



Fertilizer Use by Crop and Country for the 2017-2018 period

IFA Secretariat



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Introduction

Understanding how much mineral fertilizer (referred to hereafter as fertilizer) is applied to different crops at national, regional and global levels is an essential component of fertilizer consumption analysis and demand projection. It is also a prerequisite for numerous other forms of market research and scientific assessment. For example, data on actual fertilizer use by crop are critical information for constructing nutrient input-output budgets, quantifying nutrient use efficiency at national to global scales, and monitoring trends over time. This also allows studying the impact of nutrient-related policies and stewardship practices, or assessing potential risks associated with nutrient surpluses or soil nutrient mining.

Good information on fertilizer use by crops (FUBC) is rarely available because it is difficult to collect and time-consuming to process and validate. In a limited number of countries, official agricultural statistics track fertilizer consumption by nutrients, crops or fertilizer products. But only a small subset of these countries regularly collect farm-level data on actual fertilizer use, i.e. the amounts applied to different crops and other associated nutrient management practices.

To fill this gap in data availability, a first global FUBC report was published by FAO in 1992 for the 1990/1991 period, based on an expert survey conducted jointly by FAO, IFDC and IFA. Since then, similar surveys have been carried out and published every two to four years in the main fertilizer-consuming countries. IFA has led these efforts since 2008 and, to our knowledge, to date this remains the only dataset on fertilizer use by crops and countries with a global coverage. Because these data are widely used by analysts and the global research community, it is our intention to (i) gradually increase the number of crops and countries covered and (ii) explore new data methods and data sources in order to improve the quality of the estimates.

The latest FUBC assessment was published in 2017 and referred to the 2014-2014/15 period (short: FUBC 2014). The current report refers to the period 2016-2016/17 to 2018-2018/19, but most data cover the period 2017-2018 (short: FUBC 2018). Below we discuss the methodology used, major findings, some of the main caveats, as well as needs and opportunities for future improvements. Besides this report, we also make the full dataset publicly available, including the historical data collected and published in all FUBC reports since 1992.

The full dataset can be accessed at <https://doi.org/doi:10.5061/dryad.2rbnzs7qh>.

The current survey benefited from the agronomic expertise of numerous experts to provide and validate estimates, and it is the best effort that IFA can achieve with its current resources. It provides a general overview of how fertilizers are being used worldwide, for the three main nutrients: nitrogen (N), phosphorus (P, reported here as P₂O₅) and potassium (K, reported here as K₂O). We caution, however, that for many countries the estimates provided here are associated with substantial uncertainties. Likewise, comparisons with previous reports must be made with caution because methodologies and sources of information have changed over time.

Methodology

The data presented in this report were collected primarily through an expert survey conducted among IFA's country correspondents, similar to the methodology employed in previous IFA FUBC assessments. A questionnaire example can be found in Annex 1.

Crops

The list of crops considered for this report was based on a modified and expanded version of the list of crops examined in the FUBC 2014 assessment (Table 1). Our objective was to align the crops and crop categories to FAO crop categories, in order to facilitate the analysis of the data. Since the previous survey, some crop categories were refined: maize was differentiated (where possible) into maize grain and maize green; sugar crops were separated into sugar beet and sugar cane; fibre crops were replaced by cotton. In addition, several new crops were added: rapeseed/canola, tea, coffee, cocoa, and pulses. Tree nuts were added to the fruit category. Overall, the number of crop types increased from 14 in the FUBC 2014 assessment to 21 in the current one.

Table 1: List of crops requested in the FUBC 2014 and FUBC 2018 surveys

Crops surveyed in FUBC	Crops surveyed in FUBC 2018	FAO crop name / crop
Wheat	Wheat	Wheat
Rice	Rice	Rice, paddy
Maize	Maize grain	Maize
-	Maize, green (silage, bioenergy)	Maize, green
Other cereals	Other cereals	Barley, rye, oats, triticale,
Soybeans	Soybeans	Soybeans
-	Pulses	Pulses
Oil palm	Oil palm	Oil palm fruit
-	Rapeseed/Canola	Rapeseed
Other oilseeds	Other oilseeds	Sunflower, groundnut, others
-	Pulses	Pulses
Fibre crops	Cotton	Seed cotton
Sugar crops	Sugar beet	Sugar beet
-	Sugar cane	Sugar cane
-	Tea	Tea
-	Coffee	Coffee, green
-	Cocoa	Cocoa, beans
Roots & tubers	Roots & tubers	Roots & tubers
Fruits	Fruits/tree nuts	Fruit primary, citrus fruits, tree nuts
Vegetables	Vegetables	Vegetables
Grassland	Grassland	
Other crops	Other crops ¹	Other crops

Source: IFA

¹ Note that the IFA FUBC 2018 *Other crops* category is wider than the FAO *Other crops* category. It includes, for example, other fibre crops (jute, flax, sisal, etc.) and tobacco.

Only for the purpose of this summary report, the crops surveyed (Table 1 and Annex 1) were aggregated into 14 crop categories to align with the categories used in the previous FUBC report (Table 2). For that reason, this list does not include separate crop categories for pulses, coffee, tea, cocoa etc., which were all included in the “other crops” category for visualizing the data in this report. Full data of all 21 crops are available at <https://doi.org/doi:10.5061/dryad.2rbnzs7qh> and in specific country tables published by IFA (<https://www.ifastat.org/consumption/fertilizer-use-by-crop>).

Table 2: Categorization of original crop names from survey responses into aggregate crop categories used in this summary report

Aggregate crop category	Examples of crop names given in survey responses
Wheat	Wheat
Rice	Rice, rice, paddy
Maize	Maize, maize grain, grain maize, maize green (silage, bioenergy), maize for biogas
Other cereals	Irrigated field crop, cereal, grain and other crops, grain mixed sheep and beef, other cereals, sorghum, millet, teff, fonio, barley, rye, triticale, oats
Soybeans	Soybeans
Oil palm	Oil palm fruit, oil palm
Other oil crops	Rapeseed, canola, oilseed rape, coconut, sunflower, other oil crops, other oil seeds, linseed, sesame, groundnut, peanut, olive
Fibre crops	Cotton, flax, jute
Sugar crops	Sugar beet, sugar cane
Roots/tubers	Potato, roots and tubers, root crops, cassava, taro, cocoyam, yam
Fruits/tree nuts	Fruits, melon, citrus, orange, tree nuts, vineyards
Vegetables	Vegetables, tomato, onion, garlic, sweet corn
Grassland	Grass, pasture, hay, rangeland, lucerne, perennial crops, fodder, forages,
Other crops	Forest, coffee, cocoa, tea, rubber, pulses, beans, peas, cowpea, rubber, other pulses, flowers, fresh herbs, orchards, amenity horticulture, ginger, horticulture, tobacco, short-rotation coppice, perennial biomass crops (Miscanthus, etc.), other industrial crops, other crops, residual.

Source: IFA

Country correspondents were asked to complete the questionnaire with the greatest detail possible, or to provide data for the specific crop breakdown available in their country. The task of aligning the data with FAO crop area statistics was often challenging, and in some cases even impossible. Even when correspondents were able to follow the recommended crop breakdown, minor crops for their country’s agriculture were often included in a group of crops or the category *other crops*. For example, for most EU countries, the data provided by Fertilizers Europe follow the crop breakdown that is specific to Fertilizers Europe’s annual survey. In this crop breakdown, rice is grouped with rye, triticale and oats; soybeans are grouped with sunflower and linseed, and cotton is not identified. Respondents from New Zealand grouped wheat, oats and barley into an aggregated cereal grains category. In this case the cereal grains category data had to be included in the ‘Other cereal’ crop category. The total nutrients applied to each (aggregate) crop category in each country were divided by the total area of each (aggregate) crop category in each country to estimate the mean application rates for each nutrient per hectare. The most challenging category is the grassland one as few countries report application to grassland, or they report application to some specific grassland types only (e.g. alfalfa).

For some countries, IFA was unable to obtain fertilizer use estimates for the *other crops* (or *residual*) category. Hence for these countries the calculated total quantities of nutrients applied are lower than the totals recorded in IFA's Fertilizer Consumption Database.

Variables

In former surveys, IFA asked country correspondents to provide two measures for each crop type: the nutrient quantities (N, P₂O₅ and K₂O) applied and the corresponding share of the country's total nutrient quantities applied to each crop. In the current assessment, country correspondents were also asked to provide an indication of planted area by crop type. These data allowed the calculation of average nutrient application rates by crop type.

In some countries, nutrient quantities were not available. Instead, average application rates were estimated for each crop type, and nutrient quantities were calculated by multiplying planted area with the average application rates.

Area was reported in hectares; nutrient quantities were reported in metric tonnes of nutrients; average application rates were reported in kg nutrients/ha.

Countries

An effort was made to gather data on fertilizer use by crop for a larger number of countries than in the FUBC 2014 assessment by reaching out to an extended network of correspondents and agronomic experts and by conducting an internet search for published official statistics. As a result, the number of countries covered increased from 54 in the FUBC 2014 assessment to 64 in the current assessment (Figure 1). Moreover, in the current assessment, data are provided for individual EU countries, whereas in the previous assessments data were only provided for the EU as a whole.²

Apart from 26 EU countries³, 12 new countries were added, including five in Africa (Burkina Faso, Mali, Nigeria, Senegal, Tanzania), four in Latin America (Bolivia, Paraguay, Peru, Uruguay), one in East Asia (Myanmar), one in West Asia (Israel) and one in Western and Central Europe (Norway)⁴. Uzbekistan was withdrawn from the list of examined countries due to the lack of information.

Recent estimates could not be obtained for ten large consuming countries: Australia, Bangladesh, Egypt, Indonesia, Iran, Malaysia, Mexico, Morocco, Russia and Vietnam. For these countries, the FUBC 2014 average application rates (calculated based on nutrient quantities and FAO 2014 crop area) were multiplied by 2018 FAO (harvested) crop area. The resulting nutrient quantities were adjusted so that total fertilizer use in the country matched the consumption of nutrients estimated by country from IFASTAT. For example, if the 2014 application rates were multiplied by the 2018 FAO crop areas and this resulted in a total nutrient consumption for a certain country that needed 10% more to be equivalent to the value

² In Fertilizers Europe statistics, Belgium and Luxembourg are grouped together, Malta is not present, and Norway as well as Switzerland (not EU countries) are not included.

³ In the current report looking at the 2017-2018 period, the EU still includes the United Kingdom.

⁴ The IFA regions include Africa, East Asia, Eastern Europe and Central Asia, Latin America, North America, Oceania, South Asia, West Asia, and Western and Central Europe.

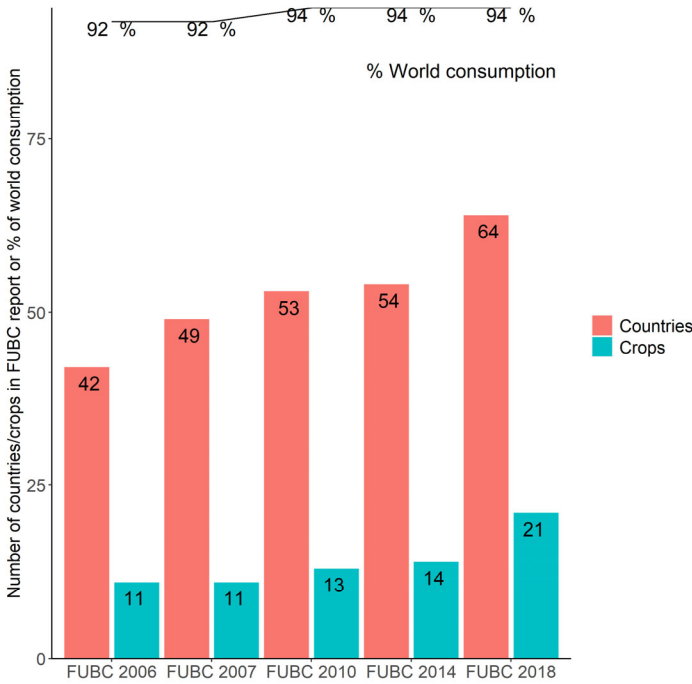
from IFASTAT then the 2014 application rates were multiplied by 1.1 to get alignment in total nutrient consumption between the two surveys.

The current survey covers more countries than the previous survey (Fig. 1) but represents the same share of global fertilizer use (94%).

Period

Country correspondents were asked to provide data for the calendar year 2018 or the fertilizer year 2018/19, or 2017 (2017/18) if more recent data were not available. As a result, 2018 (or 2018/19) estimates were collected for 32 countries (49% of the total); 2017 (or 2017/18) estimates were collected for another 30 countries (46%) including all EU countries; 2016 (or 2016/17) estimates were collected for three countries (5%). Several years of data were collected for 13 countries. Given the low prevalence of data from 2016 and 2016/17, the rates published in this assessment can be considered as representative of the period 2017-2017/18 to 2018-2018/19. Hereon, these latest survey results will be referred to as the ‘FUBC 2018’ survey.

Figure 1: Coverage of IFA FUBC surveys: number of countries, crop categories and share of world fertilizer consumption



Source: IFA

Examination and validation of collected data

The data received from correspondents were systematically examined:

- Crop area estimates were compared to published FAO crop area statistics for the same year.
- Fertilizer application rates by crop were assessed relative to expected agronomic ranges and local expertise; they were also compared to implied application rates from former FUBC surveys.

- Aggregate fertilizer consumption across all crops was compared to IFA's estimate for the same year.

