

PET-Cereals
West Bank and Gaza Strip

A Pictorial Evaluation Tool for Cereal Harvest Assessment in West Bank and Gaza Strip (WBGS)




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Contents

What is PET-Cereals (WBGS)?

This book is called PET-Cereals(WBGS). It shows you HOW TO USE PICTURES to estimate the amount of cereal grain and straw in fields at harvest time. The book contains photographs of wheat and barley crops, arranged according to levels of production that are called *photo-indicators*. By comparing these *photo-indicators* with the crop in a field, you can decide how much grain and straw may be harvested from that field.

When you estimate the production from a standing crop in the field at harvest time, it is called a **crop assessment**. PET-Cereals(WBGS) will help you to complete a rapid crop assessment for a farm, for a village, for a locality and for a state.

Whatever the situation you are working in:-

Production = Area x Yield per unit area.

Therefore, to estimate the harvest you will need to know:-

1. The size or **area** of the crop to be harvested, as well as,
2. Average **crop yield** per unit area of the land to be harvested.

Area: At the simplest level of assessment, field size and farm size may be measured or told to you by the farmer. At the village or locality level, crop areas can be estimated either i) by collecting data from all of the farmers and adding them together, or, ii) by taking samples from a few farmers and multiplying the sample averages by the number of families farming in the village or locality.

The local authorities, ministries or commissions usually do such exercises. In WBGS, the Ministry of Agriculture could use either method by a) estimating crop areas from all farmers or from a sample of farmers in each locality (as described above); b) adding up the areas, at locality level, for each crop; c) adding together all the locality data for each crop to give an estimate of the harvest at *Governorate* level; and, d) adding all *Governorate* data together to arrive at an estimate of area for each crop at *national* level.

Where such levels of organisation are not available, methods used to calculate crop area are different. Area farmed may be calculated by multiplying estimates of numbers of households or businesses farming by the average area known to have been farmed in the past, adjusted by data obtained during the assessment for the year in question including:-

- data collected from statements by individual farmers;
- data collected by active administrations;
- data collected by projects and NGOs;
- data extrapolated from household surveys by other agencies;
- remote sensed data.

Area estimates[1] for each crop are then multiplied by estimates of crop yield per unit area to determine production.

Crop yield from a known area of land: To estimate crop yield from a known area, you could harvest the whole area and weigh the crop or, much easier, you could mark out a sample plot of known area in the field, then harvest and weigh the crop within it. For small fields of less than one hectare, with an even crop, an area of one square metre (**1 m^2**) may be cut, harvested and weighed and the crop yield recorded as the weight of crop harvested per one square metre or crop yield/m^2. This sum may then be multiplied by 1,000 to obtain the estimated yield per *dunam* or by 10,000 to obtain an estimate of the yield per *hectare* (ha).

If the field is large and variable you may have to take more than one sample, add up the values and take the average to get a representative estimate of the production of the whole field. However, taking samples from each field is a time-consuming process. During rapid assessments there is usually NOT ENOUGH time to sample every field. Therefore, PET-Cereals (WBGS) has been prepared to provide ALL ASSESSORS with a manual containing a) ***photo-indicators*** of wheat and barley crops in WBGS with different levels of production; and b) instructions on how to use the ***photo-indicators*** to assess the yields of grain and straw. The photo-indicators, prepared from actual fields in West Bank and Gaza Strip, have been grouped in high, medium and low clusters (these are arbitrary terms). You can choose the photo-indicator that best matches the field you are working in and then read off the probable yield from the relevant data column.

The actual yields achieved will depend on the season, so all the photo-indicators will need to be consulted for all locations – that is, it is important not to pre-judge what photo-indicator will apply, based on any general impressions about how "good" the season is said to be.

[1] More information to help you estimate area in the field is given in Annex 6.

Using PET-Cereals (WBGS) **means:**

Looking at the field- Looking at the photo-indicators-
Picking the photo-indicator that matches your field-
Reading off the yield in kilograms per dunam
(kg/dunam) or tonnes per hectare (t/ha).

The crop yield at harvest will differ every year in the same fields. This means that, in order to get a good idea of crop yield at field, farm, village and locality level, you will need to cover vast distances and visit many farms. Proper use of the manual allows you to decide for yourself how much cereal will be harvested from every field seen. You can then compare your estimates with information given by farmers, other agencies and authorities.

