the production in terms of lint cotton as well; however, the amount of seed cotton should also be recorded.
- The yield is calculated as the volume of cotton harvested per hectare. This calculation is done automatically on the third worksheet of the report.

### 2.2 Water Use for Irrigation

Water extracted to irrigate the cotton crop during the season (including any pre-watering or watering-up irrigations required to prepare the seed bed or establish the crop) is measured. A cotton crop should be considered as irrigated if it receives one or more irrigations. Rainwater is not recorded.

- Farmers record the total volume of water used for irrigation in **cubic meters** ( $m^3$ ),  $1 m^3 = 1,000$  litres). The area of cotton actually irrigated with the water is also recorded.
- Ideally, farmers will use water meters to measure the volume of water extracted for irrigating the cotton crop. If water meters are not installed, then flow rates will need to be estimated.
- Description of the estimation of flow rate:

For water that is delivered via a pipe, if the flow rate is not too great, the flow rate can be estimated using a container of known volume by timing how long it takes to fill the container. For water delivered via canal, channel, or ditch, various methods are available for estimating flow rates. Please contact BCI for further information on methods for estimating flow rates in open canals.



Once the flow is estimated, the duration of each irrigation should be recorded. The total volume applied will be the product of the total duration of all irrigations multiplied by the flow rate.

Parameter	Estimated flow rate	Estimated flow rate	Duration of all irrigations	Total volume (m <sup>3</sup> )
Unit	Litres per minute	Litres per hour	In hours	Cubic meters (m3)
Formula	See description for estimating flow rate	= Estimated flow rate per minute x 60	= Sum (irrig.1 +irrig.2 +...)	= (duration of all irrigations x flow rate) / 1000
Example	1,200	72,000	12	864

### 2.3 Fertiliser Use

The term 'fertiliser' covers mineral, organic, or synthetic fertilisers and includes soil conditioners applied to the cotton field after the harvest of the previous crop (whether cotton or another crop).

- Report the total volume (in **kilogram or litre**) of fertiliser applied to the cotton field either prior to planting or during the season.
- The Result Indicator template contains a list of commonly used fertilisers with a set composition (e.g. urea, Nitrophos, Di Ammonium Phosphate, etc). For all other fertilisers used, large farms must indicate the typical analysis of commercial fertilisers (% Nitrogen, Phosphorous, Potassium, etc.). There are a set of columns to the right of the fertiliser section in which other formulations of fertiliser can be recorded.
- Chemical analyses are not required to determine the nutrient levels of non-standard or home-made fertilisers.

### 2.4 Pesticide Use

The term 'pesticide' includes insecticides, herbicides, acaricides, and fungicides applied in any way to the field between the harvesting of any previous crop (including non-cotton crops) and the harvesting of the cotton crop under consideration.

- Report the total volume (in **kilogram or litre**) of pesticide applied to the cotton crop each year per active ingredient.
- The exact concentration of active ingredient of each product must be recorded. Pesticide labels should indicate, in addition to the trade name, the name of the active ingredient as well as its concentration. The concentration should be indicated in **grams per kilogram / litre**. For example, a concentration of active ingredient of 20% should be recorded as 200 (200 gram per litre corresponds to 20%).
- The Results Indicator report contains a list of commonly used trade names and their active ingredients. For each, the common concentration of active ingredient is provided. If a pesticide of the same active ingredient is used but with another concentration, this is added into one of the modifiable columns in the compilation report.
- Where a pesticide applied is a mixture of at least two active ingredients, the pesticide is considered as a mixed pesticide and the concentrations of all active ingredients are recorded.
- Where home-made botanical pesticides are used with an unknown concentration, a concentration of '1000' should be used.

Based on the total volume of pesticide applied and the concentration of active ingredient, BCI calculates the amount of active ingredient applied for commercial and organic pesticides. Farms do not have to make this calculation. The calculation used is as follows:

1. To convert from volume of pesticide applied to weight of active ingredient applied, the total volume or weight applied (in litres or kilograms) is multiplied by the product concentration (in grams of active ingredient per litre or kilogram) and divided by 1,000 to give a result in kilograms of active ingredient applied.
2. The total weight of active ingredient applied (in kilograms) is then calculated by summing the individual results for each of the different pesticides applied.
3. The total weight of each pesticide applied is then divided by the total number of hectares of cotton grown by the farmers from whom the data on pesticide application was collected, so that an average of kilograms of active ingredient applied per hectare for each different active ingredient can be reported.

For the purposes of calculating the average use of active ingredient per hectare, the total area harvested is used, irrespective of whether each pesticide was used across the entire farm or only a portion.