Abnormal figures were discussed with the country correspondents and corrections were made if necessary. For a few specific countries and specific crops, IFA chose estimates of fertilizer use from an alternative source. In rare cases, IFA could not resolve the anomalies and decided not to publish the country data.

Adjustment of collected data

In the FUBC 2014 assessment, for each country the nutrient quantities (N, P₂O₅ and K₂O) applied by crop were adjusted to match IFA's estimated total consumption estimates (published in IFA's historical Fertilizer Consumption Database), while keeping stable the crop shares of total nutrient consumption. No such adjustment was made in the current assessment, except for Australia, Bangladesh, Egypt, Indonesia, Iran, Malaysia, Mexico, Morocco, Russia and Vietnam because for these countries no new estimates of fertilizer use by crop could be obtained for 2018.

In addition, in the FUBC 2014 assessment, IFA extrapolated fertilizer use by crop to the entire world, by developing estimates for the "rest of the world", i.e. the countries for which no data were available. This was done by adopting the consumption estimates (N, P₂O₅ and K₂O) for the relevant countries as published in IFA's historical consumption database and estimating the crop shares for that part of the world. This allowed IFA to publish estimates of fertilizer use by crop at the world level. No such extrapolation was made in the FUBC 2018 assessment, as it was considered that the 64 examined countries, accounting for 94% of global consumption, were representative of global levels of fertilizer use by crop. This implies that the total fertilizer consumption amounts reported in the current assessment (e.g. Annex 5) cannot be directly compared to the global consumption statistics published in IFA's or FAO historical fertilizer consumption databases.

Limitations

The data published in this report are estimates based on the best information available to IFA at the time the survey was conducted. They provide an indication of the order of magnitude of fertilizer application but should be used and interpreted with caution. In particular, the following issues should be taken into consideration when interpreting the data:

- The exact methodology used by country experts and statistical agencies to develop estimates of fertilizer use by crop is not known to IFA. The methodologies employed differ across countries. These experts used their own information sources to fill out the survey template, which may range from access to actual farm survey data to simply estimating representative crop breakdowns or rates applied based on their knowledge of the country.
- Crop area: Country correspondents were asked to report planted area by crop. However, in some cases harvested area was provided or FAO crop area data (harvested area) had to be used. There are often significant discrepancies in crop areas reported by different sources that affect the calculation of application rates by crops (or

total amounts). In countries where a significant share of the planted area is abandoned due to adverse weather, using the harvested area results in underestimating the area.⁵

- Direct comparison with former assessments is difficult due to the differences in crop coverage, country coverage, variables, and methodology/adjustments to data. Differences from the previous assessments can reflect changes in crop categories, crop mix, fertilizer practices, data sources/data collection, data processing or a combination of these.
- Total fertilizer use reported for a country in this report does not necessarily match the data published in IFASTAT or FAOSTAT.
- Fertilizer use refers in this report to the application of mineral fertilizer only. In some countries (for example in Europe) the application of nutrients as organic fertilizer may make up a significant component of total nutrients applied to crops.
- The period for which fertilizer use by crop was estimated depends on the country (see section “Period”).
- “Other crops” category: The other crop category includes weighted average application rates for crops included in this category (Table 2). Some countries also referred to this category as “Residual” category, whereas some countries did not report residual fertilizer use at all. Others included some of the main crops requested in the other crops (residual) category. The detailed data are available in the country tables.
- Crop calendars should be consulted to interpret the results in specific countries.⁶

China

The data gathered for China are extremely difficult to reconcile with published crop harvest area statistics and IFA’s or FAO’s published fertilizer consumption estimates. Average 2018 fertilizer application rates were collected for the major crops based on county-level statistics published by the National Development and Reform Commission of the People’s Republic of China (NDRC), but also farm survey data collected by research groups at China Agricultural University (CAU) and the Chinese Academy of Agricultural Sciences (CAAS). However, when multiplied with 2018 FAO crop area estimates, the resulting 2018 fertilizer consumption for the country exceeded the IFASTAT total national consumption estimate by 42%, and that of the National Bureau of Statistics by 15%. The gap would be even larger if average fertilizer application rates could also be obtained for minor crops.

The IFASTAT estimate of total fertilizer use in China is obtained by adding apparent consumption across all fertilizer products (apparent consumption is the sum of production, imports and beginning stocks, minus exports and ending stocks). It is possible that the IFASTAT estimate is lower than actual fertilizer consumption, but it is not expected that the actual fertilizer consumption would be 42% greater than the IFASTAT estimate.

The 42% difference could be explained by a combination of reasons: overestimated crop area, overestimated average fertilizer application rates (if less than 100% of crop area is fertilized), and/or underestimated apparent consumption. At this stage, we are not able to resolve these differences. However, considering the huge importance of the major cereal crops and the generally known uncertainties about crop harvested area statistics in China, we replaced the 2018 FAO crop area estimates for rice, wheat and maize with more accurate estimates that

⁵ Planted areas were used for 51 countries, harvested areas were used for 11 countries and ‘fertilized area’ was used for one country (Ukraine).

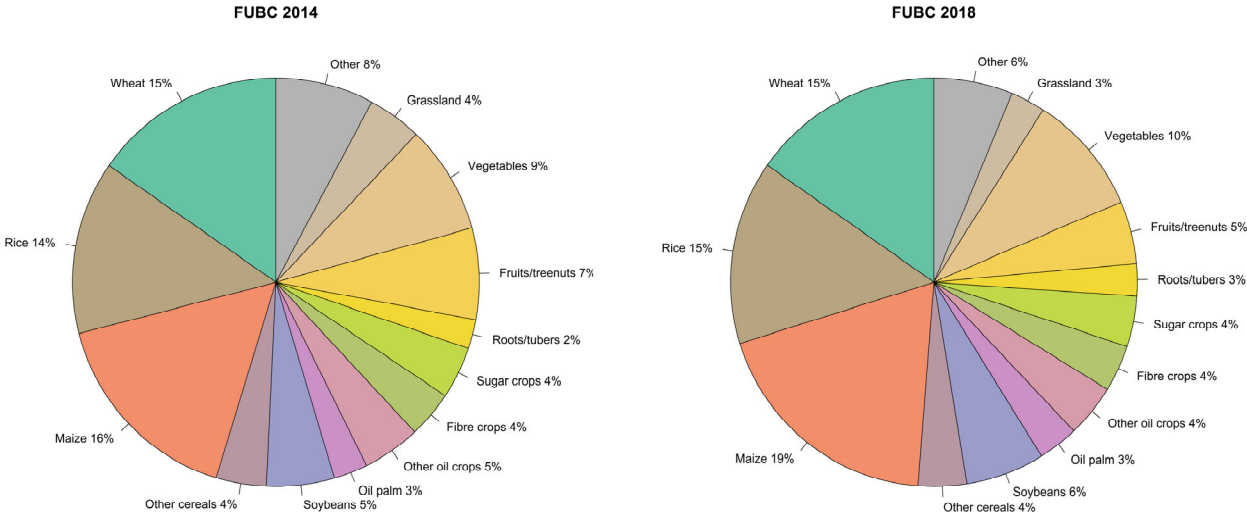
⁶ Crop calendars showing the fertilizer application periods by country and by crop are available at <https://www.ifastat.org/consumption/fertilizer-use-by-crop>.

were based on integrating multi-data sources, including remote sensing.⁷ This adjustment reduced the total consumption estimate difference to about 35% compared to IFASTAT (61.94 Mt N+P₂O₅+K₂O in this report vs. 45.75 Mt in IFASTAT). The difference was smaller for N (25%) than for P and K (44-50%).

⁷ Luo Y, Zhang Z, Ziyue L, Chen Y, Zhang L, Cao J, Tao F. 2020. Identifying the spatiotemporal changes of annual harvesting areas for three staple crops in China by integrating multi-data sources. *Environmental Research Letters* 15: 074003; available at <https://iopscience.iop.org/article/10.1088/1748-9326/ab80f0>

Fertilizer Use by Crop Category: Global Summary

Figure 2: Global mineral fertilizer use (N+P₂O₅+K₂O) by crop for the 2014-2014/15 survey period (FUBC 2014) compared with the current 2016/17-2018/19 survey period (FUBC 2018)



Source: IFA

Total fertilizer consumption

On a global scale, in 2018 cereals accounted for nearly 53% of all N+P₂O₅+K₂O applied as fertilizers (Fig. 2; Annex 2). This compares to a share of 49% in FUBC 2014 and 50% in FUBC 2010. Of the top three cereals, in 2018 maize was the greatest contributor to world fertilizer consumption (19%), followed by wheat and rice (about 15% each). Fertilizer use on other cereal crops represented only 4% of the world total.

Global fertilizer applications to soybeans represented 6% of total consumption, whereas oil palm had a share of 3% and the other oil crops 4%. Fibre and sugar crops each accounted for around 4% of world use, and roots & tubers for 3%. Fruits and vegetables together represented 15% of global fertilizer use, with fruits (including tree nuts) consuming 5% of the total, and vegetables 10%. Applications to grassland are estimated to account for 3% of the world total, but this share is likely underestimated due to information gaps for several countries. The ‘other’ category, which includes a wide range of crops (Table 2), received the remaining 6% of global fertilizer use.

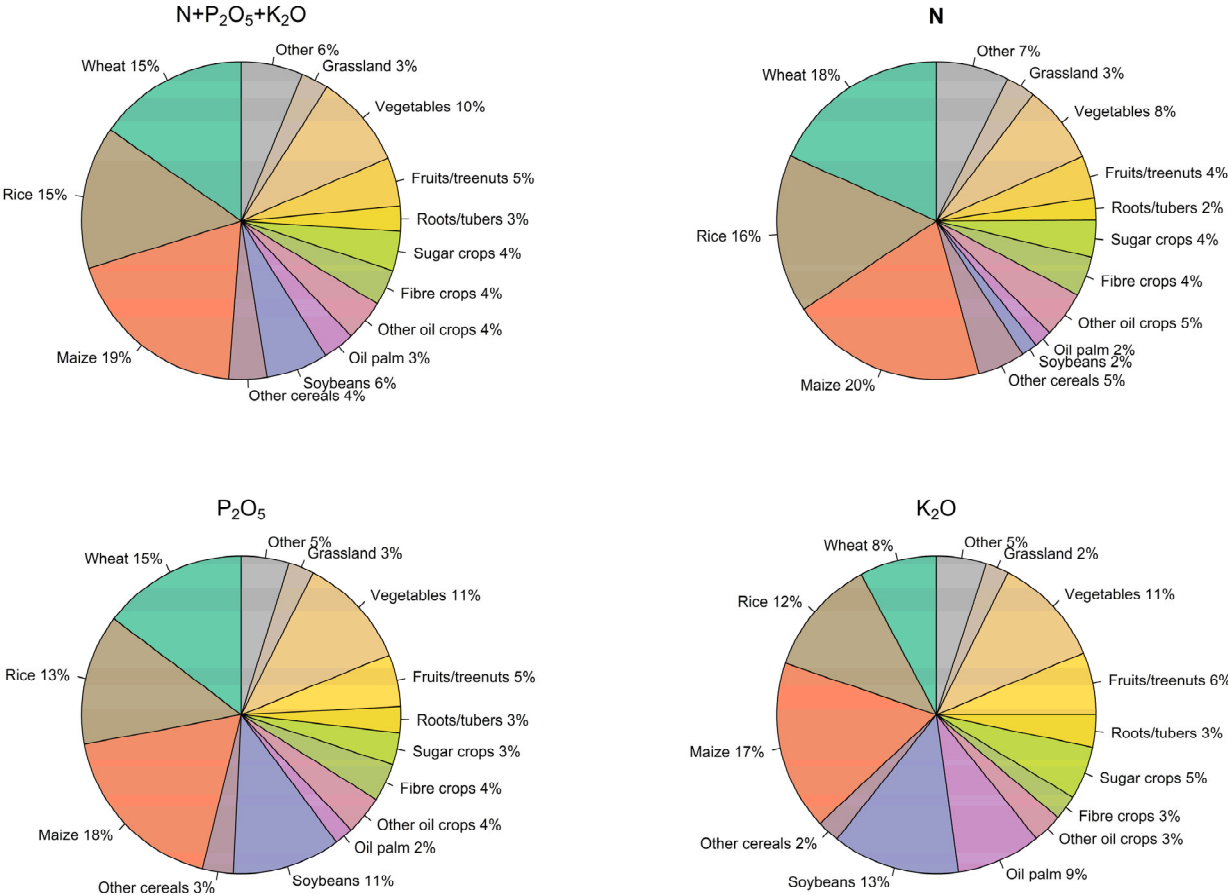
Overall, the crop shares of total fertilizer consumption in 2018 were similar to those reported for 2014 (Fig. 2). Because different crops have different nutrient requirements, their contributions to N, P₂O₅ and K₂O consumption vary significantly. For example, cereals contribute significantly to N and P₂O₅ fertilizer consumption, while soybean - a leguminous crop that biologically fixes atmospheric N – contributes mostly to P₂O₅ and K₂O consumption. Crops with massive biomass such as oil palm and sugarcane contribute significantly to K₂O use. Fruits and vegetables also contribute significantly to P₂O₅ and K₂O consumption.

Nitrogen

Cereals accounted for 59% of world fertilizer N consumption in 2018 (Fig. 3, Annex 3a). Maize is the crop receiving the largest amount of N fertilizers, representing 20% of global use,

followed by wheat with 18% and rice with 16%. Other cereals accounted for 5% of the world N total. Because soybean fixes N from the atmosphere, its share of global N consumption is small (less than 2%). Other oil crops contributed modestly (7%) to world N fertilizer consumption. Rapeseed (under the 'other oilseeds' category) was the main oilseed crop receiving N fertilizers. Fibre crops (mainly cotton), sugar crops, and roots & tubers together represented another 10% of global fertilizer N use. Fruits (including tree nuts) and vegetables accounted for 12% of N consumption. The remaining 10% of global N fertilizer went to grassland and other crops.