Using PET-Cereals (WBGS) **will allow you to complete all wheat and barley assessments within the time available and with confidence. The advantages of using the PET approach, versus crop assessments based on agricultural statistics and census data are presented in Annex 5.**

The methodology that was used in preparing PET-Cereals (WBGS) **is summarised below:-**

- **Preliminary discussions identified the crops to be included as wheat and barley for both grain and straw production;**
- **Reconnaissance surveys in each Governorate identified both the scope and range of performance of both crops at all locations within the Governorate;**
- **Stratified sampling was then undertaken in specific locations selected jointly by the FAO/MoA PET team and local MoA office subject matter specialists as being representative of the range of performance noted in reconnaissance surveys;**
- **Within those selected locations, representative fields were selected and sub-sampled to offer 1m^2 plots delivering the most informative photo-indicators;**
- **Photo-indicators of standing crops were prepared at each site;**
- **The 1m^2 plots were harvested and threshed;**
- **Photo-indictors of products after harvest were prepared at each site;**
- **All product samples were weighed to constant weight to determine the exact production obtained from 1m^2;**
- **All weights were recorded and ultimately entered into the PET manual alongside the photo-indicators from the same plots.**

The map provided in Annex 5 illustrates the location of the sample and photo-indicator sites.

BEFORE YOU START

It is important that you spend time reading this introduction. It explains how to use PET-Cereals (WBGS) correctly and how to check your results.

In the gallery of photo-indicators beginning on page 21 of PET-Cereals (WBGS) you will find photographs of crops of wheat and barley with known yields of grain and straw. Due to their equal importance to the rural economy grain and straw are presented in separate sections.

All the photographs in the manual were taken of crops growing in WBGS. Also, all the photos and related data collected were obtained in the presence of senior MoA and FAO-WBGS staff, who were there when fields were selected and grain and straw samples taken and weighed.

The presentation of the photo-indicators of each product follows a similar sequence conforming to all recent PET-Crop manuals used in other countries. Each yield range indicated (high, medium or low) has a double page spread of three **rows of photographs** divided into **five columns** showing **(1)** field **from-a-distance**; **(2)** 1m^2 in **close-up**; **(3)** the **harvest** taken from 1m^2; and, **(4)** the **product** i.e. **grain** (or **straw)** harvested from the 1m^2; **(5)** yield estimate figures in kilograms per dunam (kg/dunam) and tonnes per hectare (t/ha).

NB The photographs of biomass, grain and straw (columns 3 and 4) placed between the **close-up** photos and the **yield** estimates are present to show you how the yield was derived and what the **biomass, grain production and straw production** from **one square metre** looks like when compared to an **A4 sheet of paper** and a **sickle** placed on the ground next to the products.

	**(1) From-a-distance:** these photographs show you the field from-a-distance, giving you an idea of the *health* of the cereal, *how many* plants are in the field, how *uniformly* they have grown, how *weedy* the field has become and how well the harvestable parts have *developed.*
	**(2) Close-up:** the photographs of a close view of the crop show the *spikes* (heads) in an area of **1m^2.** The photographs show the extent of the cover of the space (canopy) and the size and quality of the harvestable parts of the crop, in this case the wheat spikes and straw stems.
	**(3) The harvest:** the photographs of the harvest show those parts of the crop that have been harvested from the typical area of 1m^2 shown in the close-up photograph. In this case, the wheat stems have been cut at ground level showing straw and spikes. Information provided is the number of spikes (and stems) per m^2.
	**(4) The grain**: the photographs show grain threshed from the harvest and air dried to constant weight**.** Yield is shown in g/m^2 extrapolated to **kg/dunam** and **t/ha.** In the straw section of photos, the grain product is replaced by a photo-indicator of the straw remaining after threshing, with yields shown as **kg/dunam** and **t/ha.** The products of all crops in this manual were air-dry at harvest.

When actually using the manual in the field you should move directly from the **close-up** (2) to the **yield** estimate, only harvesting the product of 1m^2 from time-to-time to check your judgement.

STEP 1
Is it a 'high', 'medium' or 'low' crop?

In Step 1, you decide if the general condition of the field is indicative of a 'high', 'medium' or 'low' crop. To do this you should look at the *'From-a-distance'* photographs in the photographic guide and compare these with the farmer's field in which you have interest. Looking *from-a-distance* will give you an impression of the overall quality of the crop and tell you if the crop is variable or even.

Turn to the photographic guide beginning on page 21 and select the cereal you wish to assess. Look at the **'from-a-distance'** photographs for high (red band), medium (yellow band) and low (blue band) levels of production for that cereal.

There are three *photo-indicators* within each of these bands, making nine choices from which to select your crop for grain and for straw. The photographs have been taken from a distance of several metres. If you stand at a similar distance from the field (or you can do this from a slow moving vehicle), you can compare your crop with the *photo-indicators*. By looking at the whole field, you can decide which photograph is most similar to your crop. There are notes next to the **'from-a-distance'** photographs; read these carefully because they will tell you what to look for when deciding if your field is in the **'high'**, **'medium'** or **'low'** range.

The following pictures summarise the process of placing your crop in the **'high' (red)**, **'medium' (yellow)** or **'low' (blue)** range.