Figure 3: Global mineral fertilizer use by crop, faceted by nutrient (FUBC 2018 survey)



Source: IFA

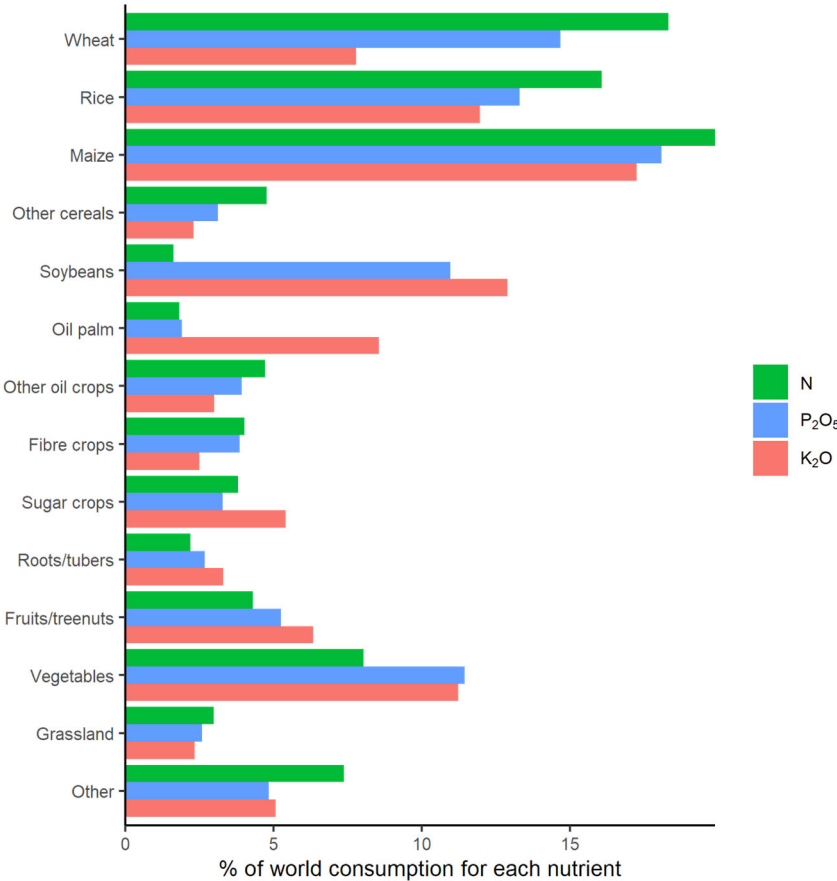
Phosphorus

In 2018 cereals received about 49% of world P₂O₅ fertilizer applications (Fig. 3), with a higher contribution of maize (18%) compared to wheat (15%), rice (13%) and other cereals (3%). The soybean share was significant too (11%); other oil crops including oil palm accounted for another 6% of global P₂O₅ consumption. Fibre crops, sugar crops, and roots & tubers received 10% of global P₂O₅ fertilizer consumption. The share of fruits and vegetables was estimated at 16%, with 5% going to fruits (including tree nuts) and 11% to vegetables. Grassland received 3% of total P₂O₅ fertilizer applications, and the other crops accounted for the use of the remaining 5%.

Potassium

The distribution of world K₂O fertilizer consumption by crop categories appears very different from that of N and P₂O₅ fertilizer consumption. High potash -consuming crops (e.g. soybean, oil palm, sugar crops, fruits, vegetables) contributed to 44% of global K₂O fertilizer use in 2018 compared to 32% of P₂O₅ use and 20% of global N use. Cereals received 39% of world K₂O consumption, with a higher contribution of maize (17%) compared to rice (12%) and wheat (8%). All the oil crops combined represented 25% of global K₂O use, with the bulk being applied to soybean (13%) and oil palm (9%). The categories fibre crops and roots & tubers represented each only 3% of global potash use compared to 5% for sugar crops. Fruits and vegetables are large K₂O fertilizer consumers, accounting for 17% of the world total. Grassland used 2% of total K₂O applications, and the remaining 5% was applied to other crops.

Figure 4: Global mineral fertilizer use by crop as a percentage of world consumption for N, P₂O₅ and K₂O (FUBC 2018 survey)



Source: IFA

The contribution of the 14 crop categories to global N, P₂O₅ and K₂O fertilizer consumption is further summarized in Figure 4, and recent trends for the four major crops are shown in Table 3. Three main conclusions emerge:

- Maize has – for the first time – become the crop accounting for the largest shares of global consumption of all three major fertilizer nutrients: N, P₂O₅ and K₂O;
- Soybean share of global fertilizer consumption continues to rise, particularly for P₂O₅ and K₂O;

- The shares of wheat and rice have remained fairly constant.

This largely reflects the increasing and universal importance of maize and soybean as globally utilized and traded feed and energy (maize) commodities. In contrast, rice is primarily grown and consumed as human food in the same country, with only about 10% traded on the world market and very little usage for energy or other purposes.

Table 3: Changes in the relative shares (%) of global fertilizer consumption for the top four fertilizer consuming crops during 2010 to 2018

Nutrient	Crop	FUBC 2010	FUBC 2014	FUBC 2018
% of global fertilizer consumption				
Nitrogen	Maize	16.8	17.8	19.9
	Wheat	18.1	18.2	18.3
	Rice	15.4	15.2	16.1
	Soybean	0.9	1.1	1.6
Phosphorus	Maize	15.2	13.9	18.1
	Wheat	16.1	14.6	14.7
	Rice	12.8	12.5	13.3
	Soybean	7.9	9.7	11.0
Potassium	Maize	14.9	14.2	17.3
	Wheat	6.2	7.4	7.8
	Rice	12.6	11	12.0
	Soybean	9	12.3	12.9

Source: IFA

This shift in crop shares of global fertilizer consumption primarily reflects the changes in global crop area during the past decade. Compared to 2010, world maize area in 2018 grew by about 30 Million ha (18%) and soybean area grew by nearly 22 Million ha (21%). In contrast, rice area only increased by 5 Million ha (3%), whereas the global wheat area remained more or less unchanged (with substantial annual fluctuations).⁸

Another trend since 2010 is an apparent increase of vegetables' share of global P and K consumption, from 9.4% to 11.4% for P₂O₅ and 10.0% to 11.2% for K₂O, which could, however, have also resulted from changes in the methodology. In the past, we might have overestimated applications to fruits and underestimated applications to vegetables.

Table 4 summarizes the relative contribution of different crop categories to total fertilizer consumption by world regions, whereas Table 5 provides a summary for the world's top fertilizer-consuming countries. Annex 4 provides the crop share data for each country covered in FUBC 2018.

⁸ FAO

Table 4: Relative contribution (%) of different crop categories to total fertilizer consumption (N+P2O5+K2O) in the IFA regions (FUBC 2018 survey)

Region	Crops														
	All crops	Wheat	Rice	Maize	Other cereals	Soybeans	Oil palm	Other oil crops	Fibre crops	Sugar crops	Roots and tubers	Fruits/tree nuts	Vegetables	Grassland	Other
Africa	2	2	1	3	4	0	0	2	3	3	4	4	1	1	2
East Asia	41	32	54	42	0	10	99	21	26	25	62	50	83	2	23
EECA	4	8	0	3	12	2	0	13	0	6	1	0	0	5	5
Latin America	11	4	2	13	5	63	1	1	13	28	6	10	3	11	15
North America	12	11	1	28	14	20	0	19	12	3	7	3	2	4	24
Oceania	2	2	0	0	6	0	0	3	2	2	0	1	0	22	3
South Asia	18	23	41	5	19	6	0	18	41	27	7	11	6	0	21
West Asia	2	4	0	1	5	0	0	1	3	1	4	9	1	4	1
WCE	9	15	0	6	36	0	0	22	0	6	10	11	3	51	6
World	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* Eastern Europe and Central Asia, ** Western and Central Europe.

Source: IFA

Table 5: Relative contribution (%) of different crop categories to total fertilizer consumption (N+P2O5+K2O) in the top five fertilizer markets (FUBC 2018 survey)

Region	Crops														
	All crops	Wheat	Rice	Maize	Other cereals	Soybeans	Oil palm	Other oil crops	Fibre crops	Sugar crops	Roots and tubers	Fruits/tree nuts	Vegetables	Grassland	Other
China	32	32	34	38	0	9	0	19	25	17	48	44	79	0	17
India	14	16	34	4	17	6	0	17	34	22	2	7	4	0	19
USA	10	7	1	27	7	19	0	2	12	2	5	3	2	0	23
Europe-28*	9	15	0	6	36	0	0	22	0	5	10	11	3	50	6
Brazil	8	1	1	7	1	58	0	0	12	25	2	4	2	5	12
ROW**	27	30	30	18	39	8	100	40	17	29	33	31	10	45	24
World	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Europe-28 includes countries from the EU-27 member states (as of 2022), plus the United Kingdom.

**Rest of the world.

Source: IFA

Fertilizer Applications Rates

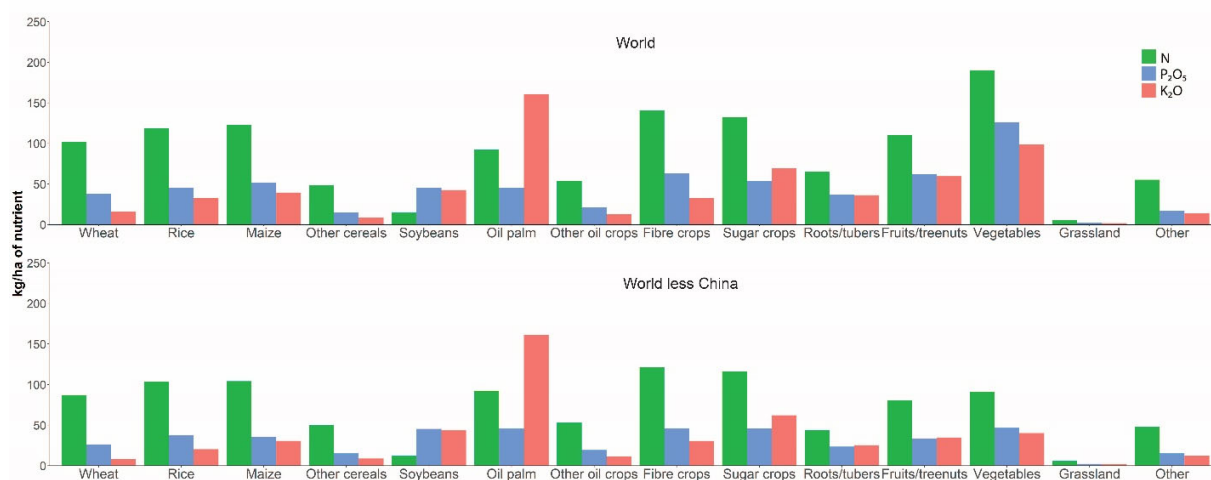
Estimated fertilizer application rates (kg nutrients/ha) by country, nutrient and crop are provided in Annex 5.

On average, in 2018, farmers across the globe applied about 113 kg nutrients/ha/year to cropland and grassland, including 61 kg N, 29 kg P₂O₅ and 23 kg K₂O (Annex 5). However, this average value masks a huge amount of variation among crops and countries. Including China, world average application rates of N+P₂O₅+K₂O followed the order vegetables (415 kg/ha) > oil palm (298 kg/ha) > sugar crops (255 kg/ha) > fibre crops (236 kg/ha) > fruits/tree nuts (232 kg/ha) > maize (214 kg/ha) > rice (198 kg/ha) > wheat (156 kg/ha) > roots & tubers (138 kg/ha) > soybean (103 kg/ha). Very little fertilizer was applied to grassland (10 kg/ha).

Due to its 32% global market share (Table 5) and an intensive agriculture with very high fertilizer rates, China has a significant impact on the global estimates of average fertilizer rates (Fig. 5; Annex 5), particularly for crops such as fruits/tree nuts and vegetables, but also cereals. For example, whereas global average nutrient application rates were 156 kg/ha for wheat, 198 kg/ha for rice and 214 kg/ha for maize, the estimates for China were 411 kg/ha, 338 kg/ha and 372 kg/ha, respectively. Even more drastic are the differences for fruits (232 kg/ha global vs 832 kg/ha in China) and vegetables (415 kg/ha global vs 634 kg/ha in China). This also raises questions about the validity of the underlying data for China, which we were not able to resolve (see section on China in Methodology). We therefore advise caution when using the global average rates presented in this report.

Average rates for the World less China are also made available in this report (Fig. 5; Annex 5). They suggest significantly lower rates of fertilizer application for many crops, but in particular for vegetables and fruits (including tree nuts).

Figure 5: Mean application rates of N, P₂O₅ and K₂O fertilizer by crops, shown separately for the world with and without China (FUBC 2018 survey)



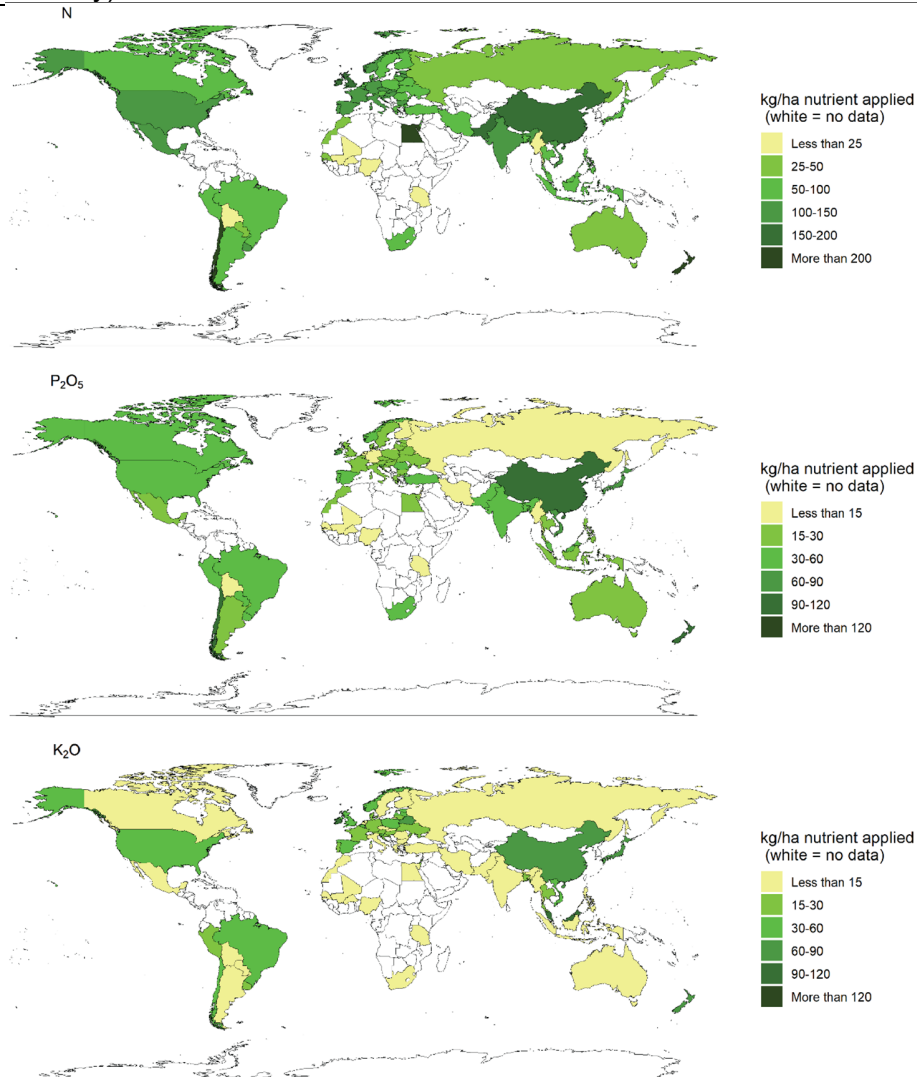
Source: IFA

Global average N application rates followed the descending order vegetables (190 kg/ha) > fibre crops (141 kg/ha) > sugar crops (132 kg/ha) > maize (123 kg/ha) > rice (118 kg/ha) > fruits/tree nuts (110 kg/ha) > wheat (102 kg/ha) > oil palm (92 kg/ha) > roots/tubers (65 kg/ha).

The highest P₂O₅ application rates followed the order vegetables (126 kg/ha) > fruits/tree nuts, fibre crops (63 kg/ha) > sugar crops, maize (52-53 kg/ha) > rice, soybean, oil palm (45-46 kg/ha) > roots/tubers, wheat (37-38 kg/ha).

For K₂O, the order was oil palm (161 kg/ha) > vegetables (99 kg/ha) > sugar crops (70 kg/ha) > fruits/tree nuts (60 kg/ha) > soybean (43 kg/ha) > maize (39 kg/ha) > roots/tubers (36 kg/ha) > fibre crops, rice (33 kg/ha) > wheat (16 kg/ha). These average rates suggest that for many crops grown worldwide the amount of potassium removed from the field with harvested products and crop residues significantly exceeds the amount supplied through mineral fertilizers.

Figure 6: Global distribution of mean N, P₂O₅, and K₂O fertilizer application rates on cereal crops (FUBC 2018 survey)

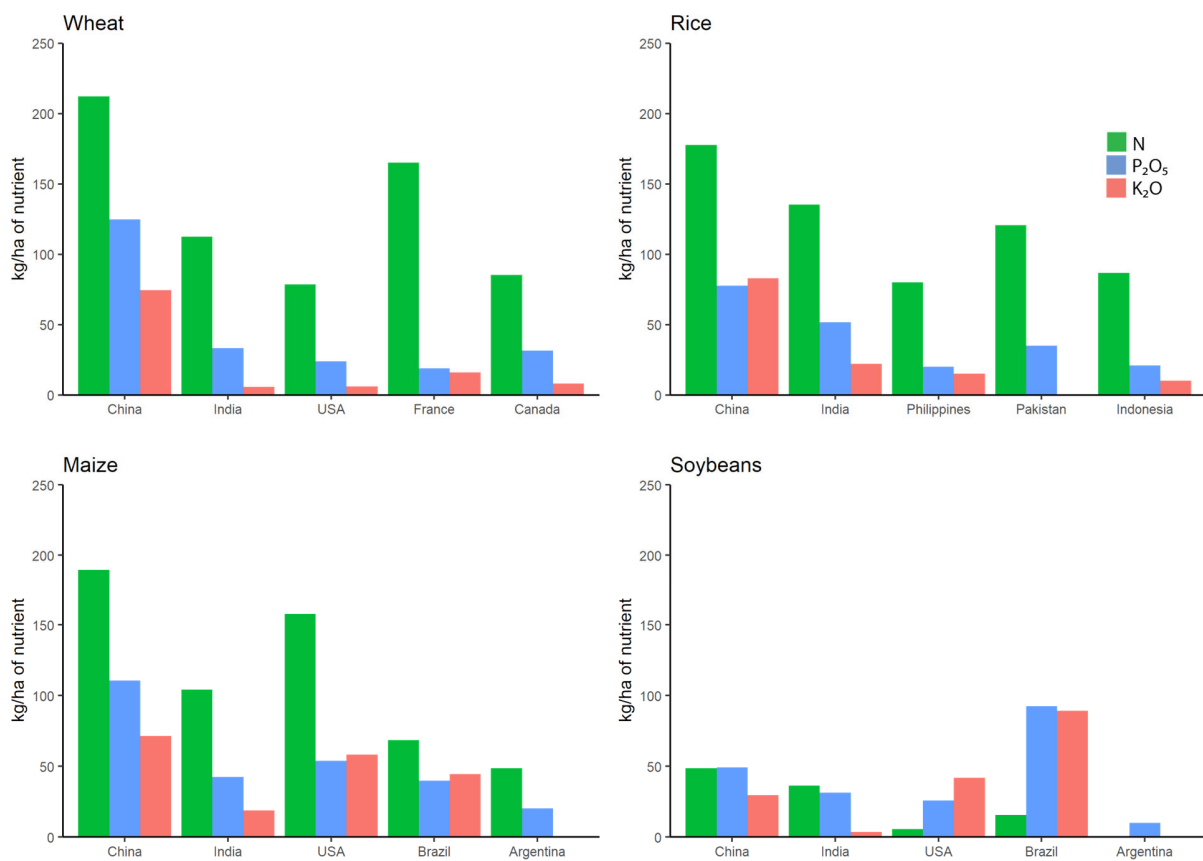


Source: IFA

In general, the average world rates were strongly affected by China and the uncertainty we have about those estimates. For comparison, Annex 5a also shows global average application rates for the world less China.

Global maps of average fertilizer applications to cereal crops illustrate a huge geographical divide (Fig. 6). Whereas N applications in much of North and South America, Western and Central Europe and Asia are at levels of about 50 to 200 kg/ha, lower rates are common in, for example, Russia, Australia and most of Africa.⁹ On the other hand, Egypt, for example has the highest N application rates globally because agriculture there is 100% irrigated. The geographical differences are even larger for P₂O₅ and K₂O applications rates (Fig. 6), indicating more widespread net removal of these nutrients from soils, particularly K₂O.

Figure 7: Mean N, P₂O₅, and K₂O fertilizer application rates in selected crops and countries for wheat, rice, maize, and soybeans



Source: IFA

Significant variations appear in the average applications rates among countries (Fig. 7), which mainly reflect different soils, agroclimatic conditions, yield levels, access to technology, levels of

⁹ The maps shown in Fig. 6 illustrate the level of average fertilizer application rates on cereal crops by using a darker color for higher average rates and a lighter color for lower average rates. No inference can be made from the differences in the size of colored areas, which only reflect the country sizes.

livestock manure recycling, and impacts of agricultural policies. In China, for example, most rice, wheat and maize crops are grown under high-yielding, intensive, irrigated conditions, land is scarce and food security is a major concern, resulting in very high N, P₂O₅ and K₂O application rates to maximize crop yields. In contrast, in Canada or the USA, much of the wheat is grown under more extensive, rainfed (dryland) conditions with lower attainable yield potential and thus also lower fertilizer amounts applied.

Brazil stands out in terms of its high P₂O₅ and K₂O application rates on soybean, which primarily reflects soils that are highly deficient in these nutrients. In contrast, in Argentina, soybean is grown on more fertile soils, resulting in P₂O₅ and K₂O rates that are much lower. However, there is a risk that this, over time, may also lead to unsustainable soil nutrient depletion. Generally speaking, the fertilizer rates shown in Fig. 7 also suggest that many of the world's leading grain producing countries currently operate under conditions at which a balanced N:P₂O₅:K₂O crop nutrition is not achieved.

Outlook

This report illustrates how difficult it is to obtain accurate and timely estimates of fertilizer use, disaggregated by crops within countries. Such basic information is needed for many purposes, but there is at present no consistent, robust methodology for obtaining more accurate data on a regular basis and with high quality in every country. Expert surveys such as the one conducted in our study does not allow a high level of spatial resolution or good accuracy of the estimates. No single institution in the world has all the resources needed to make significant improvements in such agronomic data collection. Collective action is therefore required in order to fill this critical data gap. We propose the following for further consideration:

- Agricultural sectors, institutions and available data sources differ widely among countries. Therefore, following a common framework methodology, a dedicated data collection and processing pipeline needs to be designed for every country, with appropriate quality controls and allowing aggregation at national, regional and global levels.
- At the country level, this requires collaboration between the government (statistical offices), the research sector, the private sector and farmer organizations in order to tap all available data sources (including access to fertilizer retail and farm/field data). At the international level, organizations such as IFA and FAO could jointly coordinate the development of the necessary methodologies, provide training and manage the resulting database on behalf of the global community.
- Maximum use should be made of geospatial methodologies for optimized data collection based on the predominant agro-climatic growing zones. Such a stratification will allow optimizing data collection and minimizing costs.
- The private sector as well as numerous other organizations engaged in research and development collect large amounts of data for their own use, including information on fertilizer use. At present, little of that information is shared publicly, or it is not easily findable and usable. A mechanism for securely and easily sharing such information needs to be created so that more of this data can feed into assessments of FUBC or be used for

other aggregated purposes, such as quantification of nutrient balances and nutrient use efficiency at national to global scales, or by crops in a country.

- New digital and social approaches should be tried for collecting and validating farm-level information. In particular, available farm household survey databases should be tapped and approaches such as crowd sourcing through social media should be tried.
- Besides regularly collecting data on fertilizer use (by crops), the same mechanisms should be used to simultaneously collect other much-needed information, including use of different fertilizer products, use of livestock manure and other organic fertilizers, crop residue management and farm gate prices.

At IFA, we have begun to work in this direction, including conducting pilot projects on better data collection and creating publicly available nutrient-related databases. We invite others to join us in these efforts.

Annex 2: Estimates of Total Fertilizer Use by Crop Category at the Global Level

Crop category	FUBC 2018 Mean nutrient application rate (kg N+P ₂ O ₅ +K ₂ O/ha)	FUBC 2018 Share of total consumption of N+P ₂ O ₅ +K ₂ O (%)	FUBC 2014 Share of total consumption of N+P ₂ O ₅ +K ₂ O (%)	Change in share of consumption (FUBC 2018 - FUBC 2014) (%)
Wheat	156	15	15	0
Rice	197	15	14	1
Maize	214	19	16	3
Other cereals	72	4	4	0
Soybeans	103	6	5	1
Oil palm	298	3	3	1
Other oil crops	88	4	5	0
Fibre crops	236	4	4	0
Sugar crops	255	4	4	0
Roots/tubers	138	3	2	0
Fruits/tree nuts	232	5	7	-2
Vegetables	415	10	9	1
Grassland	10	3	4	-2
Other	86	6	8	-2
Total	113	100	100	0

Source: IFA

Annex 3a: Estimates of Fertilizer Use by Nutrient and Crop Category at the Global Level: Nitrogen

Crop category	FUBC 2018 Mean application rate (kg N/ha)	FUBC 2018 Share of total consumption (%)	FUBC 2014 Share of total consumption (%)	Change in share of consumption (FUBC 2018 - FUBC 2014) (%)
Wheat	102	18	18	0
Rice	118	16	15	1
Maize	123	20	18	2
Other cereals	48	5	5	0
Soybeans	15	2	1	1
Oil palm	92	2	1	0
Other oil crops	54	5	5	-1
Fibre crops	141	4	4	0
Sugar crops	132	4	4	0
Roots/tubers	65	2	2	0
Fruits/tree nuts	110	4	6	-2
Vegetables	190	8	7	1
Grassland	6	3	5	-2
Other	55	7	8	-1
Total	61	100	100	0

Source: IFA

Annex 3b: Estimates of Fertilizer Use by Nutrient and Crop Category at the Global Level: Phosphorus

Crop category	FUBC 2018 Mean application rate (kg P ₂ O ₅ /ha)	FUBC 2018 Share of total consumption (%)	FUBC 2014 Share of total consumption (%)	Change in share of consumption (FUBC 2018 - FUBC 2014) (%)
Wheat	38	15	15	0
Rice	46	13	13	1
Maize	52	18	14	4
Other cereals	15	3	4	0
Soybeans	46	11	10	1
Oil palm	45	2	2	0
Other oil crops	21	4	5	-1
Fibre crops	63	4	4	0
Sugar crops	53	3	4	0
Roots/tubers	37	3	3	0
Fruits/tree nuts	63	5	9	-4
Vegetables	126	11	10	2
Grassland	2	3	4	-1
Other	17	5	7	-2
Total	29	100	100	0

Source: IFA

Annex 3c: Estimates of Fertilizer Use by Nutrient and Crop Category at the Global Level: Potassium

Crop category	FUBC 2018 Mean application rate (kg K ₂ O/ha)	FUBC 2018 Share of total consumption (%)	FUBC 2014 Share of total consumption (%)	Change in share of consumption (FUBC 2018 - FUBC 2014) (%)
Wheat	16	8	7	0
Rice	33	12	11	1
Maize	39	17	14	3
Other cereals	9	2	3	0
Soybeans	43	13	12	1
Oil palm	161	9	8	1
Other oil crops	13	3	3	0
Fibre crops	33	3	2	0
Sugar crops	70	5	6	-1
Roots/tubers	36	3	3	1
Fruits/tree nuts	60	6	9	-2
Vegetables	99	11	11	1
Grassland	2	2	4	-1
Other	14	5	8	-3
Total	23	100	100	0

Source: IFA

Annex 4: Estimates of Fertilizer Use Share (%) by Geography, Nutrient and Crop Category

Countries are listed in descending order based on their total annual fertilizer consumption.

4A		Cereals				Oil crops			Fruit/treenuts/veges							
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
World	N	18	16	20	5	2	2	5	4	4	2	4	8	3	7	100
	P2O5	15	13	18	3	11	2	4	4	3	3	5	11	3	5	100
	K2O	8	12	17	2	13	9	3	3	5	3	6	11	2	5	100
	N+P2O5+K2O	15	15	19	4	6	3	4	4	4	3	5	10	3	6	100
World less China	N	19	16	19	7	2	3	6	4	4	2	4	3	4	9	100
	P2O5	14	14	15	5	16	3	5	4	4	2	4	3	4	7	100
	K2O	5	9	16	4	19	13	3	3	7	3	5	3	4	6	100
	N+P2O5+K2O	15	14	17	6	8	5	5	4	5	2	4	3	4	8	100
China	N	16	17	23	0	1	0	3	3	2	4	5	21	NA	4	100
	P2O5	16	12	23	0	2	0	2	4	2	4	8	26	NA	2	100
	K2O	13	17	20	0	2	0	2	1	2	4	9	26	NA	3	100
	N+P2O5+K2O	15	15	22	0	2	0	3	3	2	4	7	24	NA	3	100
India	N	20	35	5	6	2	0	5	9	5	0	2	3	NA	8	100
	P2O5	15	34	6	4	5	0	6	9	7	0	2	3	NA	9	100
	K2O	7	37	6	2	1	0	6	8	10	1	8	6	NA	7	100
	N+P2O5+K2O	18	35	5	5	3	0	5	9	6	0	3	3	NA	8	100
United States	N	13	2	50	3	1	NA	1	4	1	1	1	1	NA	21	100
	P2O5	11	1	50	3	20	NA	1	4	2	2	1	2	NA	3	100
	K2O	3	1	48	1	29	NA	1	5	1	2	2	1	NA	7	100
	N+P2O5+K2O	10	1	50	2	11	NA	1	4	1	1	2	2	NA	14	100
Brazil	N	3	3	27	0	13	NA	NA	9	20	0	3	3	3	14	100
	P2O5	1	1	13	0	63	NA	NA	4	5	1	2	2	1	7	100
	K2O	2	1	13	1	52	NA	NA	4	13	1	2	2	1	8	100
	N+P2O5+K2O	2	2	17	0	45	NA	NA	6	12	1	2	2	2	9	100
Indonesia	N	NA	28	19	NA	0	40	0	0	1	2	3	4	NA	2	100
	P2O5	NA	19	11	NA	1	56	1	0	1	1	3	4	NA	2	100
	K2O	NA	5	4	NA	0	83	0	0	1	1	2	3	NA	1	100
	N+P2O5+K2O	NA	19	12	NA	1	57	0	0	1	1	3	4	NA	2	100
Pakistan	N	40	10	9	3	0	NA	1	14	8	1	5	3	NA	7	100
	P2O5	53	9	6	2	0	NA	1	6	7	2	7	3	NA	4	100
	K2O	9	3	5	1	0	NA	1	3	20	21	26	8	NA	3	100
	N+P2O5+K2O	43	10	8	3	0	NA	1	12	8	2	6	3	NA	6	100

Where: “%” is percentage of a country's total crop nutrient use by crop, “Oth cer” = other cereals, “Other OC” =other oil crops, “R&T”=roots and tubers, “F&T”= fruits and treenuts, “Vege”= vegetables, “Grass”= grassland, and “Total” is the total percentage for crop nutrients used in a country across all crops.

4B		Cereals				Oil crops						Fruit/treenuts/veges					Total
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %	
Canada	N	33	NA	9	14	1	NA	36	NA	0	1	0	0	4	1	100	
	P2O5	28	NA	8	13	5	NA	28	NA	0	1	0	0	8	9	100	
	K2O	19	NA	22	7	13	NA	16	NA	0	6	3	2	6	5	100	
	N+P2O5+K2O	30	NA	10	13	3	NA	32	NA	0	2	1	1	5	4	100	
Russia	N	44	1	10	12	3	NA	8	NA	6	1	0	0	NA	16	100	
	P2O5	35	1	8	10	4	NA	12	NA	13	2	0	1	NA	15	100	
	K2O	22	0	9	11	4	NA	8	NA	25	4	0	1	NA	15	100	
	N+P2O5+K2O	40	1	9	11	3	NA	9	NA	10	1	0	0	NA	15	100	
France	N	39	NA	12	13	NA	NA	13	NA	2	1	1	1	18	1	100	
	P2O5	23	NA	20	10	NA	NA	17	NA	6	2	4	3	9	6	100	
	K2O	19	NA	18	8	NA	NA	16	NA	8	4	4	3	11	9	100	
	N+P2O5+K2O	34	NA	14	12	NA	NA	14	NA	4	2	2	2	16	3	100	
Vietnam	N	NA	60	11	NA	0	NA	1	0	4	2	5	7	NA	9	100	
	P2O5	NA	64	7	NA	0	NA	3	0	3	1	6	6	NA	11	100	
	K2O	NA	58	5	NA	0	NA	3	0	5	1	6	8	NA	12	100	
	N+P2O5+K2O	NA	61	9	NA	0	NA	2	0	4	2	6	7	NA	10	100	
Turkey	N	30	1	9	9	0	NA	2	8	2	6	22	4	4	3	100	
	P2O5	26	1	9	10	0	NA	3	7	2	5	20	4	8	5	100	
	K2O	0	3	8	0	0	NA	0	15	6	7	50	10	0	2	100	
	N+P2O5+K2O	28	1	9	9	0	NA	2	8	2	6	23	5	5	3	100	
Thailand	N	NA	62	3	NA	0	3	1	NA	7	15	1	0	NA	8	100	
	P2O5	NA	44	7	NA	0	9	1	NA	11	20	4	0	NA	3	100	
	K2O	NA	28	4	NA	0	17	2	NA	15	24	5	0	NA	5	100	
	N+P2O5+K2O	NA	51	4	NA	0	7	1	NA	10	18	3	0	NA	6	100	
Australia	N	34	0	1	15	0	NA	10	7	5	NA	3	NA	6	18	100	
	P2O5	28	0	1	15	0	NA	7	3	2	NA	2	NA	33	8	100	
	K2O	14	0	0	5	0	NA	7	6	19	NA	11	NA	32	6	100	
	N+P2O5+K2O	30	0	1	14	0	NA	8	5	6	NA	3	NA	20	13	100	

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

4C		Cereals				Oil crops						Fruit/treenuts/veges				
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
Bangladesh	N	1	80	3	0	NA	NA	1	0	1	4	3	4	0	3	100
	P2O5	1	59	7	0	NA	NA	3	0	1	8	7	10	0	3	100
	K2O	1	59	5	0	NA	NA	6	0	2	8	6	10	0	3	100
	N+P2O5+K2O	1	70	5	0	NA	NA	2	0	1	6	5	7	0	3	100
Mexico	N	4	1	59	2	0	1	0	1	7	1	11	6	0	8	100
	P2O5	2	1	36	1	1	2	0	2	9	1	23	11	0	10	100
	K2O	1	1	8	0	1	2	0	2	27	2	32	15	0	8	100
	N+P2O5+K2O	3	1	47	2	0	1	0	1	10	1	16	8	0	9	100
Malaysia	N	NA	13	0	NA	NA	80	NA	NA	0	0	3	2	NA	1	100
	P2O5	NA	12	0	NA	NA	77	NA	NA	0	0	6	3	NA	1	100
	K2O	NA	5	0	NA	NA	94	NA	NA	0	0	0	0	NA	1	100
	N+P2O5+K2O	NA	7	0	NA	NA	89	NA	NA	0	0	2	1	NA	1	100
Germany	N	32	NA	11	20	NA	NA	11	NA	3	2	1	2	15	3	100
	P2O5	18	NA	17	17	NA	NA	14	NA	11	7	1	3	7	5	100
	K2O	12	NA	13	9	NA	NA	23	NA	14	10	2	4	5	8	100
	N+P2O5+K2O	26	NA	12	18	NA	NA	14	NA	6	4	1	2	12	5	100
Ukraine	N	34	NA	24	8	3	NA	25	NA	3	0	0	0	2	0	100
	P2O5	26	NA	18	9	6	NA	35	NA	4	0	0	0	1	0	100
	K2O	25	NA	19	9	6	NA	34	NA	5	1	0	1	1	0	100
	N+P2O5+K2O	31	NA	22	8	4	NA	28	NA	3	0	0	0	1	0	100
Poland	N	19	NA	15	20	NA	NA	11	NA	3	2	3	1	24	3	100
	P2O5	21	NA	17	21	NA	NA	11	NA	3	2	2	2	13	8	100
	K2O	18	NA	18	22	NA	NA	9	NA	3	2	3	1	17	7	100
	N+P2O5+K2O	19	NA	16	21	NA	NA	10	NA	3	2	3	1	20	5	100
Spain	N	22	NA	7	32	NA	NA	2	NA	1	1	27	7	1	2	100
	P2O5	20	NA	7	26	NA	NA	1	NA	1	1	28	7	1	8	100
	K2O	22	NA	6	26	NA	NA	1	NA	1	1	27	8	1	6	100
	N+P2O5+K2O	22	NA	7	29	NA	NA	1	NA	1	1	27	7	1	4	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

4D		Cereals				Oil crops						Fruit/treenuts/veges				
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
Argentina	N	36	1	38	8	0	NA	2	NA	3	1	2	NA	7	2	100
	P2O5	27	1	27	6	25	NA	2	NA	0	1	1	NA	7	1	100
	K2O	0	17	0	0	0	NA	0	NA	0	4	17	NA	0	62	100
	N+P2O5+K2O	32	1	33	7	9	NA	2	NA	2	1	2	NA	7	3	100
Egypt	N	20	15	22	1	0	NA	3	2	7	3	10	10	NA	6	100
	P2O5	14	6	13	4	0	NA	4	2	11	8	14	15	NA	10	100
	K2O	18	0	12	4	0	NA	2	2	11	8	18	17	NA	8	100
	N+P2O5+K2O	19	13	20	2	0	NA	3	2	8	4	11	12	NA	7	100
United Kingdom	N	33	NA	1	15	NA	NA	11	NA	1	2	0	1	34	1	100
	P2O5	26	NA	4	21	NA	NA	9	NA	1	8	0	3	25	3	100
	K2O	23	NA	1	20	NA	NA	7	NA	2	11	1	4	27	3	100
	N+P2O5+K2O	30	NA	2	17	NA	NA	10	NA	1	4	0	1	32	1	100
Iran	N	34	6	2	11	0	NA	3	1	4	3	21	5	6	4	100
	P2O5	38	5	2	9	1	NA	7	1	5	4	17	4	5	3	100
	K2O	14	3	1	4	1	NA	11	1	9	5	36	8	4	2	100
	N+P2O5+K2O	34	6	2	10	0	NA	4	1	4	3	21	5	6	3	100
Japan	N	8	23	3	2	1	NA	NA	NA	4	6	8	13	18	13	100
	P2O5	8	30	5	3	6	NA	NA	NA	3	9	5	15	6	11	100
	K2O	6	36	3	3	3	NA	NA	NA	3	8	6	15	5	12	100
	N+P2O5+K2O	7	29	4	3	3	NA	NA	NA	3	7	7	14	10	12	100
Romania	N	27	NA	36	8	NA	NA	20	NA	1	5	0	3	0	1	100
	P2O5	31	NA	31	8	NA	NA	18	NA	1	9	0	1	0	1	100
	K2O	23	NA	20	8	NA	NA	16	NA	3	27	0	3	0	1	100
	N+P2O5+K2O	27	NA	33	8	NA	NA	19	NA	1	8	0	2	0	1	100
Philippines	N	NA	62	17	NA	NA	1	1	NA	12	0	5	2	NA	0	100
	P2O5	NA	52	15	NA	NA	0	0	NA	12	1	17	2	NA	0	100
	K2O	NA	47	15	NA	NA	2	0	NA	15	0	16	4	NA	1	100
	N+P2O5+K2O	NA	57	16	NA	NA	1	1	NA	12	0	9	2	NA	0	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" =other oil crops, "R&T"=roots and tubers, "F&T"= fruits and treenuts, "Vege"= vegetables, "Grass"= grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

4E		Cereals				Oil crops						Fruit/treenuts/veges				
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
Belarus	N	16	NA	23	24	NA	NA	11	0	4	1	0	0	20	2	100
	P2O5	17	NA	22	26	NA	NA	11	3	7	1	0	0	9	4	100
	K2O	14	NA	21	24	NA	NA	8	1	5	1	0	0	21	3	100
	N+P2O5+K2O	15	NA	22	24	NA	NA	10	1	5	1	0	0	19	3	100
Italy	N	33	NA	21	9	NA	NA	3	NA	1	1	21	7	2	2	100
	P2O5	34	NA	11	7	NA	NA	2	NA	2	2	17	17	2	7	100
	K2O	3	NA	18	13	NA	NA	1	NA	2	4	28	26	1	4	100
	N+P2O5+K2O	29	NA	19	9	NA	NA	3	NA	1	1	21	11	2	3	100
New Zealand	N	NA	NA	NA	9	NA	NA	NA	NA	NA	NA	1	2	88	1	100
	P2O5	NA	NA	NA	6	NA	NA	NA	NA	NA	NA	1	2	90	1	100
	K2O	NA	NA	NA	8	NA	NA	NA	NA	NA	NA	3	4	84	1	100
	N+P2O5+K2O	NA	NA	NA	8	NA	NA	NA	NA	NA	NA	1	2	88	1	100
South Africa	N	4	NA	61	1	2	NA	3	0	9	2	7	4	6	0	100
	P2O5	8	NA	42	2	5	NA	6	0	9	3	8	6	10	1	100
	K2O	2	NA	18	1	5	NA	2	0	36	5	18	9	5	0	100
	N+P2O5+K2O	5	NA	47	1	4	NA	4	0	14	3	9	6	7	0	100
Ireland	N	3	NA	1	8	NA	NA	0	NA	NA	0	NA	0	87	1	100
	P2O5	3	NA	1	12	NA	NA	0	NA	NA	2	NA	0	79	1	100
	K2O	4	NA	1	14	NA	NA	0	NA	NA	1	NA	0	77	2	100
	N+P2O5+K2O	3	NA	1	10	NA	NA	0	NA	NA	1	NA	0	84	1	100
Hungary	N	29	NA	32	7	NA	NA	24	NA	0	0	3	2	0	2	100
	P2O5	30	NA	27	8	NA	NA	29	NA	0	0	1	2	0	2	100
	K2O	16	NA	38	7	NA	NA	32	NA	1	0	0	4	0	2	100
	N+P2O5+K2O	27	NA	32	7	NA	NA	26	NA	0	0	3	2	0	2	100
Nigeria	N	NA	9	16	30	4	NA	11	2	NA	16	NA	NA	NA	12	100
	P2O5	NA	9	15	29	4	NA	11	2	NA	18	NA	NA	NA	13	100
	K2O	NA	9	15	30	4	NA	11	2	NA	17	NA	NA	NA	11	100
	N+P2O5+K2O	NA	9	15	30	4	NA	11	2	NA	17	NA	NA	NA	12	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" =other oil crops, "R&T"=roots and tubers, "F&T"= fruits and treenuts, "Vege"= vegetables, "Grass"= grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

4F		Cereals				Oil crops						Fruit/treenuts/veges				
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
Chile	N	22	1	14	10	NA	NA	3	NA	1	3	18	5	22	NA	100
	P2O5	16	1	9	14	NA	NA	3	NA	2	6	6	7	35	NA	100
	K2O	5	0	12	7	NA	NA	1	NA	2	6	31	7	27	NA	100
	N+P2O5+K2O	17	1	12	11	NA	NA	3	NA	2	5	18	6	27	NA	100
Paraguay	N	11	8	39	3	8	NA	2	0	9	0	2	0	17	NA	100
	P2O5	10	4	17	2	58	NA	2	0	1	0	1	0	6	NA	100
	K2O	3	1	9	0	66	NA	4	0	3	0	1	0	13	NA	100
	N+P2O5+K2O	8	4	18	1	52	NA	2	0	3	0	1	0	10	NA	100
Peru	N	NA	22	14	9	NA	4	NA	0	5	20	9	8	NA	8	100
	P2O5	NA	24	13	7	NA	3	NA	0	0	23	11	7	NA	12	100
	K2O	NA	13	10	8	NA	3	NA	0	0	30	14	11	NA	11	100
	N+P2O5+K2O	NA	21	13	9	NA	4	NA	0	3	23	11	8	NA	10	100
Myanmar (Burma)	N	1	74	5	0	1	1	1	1	3	0	2	5	NA	6	100
	P2O5	0	55	5	0	2	1	1	1	3	0	1	3	NA	28	100
	K2O	0	54	5	0	2	1	0	1	9	0	2	8	NA	17	100
	N+P2O5+K2O	0	62	5	0	1	1	1	1	5	0	2	6	NA	15	100
Bulgaria	N	43	NA	17	4	NA	NA	27	NA	NA	1	4	2	0	2	100
	P2O5	40	NA	10	3	NA	NA	25	NA	NA	2	6	4	0	10	100
	K2O	26	NA	16	2	NA	NA	36	NA	NA	3	9	6	0	2	100
	N+P2O5+K2O	41	NA	16	4	NA	NA	27	NA	NA	1	5	3	0	4	100
Czechia	N	39	NA	15	11	NA	NA	21	NA	3	1	2	1	2	6	100
	P2O5	35	NA	16	13	NA	NA	24	NA	4	1	4	2	1	1	100
	K2O	25	NA	14	10	NA	NA	20	NA	7	2	15	3	1	3	100
	N+P2O5+K2O	37	NA	15	11	NA	NA	21	NA	3	1	3	1	2	5	100
Morocco	N	37	0	2	11	NA	NA	4	NA	5	3	21	9	NA	8	100
	P2O5	35	0	2	9	NA	NA	5	NA	4	3	21	10	NA	10	100
	K2O	14	0	1	3	NA	NA	3	NA	6	5	52	15	NA	2	100
	N+P2O5+K2O	32	0	2	9	NA	NA	4	NA	5	3	27	11	NA	7	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

4G		Cereals				Oil crops						Fruit/treenuts/veges				
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
Denmark	N	25	NA	3	34	NA	NA	8	NA	2	3	0	1	3	20	100
	P2O5	21	NA	7	46	NA	NA	5	NA	2	3	0	2	1	11	100
	K2O	22	NA	3	38	NA	NA	6	NA	3	5	1	1	2	20	100
	N+P2O5+K2O	24	NA	4	36	NA	NA	7	NA	2	4	0	2	2	19	100
Uruguay	N	22	11	14	27	2	NA	5	NA	1	0	1	1	12	4	100
	P2O5	6	5	5	9	29	NA	2	NA	0	0	1	0	22	22	100
	K2O	9	9	7	12	56	NA	4	NA	1	1	2	1	0	0	100
	N+P2O5+K2O	12	8	9	16	24	NA	3	NA	1	0	1	1	15	12	100
Lithuania	N	43	NA	2	20	NA	NA	12	NA	1	1	0	0	17	3	100
	P2O5	38	NA	1	21	NA	NA	10	NA	1	1	1	0	15	10	100
	K2O	33	NA	2	19	NA	NA	13	NA	2	2	1	1	15	13	100
	N+P2O5+K2O	40	NA	2	20	NA	NA	12	NA	1	1	0	0	16	6	100
Greece	N	13	NA	16	8	NA	NA	2	NA	0	2	27	8	0	24	100
	P2O5	11	NA	6	8	NA	NA	4	NA	0	4	34	10	0	24	100
	K2O	0	NA	2	0	NA	NA	2	NA	0	6	35	23	0	32	100
	N+P2O5+K2O	10	NA	12	7	NA	NA	3	NA	0	3	30	11	0	25	100
Netherlands	N	9	NA	6	1	NA	NA	0	NA	4	11	1	3	65	0	100
	P2O5	2	NA	10	1	NA	NA	0	NA	13	60	4	10	0	1	100
	K2O	2	NA	3	1	NA	NA	0	NA	8	66	4	9	8	1	100
	N+P2O5+K2O	8	NA	5	1	NA	NA	0	NA	5	21	1	4	54	0	100
Mali	N	0	25	43	2	NA	NA	NA	24	1	NA	4	NA	NA	1	100
	P2O5	0	25	22	4	NA	NA	NA	44	1	NA	2	NA	NA	3	100
	K2O	0	3	32	5	NA	NA	NA	54	2	NA	4	NA	NA	0	100
	N+P2O5+K2O	0	21	36	3	NA	NA	NA	35	1	NA	4	NA	NA	1	100
Sweden	N	28	NA	1	27	NA	NA	8	NA	2	1	0	1	28	4	100
	P2O5	22	NA	2	36	NA	NA	11	NA	3	5	0	2	11	7	100
	K2O	16	NA	1	31	NA	NA	7	NA	3	14	0	6	13	8	100
	N+P2O5+K2O	26	NA	1	29	NA	NA	9	NA	2	4	0	1	24	5	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

4H		Cereals				Oil crops						Fruit/treenuts/veges				
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
Finland	N	10	NA	0	34	NA	NA	3	NA	1	1	0	1	44	6	100
	P2O5	8	NA	0	34	NA	NA	5	NA	2	8	1	4	28	11	100
	K2O	5	NA	0	19	NA	NA	3	NA	1	5	1	3	56	6	100
	N+P2O5+K2O	9	NA	0	31	NA	NA	3	NA	1	2	0	2	45	6	100
Latvia	N	49	NA	2	20	NA	NA	13	NA	NA	2	0	1	6	7	100
	P2O5	41	NA	2	20	NA	NA	12	NA	NA	3	0	1	5	16	100
	K2O	43	NA	2	18	NA	NA	14	NA	NA	4	0	1	4	14	100
	N+P2O5+K2O	47	NA	2	20	NA	NA	13	NA	NA	2	0	1	5	10	100
Austria	N	27	NA	26	19	NA	NA	7	NA	3	2	2	2	8	5	100
	P2O5	10	NA	41	8	NA	NA	7	NA	7	4	2	3	10	8	100
	K2O	12	NA	38	9	NA	NA	8	NA	8	5	2	3	9	7	100
	N+P2O5+K2O	21	NA	31	15	NA	NA	7	NA	5	3	2	2	8	6	100
Slovakia	N	40	NA	23	9	NA	NA	21	NA	2	1	0	1	1	3	100
	P2O5	29	NA	27	12	NA	NA	24	NA	3	1	1	2	0	3	100
	K2O	33	NA	19	11	NA	NA	21	NA	6	4	1	3	0	3	100
	N+P2O5+K2O	38	NA	23	9	NA	NA	21	NA	2	1	0	1	0	3	100
Burkina Faso	N	NA	4	40	5	NA	NA	NA	50	0	NA	1	NA	NA	1	100
	P2O5	NA	3	37	8	NA	NA	NA	51	0	NA	1	NA	NA	1	100
	K2O	NA	2	29	7	NA	NA	NA	59	1	NA	1	NA	NA	1	100
	N+P2O5+K2O	NA	3	36	6	NA	NA	NA	52	1	NA	1	NA	NA	1	100
Belgium	N	37	NA	13	11	NA	NA	3	NA	8	15	1	9	0	2	100
	P2O5	9	NA	27	4	NA	NA	5	NA	12	11	3	13	14	3	100
	K2O	8	NA	15	5	NA	NA	4	NA	13	21	2	6	24	2	100
	N+P2O5+K2O	23	NA	16	8	NA	NA	4	NA	10	17	2	8	10	2	100
Norway	N	9	NA	NA	21	NA	NA	0	NA	NA	1	NA	1	66	2	100
	P2O5	13	NA	NA	33	NA	NA	0	NA	NA	4	NA	3	46	0	100
	K2O	7	NA	NA	17	NA	NA	0	NA	NA	4	NA	3	69	0	100
	N+P2O5+K2O	9	NA	NA	21	NA	NA	0	NA	NA	2	NA	2	64	1	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

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		Cereals				Oil crops						Fruit/treenuts/veges				Total
Region/country	Nutrient	Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %	Other %	Total %
Croatia	N	20	NA	36	9	NA	NA	6	NA	3	1	3	0	19	3	100
	P2O5	13	NA	21	6	NA	NA	12	NA	6	3	8	1	25	3	100
	K2O	12	NA	19	7	NA	NA	9	NA	7	3	8	2	30	4	100
	N+P2O5+K2O	18	NA	30	8	NA	NA	8	NA	4	2	5	1	22	3	100
Portugal	N	3	NA	34	12	NA	NA	0	NA	NA	4	22	14	5	7	100
	P2O5	2	NA	22	11	NA	NA	0	NA	NA	5	29	15	5	10	100
	K2O	1	NA	27	1	NA	NA	0	NA	NA	4	30	17	9	10	100
	N+P2O5+K2O	2	NA	29	9	NA	NA	0	NA	NA	4	25	15	6	8	100
Tanzania	N	NA	14	70	0	NA	NA	NA	NA	1	3	NA	NA	NA	12	100
	P2O5	NA	21	52	5	NA	NA	NA	NA	8	6	NA	NA	NA	7	100
	K2O	NA	0	0	0	NA	NA	NA	NA	0	14	NA	NA	NA	86	100
	N+P2O5+K2O	NA	15	65	1	NA	NA	NA	NA	2	4	NA	NA	NA	13	100
Senegal	N	NA	35	12	38	NA	NA	4	2	NA	NA	NA	1	NA	9	100
	P2O5	NA	29	12	5	NA	NA	36	5	NA	NA	NA	3	NA	10	100
	K2O	NA	18	19	7	NA	NA	27	4	NA	NA	NA	7	NA	18	100
	N+P2O5+K2O	NA	31	13	25	NA	NA	15	3	NA	NA	NA	2	NA	11	100
Estonia	N	35	NA	2	31	NA	NA	15	NA	NA	1	0	1	3	13	100
	P2O5	32	NA	1	22	NA	NA	24	NA	NA	3	1	2	2	12	100
	K2O	35	NA	1	24	NA	NA	26	NA	NA	2	1	2	1	8	100
	N+P2O5+K2O	35	NA	2	28	NA	NA	18	NA	NA	1	1	1	3	11	100
Israel	N	25	NA	NA	13	NA	NA	5	NA	NA	NA	11	21	NA	25	100
	P2O5	19	NA	NA	10	NA	NA	5	NA	NA	NA	19	29	NA	17	100
	K2O	3	NA	NA	10	NA	NA	5	NA	NA	NA	17	31	NA	33	100
	N+P2O5+K2O	17	NA	NA	12	NA	NA	5	NA	NA	NA	14	25	NA	27	100
Bolivia	N	14	13	31	11	14	NA	0	0	6	0	3	2	5	0	100
	P2O5	7	3	22	1	61	NA	0	0	2	0	1	2	1	0	100
	K2O	3	3	16	0	75	NA	0	0	2	0	0	0	0	0	100
	N+P2O5+K2O	8	6	23	4	49	NA	0	0	3	0	1	2	2	0	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" =other oil crops, "R&T"=roots and tubers, "F&T"= fruits and treenuts, "Vege"= vegetables, "Grass"= grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

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Region/country	Nutrient	Cereals				Oil crops						Fruit/treenuts/veges			Total %	
		Wheat %	Rice %	Maize %	Oth cer %	Soybeans %	Oil palm %	Other OC %	Fibre %	Sugar %	R&T %	F+T %	Vege %	Grass %		Other %
Slovenia	N	13	NA	31	9	NA	NA	2	NA	NA	1	2	2	28	12	100
	P2O5	12	NA	33	11	NA	NA	2	NA	NA	2	5	3	23	9	100
	K2O	14	NA	31	11	NA	NA	3	NA	NA	3	7	5	17	8	100
	N+P2O5+K2O	13	NA	31	10	NA	NA	2	NA	NA	2	4	3	24	11	100
Cyprus	N	7	NA	NA	36	NA	NA	NA	NA	NA	7	23	4	0	23	100
	P2O5	5	NA	NA	32	NA	NA	NA	NA	NA	8	35	6	0	13	100
	K2O	4	NA	NA	22	NA	NA	NA	NA	NA	4	58	5	0	7	100
	N+P2O5+K2O	6	NA	NA	32	NA	NA	NA	NA	NA	7	34	5	0	17	100

Where: "%" is percentage of a country's total crop nutrient use by crop, "Oth cer" = other cereals, "Other OC" =other oil crops, "R&T"=roots and tubers, "F&T"= fruits and treenuts, "Vege"= vegetables, "Grass"= grassland, and "Total" is the total percentage for crop nutrients used in a country across all crops.

Annex 5: Estimates of Fertilizer Applications Rates (kg/ha) by World, Country, Nutrient and Crop Category

Countries are listed in descending order based on their total annual fertilizer consumption.

5A		Cereals							Oil crops				Fruit/treenuts/veges					
Region/country	Nutrient	All crops			Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha	Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha														
World	N	105726	100.0	61	102	118	123	48	15	92	54	141	132	65	110	190	6	55
	P2O5	49310	100.0	29	38	46	52	15	46	45	21	63	53	37	63	126	2	17
	K2O	39145	100.0	23	16	33	39	9	43	161	13	33	70	36	60	99	2	14
	N+P2O5+K2O	194181	100.0	113	156	197	214	72	103	298	88	236	255	138	232	415	10	86
World less China	N	75254	100.0	48	87	104	104	50	12	92	53	121	116	43	81	91	6	48
	P2O5	31307	100.0	20	26	38	36	15	45	45	19	46	46	23	34	47	2	15
	K2O	25683	100.0	16	8	20	31	9	44	161	11	30	62	25	35	40	2	12
	N+P2O5+K2O	132244	100.0	85	121	162	170	74	101	299	83	198	224	92	149	178	10	75
China	N	30472	28.8	191	212	178	190	0	49	0	61	294	420	147	321	282	NA	229
	P2O5	18003	36.5	113	125	78	111	0	49	0	31	198	185	88	270	200	NA	59
	K2O	13462	34.4	84	74	83	71	0	30	0	22	50	205	78	241	153	NA	61
	N+P2O5+K2O	61937	31.9	387	411	338	372	0	127	0	114	542	810	313	832	634	NA	350
India	N	17638	16.7	87	112	135	104	66	36	112	52	119	184	87	79	68	NA	32
	P2O5	6910	14.0	34	33	52	42	17	31	52	24	48	91	52	29	34	NA	15
	K2O	2680	6.8	13	6	22	19	3	4	80	10	17	55	43	43	24	NA	4
	N+P2O5+K2O	27228	14.0	135	151	209	165	86	71	244	86	184	330	181	150	126	NA	51
United States	N	11347	10.7	108	78	189	158	65	6	NA	52	82	120	256	84	201	NA	1577
	P2O5	3932	8.0	37	24	45	54	21	26	NA	22	29	72	160	16	101	NA	83
	K2O	4405	11.3	42	6	42	58	6	42	NA	11	39	42	174	52	70	NA	199
	N+P2O5+K2O	19684	10.1	187	108	276	270	92	73	NA	85	150	234	589	151	371	NA	1859
Brazil	N	4389	4.2	47	55	83	68	30	16	NA	NA	239	76	147	58	39	43	46
	P2O5	5269	10.7	56	32	36	40	27	92	NA	NA	133	20	413	38	33	16	25
	K2O	6140	15.7	65	44	37	44	46	89	NA	NA	167	66	302	57	39	35	38
	N+P2O5+K2O	15798	8.1	168	132	155	153	102	197	NA	NA	539	162	862	153	111	94	109
Indonesia	N	3594	3.4	84	NA	87	117	NA	24	101	4	18	108	69	143	139	NA	18
	P2O5	1258	2.6	29	NA	21	25	NA	23	49	4	11	26	18	46	45	NA	7
	K2O	2273	5.8	53	NA	10	15	NA	11	131	2	4	63	16	66	52	NA	5
	N+P2O5+K2O	7126	3.7	166	NA	118	157	NA	59	281	10	33	196	103	255	235	NA	31
Pakistan	N	3351	3.2	146	154	121	207	120	50	NA	70	198	238	255	111	129	NA	77
	P2O5	1152	2.3	50	70	35	48	26	50	NA	32	30	71	132	57	57	NA	16
	K2O	54	0.1	2	1	0	2	1	7	NA	1	1	10	59	10	7	NA	1
	N+P2O5+K2O	4557	2.3	199	225	156	258	147	107	NA	103	229	319	446	177	192	NA	93

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and tree nuts, "Vege" = vegetables, "Grass" = grassland.

5B		Cereals							Oil crops			Fruit/treenuts/veges						
Region/country	Nutrient	All crops			Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha	Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha														
Canada	N	2612	2.5	60	85	NA	129	73	6	NA	105	NA	79	172	86	86	9	7
	P2O5	1138	2.3	26	32	NA	44	29	25	NA	35	NA	40	88	44	44	9	24
	K2O	421	1.1	10	8	NA	48	6	24	NA	8	NA	53	187	93	93	2	4
	N+P2O5+K2O	4172	2.1	95	125	NA	222	108	54	NA	147	NA	172	446	223	223	20	36
Russia	N	2197	2.1	36	36	108	89	20	22	NA	17	NA	128	10	4	10	NA	129
	P2O5	685	1.4	11	9	32	24	5	9	NA	8	NA	79	8	3	8	NA	38
	K2O	338	0.9	5	3	8	13	3	5	NA	3	NA	75	10	2	8	NA	19
	N+P2O5+K2O	3219	1.7	52	48	148	127	28	35	NA	28	NA	282	28	9	26	NA	186
France	N	2243	2.1	80	165	NA	91	121	NA	NA	121	NA	100	120	35	90	33	17
	P2O5	426	0.9	15	19	NA	29	18	NA	NA	30	NA	50	50	20	50	3	26
	K2O	447	1.1	16	16	NA	28	16	NA	NA	30	NA	75	85	20	55	4	44
	N+P2O5+K2O	3116	1.6	112	200	NA	148	155	NA	NA	181	NA	225	255	75	195	40	88
Vietnam	N	1602	1.5	116	NA	128	169	NA	53	NA	63	152	218	47	120	112	NA	67
	P2O5	821	1.7	59	NA	69	54	NA	58	NA	64	39	76	12	65	51	NA	40
	K2O	506	1.3	37	NA	39	27	NA	36	NA	39	24	103	11	45	39	NA	29
	N+P2O5+K2O	2928	1.5	212	NA	236	250	NA	147	NA	166	215	397	70	230	201	NA	137
Turkey	N	1924	1.8	96	80	120	170	60	30	NA	50	150	100	120	120	120	50	59
	P2O5	853	1.7	43	30	60	70	30	30	NA	30	60	60	40	50	50	50	47
	K2O	140	0.4	7	0	30	10	0	0	NA	0	20	30	10	20	20	0	3
	N+P2O5+K2O	2918	1.5	146	110	210	250	90	60	NA	80	230	190	170	190	190	100	109
Thailand	N	1540	1.5	77	NA	92	37	NA	0	55	65	NA	62	111	31	158	NA	38
	P2O5	477	1.0	24	NA	20	29	NA	43	51	59	NA	31	47	36	47	NA	4
	K2O	632	1.6	31	NA	17	25	NA	0	130	105	NA	53	73	53	47	NA	10
	N+P2O5+K2O	2650	1.4	132	NA	129	91	NA	43	236	229	NA	146	231	120	252	NA	53
Australia	N	1263	1.2	4	39	98	255	34	0	NA	39	183	143	NA	117	NA	0	107
	P2O5	957	1.9	3	25	26	96	26	0	NA	20	58	53	NA	86	NA	1	33
	K2O	273	0.7	1	3	0	0	3	0	NA	6	33	119	NA	111	NA	0	7
	N+P2O5+K2O	2493	1.3	7	67	124	351	63	0	NA	65	274	314	NA	313	NA	1	147

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland.

5C

Region/country	Nutrient	All crops			Cereals				Oil crops						Fruit/treenuts/veges		Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha	Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha		
Bangladesh	N	1321	1.2	85	47	92	106	0	NA	NA	25	40	100	104	117	83	0	68
	P2O5	681	1.4	44	26	35	118	0	NA	NA	42	25	93	113	119	113	0	38
	K2O	444	1.1	29	14	23	58	0	NA	NA	58	17	97	75	66	75	0	24
	N+P2O5+K2O	2446	1.3	158	87	149	282	0	NA	NA	125	82	290	292	303	271	0	130
Mexico	N	1500	1.4	15	113	173	123	21	0	136	19	58	125	122	112	118	0	37
	P2O5	506	1.0	5	20	89	26	3	36	116	5	37	59	66	75	82	0	15
	K2O	290	0.7	3	4	54	3	0	15	79	1	20	100	74	62	64	0	7
	N+P2O5+K2O	2296	1.2	24	137	316	153	24	51	332	24	116	285	262	249	264	0	60
Malaysia	N	495	0.5	78	NA	92	74	NA	NA	77	NA	NA	241	75	167	169	NA	27
	P2O5	237	0.5	37	NA	40	48	NA	NA	35	NA	NA	116	36	160	137	NA	13
	K2O	1431	3.7	227	NA	97	69	NA	NA	258	NA	NA	335	104	75	80	NA	44
	N+P2O5+K2O	2163	1.1	343	NA	229	191	NA	NA	370	NA	NA	692	216	402	386	NA	85
Germany	N	1522	1.4	94	150	NA	63	117	NA	NA	136	NA	125	135	40	165	49	57
	P2O5	218	0.4	13	12	NA	14	14	NA	NA	25	NA	60	60	6	50	3	12
	K2O	415	1.1	26	15	NA	22	14	NA	NA	74	NA	139	165	50	130	4	37
	N+P2O5+K2O	2156	1.1	132	177	NA	99	145	NA	NA	235	NA	324	360	96	345	57	106
Ukraine	N	1436	1.4	81	104	NA	107	61	37	NA	64	NA	170	159	30	138	38	33
	P2O5	350	0.7	20	19	NA	19	17	15	NA	22	NA	56	66	12	47	7	10
	K2O	364	0.9	20	19	NA	21	17	16	NA	22	NA	74	144	15	77	7	9
	N+P2O5+K2O	2151	1.1	121	142	NA	147	95	68	NA	108	NA	299	369	56	263	52	53
Poland	N	1179	1.1	82	91	NA	138	49	NA	NA	139	NA	170	61	90	99	90	46
	P2O5	339	0.7	24	29	NA	46	15	NA	NA	42	NA	50	20	18	32	14	33
	K2O	559	1.4	39	41	NA	79	26	NA	NA	56	NA	70	37	43	51	31	47
	N+P2O5+K2O	2077	1.1	145	161	NA	263	90	NA	NA	237	NA	290	118	151	182	135	126
Spain	N	1073	1.0	53	115	NA	161	95	NA	NA	21	NA	160	120	60	195	1	18
	P2O5	423	0.9	21	42	NA	64	31	NA	NA	7	NA	65	45	25	80	1	22
	K2O	395	1.0	19	43	NA	59	29	NA	NA	6	NA	70	60	22	85	0	17
	N+P2O5+K2O	1891	1.0	93	200	NA	283	155	NA	NA	35	NA	295	225	107	360	2	57

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland.

5D		Cereals							Oil crops			Fruit/treenuts/veges						
Region/country	Nutrient	All crops			Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha	Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha														
Argentina	N	1154	1.1	20	66	56	49	46	0	NA	13	NA	88	153	54	NA	5	9
	P2O5	681	1.4	12	29	42	20	23	10	NA	8	NA	5	139	13	NA	3	3
	K2O	47	0.1	1	0	42	0	0	0	NA	0	NA	0	24	18	NA	0	10
	N+P2O5+K2O	1882	1.0	33	96	140	69	69	10	NA	21	NA	94	316	84	NA	7	22
Egypt	N	1245	1.2	212	180	234	277	73	51	NA	172	220	242	194	181	204	NA	304
	P2O5	223	0.5	38	22	17	28	38	36	NA	46	51	68	96	44	51	NA	82
	K2O	125	0.3	21	16	0	15	23	0	NA	12	24	39	52	32	33	NA	40
	N+P2O5+K2O	1593	0.8	271	219	251	320	134	87	NA	231	294	349	343	258	288	NA	425
United Kingdom	N	1031	1.0	64	191	NA	61	114	NA	NA	186	NA	92	142	87	59	31	17
	P2O5	189	0.4	12	27	NA	34	29	NA	NA	27	NA	18	105	14	46	4	14
	K2O	263	0.7	16	33	NA	16	39	NA	NA	31	NA	50	207	75	80	6	23
	N+P2O5+K2O	1482	0.8	92	251	NA	111	182	NA	NA	243	NA	160	454	176	185	42	55
Iran	N	958	0.9	23	49	126	189	54	14	NA	91	162	185	271	175	146	2	31
	P2O5	97	0.2	2	6	12	23	5	14	NA	18	25	23	34	14	11	0	2
	K2O	31	0.1	1	1	2	4	1	6	NA	9	6	13	15	10	7	0	1
	N+P2O5+K2O	1086	0.6	26	55	140	215	59	34	NA	118	192	221	321	199	164	2	34
Japan	N	369	0.3	91	146	58	126	73	17	NA	NA	NA	184	107	154	154	84	112
	P2O5	338	0.7	83	126	69	161	86	134	NA	NA	NA	126	148	92	156	26	86
	K2O	270	0.7	67	73	66	88	75	59	NA	NA	NA	91	114	85	123	18	75
	N+P2O5+K2O	977	0.5	241	345	194	375	234	210	NA	NA	NA	401	369	331	433	127	273
Romania	N	612	0.6	47	76	NA	78	60	NA	NA	74	NA	145	150	2	65	0	36
	P2O5	267	0.5	21	38	NA	30	27	NA	NA	29	NA	83	132	1	12	0	8
	K2O	84	0.2	7	9	NA	6	8	NA	NA	8	NA	100	120	1	9	0	3
	N+P2O5+K2O	964	0.5	74	123	NA	114	94	NA	NA	111	NA	328	402	4	86	0	47
Philippines	N	622	0.6	48	NA	80	42	NA	NA	59	2	NA	166	8	38	49	NA	12
	P2O5	185	0.4	14	NA	20	11	NA	NA	14	0	NA	52	3	38	17	NA	5
	K2O	153	0.4	12	NA	15	9	NA	NA	54	0	NA	51	2	29	23	NA	11
	N+P2O5+K2O	961	0.5	74	NA	115	63	NA	NA	128	2	NA	269	14	105	89	NA	28

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland.

SE		Cereals							Oil crops			Fruit/treenuts/veges						
Region/country	Nutrient	All crops			Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha	Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha														
Belarus	N	405	0.4	53	106	NA	95	77	NA	NA	125	22	147	84	11	68	20	34
	P2O5	105	0.2	14	28	NA	24	22	NA	NA	34	56	74	57	3	34	2	18
	K2O	383	1.0	50	86	NA	83	74	NA	NA	90	102	195	134	12	102	20	62
	N+P2O5+K2O	892	0.5	116	220	NA	202	172	NA	NA	248	180	416	275	26	203	42	114
Italy	N	599	0.6	52	104	NA	166	77	NA	NA	36	NA	90	100	56	95	3	6
	P2O5	165	0.3	14	29	NA	23	17	NA	NA	5	NA	65	57	12	65	1	6
	K2O	115	0.3	10	2	NA	26	21	NA	NA	3	NA	50	90	14	68	0	2
	N+P2O5+K2O	879	0.5	76	135	NA	216	115	NA	NA	44	NA	205	247	83	228	5	15
New Zealand	N	360	0.3	31	NA	NA	NA	221	NA	NA	NA	NA	NA	NA	41	133	33	1
	P2O5	296	0.6	25	NA	NA	NA	119	NA	NA	NA	NA	NA	NA	49	103	28	1
	K2O	126	0.3	11	NA	NA	NA	68	NA	NA	NA	NA	NA	NA	59	102	11	1
	N+P2O5+K2O	782	0.4	67	NA	NA	NA	408	NA	NA	NA	NA	NA	NA	150	338	72	3
South Africa	N	381	0.4	64	30	NA	100	35	10	NA	15	36	92	170	86	170	42	17
	P2O5	249	0.5	42	38	NA	45	35	17	NA	20	22	60	160	59	159	47	28
	K2O	132	0.3	22	5	NA	10	6	8	NA	4	3	133	120	74	120	11	10
	N+P2O5+K2O	763	0.4	128	73	NA	155	76	35	NA	39	61	285	450	219	449	100	54
Ireland	N	408	0.4	91	200	NA	160	156	NA	NA	180	NA	NA	150	NA	60	86	80
	P2O5	105	0.2	23	63	NA	85	62	NA	NA	43	NA	NA	200	NA	100	20	52
	K2O	142	0.4	32	96	NA	110	96	NA	NA	70	NA	NA	200	NA	100	26	108
	N+P2O5+K2O	656	0.3	146	359	NA	355	315	NA	NA	293	NA	NA	550	NA	260	132	241
Hungary	N	393	0.4	82	120	NA	120	60	NA	NA	91	NA	83	55	81	88	2	34
	P2O5	80	0.2	17	25	NA	21	15	NA	NA	23	NA	12	20	5	17	0	7
	K2O	80	0.2	17	13	NA	29	13	NA	NA	25	NA	37	22	0	48	0	6
	N+P2O5+K2O	554	0.3	116	158	NA	169	88	NA	NA	139	NA	132	97	86	153	3	47
Nigeria	N	352	0.3	6	NA	8	9	14	12	NA	11	14	NA	3	NA	NA	NA	2
	P2O5	85	0.2	1	NA	2	2	3	3	NA	3	3	NA	1	NA	NA	NA	1
	K2O	82	0.2	1	NA	2	2	3	3	NA	2	3	NA	1	NA	NA	NA	0
	N+P2O5+K2O	519	0.3	9	NA	12	13	21	17	NA	16	21	NA	5	NA	NA	NA	3

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland.

5F		Cereals							Oil crops			Fruit/treenuts/veges						
Region/country	Nutrient	All crops			Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha	Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha														
Chile	N	245	0.2	97	200	94	279	167	NA	NA	188	NA	200	156	95	163	42	NA
	P2O5	143	0.3	57	83	83	113	133	NA	NA	125	NA	167	200	19	125	38	NA
	K2O	111	0.3	44	22	20	113	53	NA	NA	38	NA	133	156	74	100	23	NA
	N+P2O5+K2O	499	0.3	199	306	198	504	353	NA	NA	350	NA	500	511	187	388	104	NA
Paraguay	N	91	0.1	14	20	40	34	20	2	NA	8	25	50	25	25	25	23	NA
	P2O5	243	0.5	37	50	50	39	30	40	NA	22	30	20	20	20	20	20	NA
	K2O	161	0.4	25	10	10	13	0	30	NA	30	30	30	30	30	30	30	NA
	N+P2O5+K2O	495	0.3	76	80	100	86	50	72	NA	60	85	100	75	75	75	73	NA
Peru	N	260	0.2	90	NA	136	136	27	NA	136	NA	109	136	109	136	163	NA	64
	P2O5	118	0.2	41	NA	69	56	9	NA	46	NA	46	0	56	69	69	NA	40
	K2O	94	0.2	33	NA	29	35	9	NA	44	NA	29	0	58	73	87	NA	29
	N+P2O5+K2O	472	0.2	164	NA	235	227	45	NA	226	NA	184	136	223	278	320	NA	133
Myanmar (Burma)	N	182	0.2	12	14	19	11	9	9	7	7	12	19	19	6	14	NA	2
	P2O5	120	0.2	8	9	9	6	5	14	7	4	3	14	18	2	6	NA	7
	K2O	163	0.4	11	6	12	10	6	24	7	1	4	49	12	7	20	NA	6
	N+P2O5+K2O	465	0.2	31	29	40	27	20	47	22	12	18	81	49	14	41	NA	16
Bulgaria	N	349	0.3	74	125	NA	128	81	NA	NA	95	NA	NA	130	90	130	0	30
	P2O5	70	0.1	15	23	NA	15	13	NA	NA	18	NA	NA	86	27	50	0	24
	K2O	37	0.1	8	8	NA	13	4	NA	NA	14	NA	NA	66	23	38	0	3
	N+P2O5+K2O	456	0.2	96	156	NA	155	99	NA	NA	126	NA	NA	282	140	218	0	57
Czechia	N	355	0.3	98	165	NA	174	91	NA	NA	172	NA	150	130	76	170	8	42
	P2O5	53	0.1	14	22	NA	27	16	NA	NA	29	NA	30	25	29	60	0	1
	K2O	34	0.1	9	10	NA	15	8	NA	NA	15	NA	35	35	64	70	0	2
	N+P2O5+K2O	441	0.2	122	197	NA	217	116	NA	NA	216	NA	215	190	170	300	9	45
Morocco	N	212	0.2	34	31	111	74	22	NA	NA	7	NA	156	92	94	136	NA	22
	P2O5	132	0.3	21	18	38	38	11	NA	NA	6	NA	84	68	60	95	NA	18
	K2O	90	0.2	14	5	20	8	2	NA	NA	3	NA	74	69	101	93	NA	3
	N+P2O5+K2O	434	0.2	69	55	169	119	36	NA	NA	16	NA	313	229	255	324	NA	44

Where: "Qt kt" = quantity in 1000 tonnes, "% world" =the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" =other oil crops, "R&T"=roots and tubers, "F&T"= fruits and treenuts, "Vege"= vegetables, "Grass"= grassland.

5G

Region/country	Nutrient	All crops				Cereals				Oil crops			Fruit/treenuts/veges			Grass kg/ha	Other kg/ha	
		Qt kt	% world	kg/ha	Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha			Vege kg/ha
Denmark	N	225	0.2	88	132	NA	40	78	NA	NA	125	NA	105	137	100	172	26	95
	P2O5	33	0.1	13	16	NA	12	15	NA	NA	12	NA	23	21	29	39	1	8
	K2O	65	0.2	25	33	NA	10	25	NA	NA	25	NA	50	68	65	50	5	28
	N+P2O5+K2O	322	0.2	126	181	NA	61	118	NA	NA	162	NA	178	226	194	261	32	130
Uruguay	N	106	0.1	25	118	82	143	143	2	NA	93	NA	143	114	76	95	7	5
	P2O5	145	0.3	34	43	45	67	67	43	NA	48	NA	57	57	57	57	18	40
	K2O	48	0.1	11	21	30	30	30	28	NA	35	NA	50	70	35	35	0	0
	N+P2O5+K2O	300	0.2	70	182	157	239	239	73	NA	176	NA	250	241	168	187	25	45
Lithuania	N	170	0.2	61	95	NA	88	68	NA	NA	99	NA	100	91	17	35	32	18
	P2O5	48	0.1	17	24	NA	18	21	NA	NA	23	NA	39	35	10	17	8	17
	K2O	60	0.2	22	26	NA	24	23	NA	NA	36	NA	72	69	14	25	10	26
	N+P2O5+K2O	278	0.1	100	145	NA	129	112	NA	NA	158	NA	211	195	41	77	50	61
Greece	N	178	0.2	27	52	NA	238	50	NA	NA	46	NA	95	165	43	220	0	53
	P2O5	50	0.1	8	13	NA	24	15	NA	NA	21	NA	30	92	15	76	0	15
	K2O	46	0.1	7	0	NA	7	1	NA	NA	10	NA	16	148	14	163	0	18
	N+P2O5+K2O	274	0.1	42	65	NA	269	66	NA	NA	77	NA	141	405	72	459	0	86
Netherlands	N	215	0.2	127	159	NA	49	56	NA	NA	130	NA	130	145	58	150	144	21
	P2O5	13	0.0	8	2	NA	5	2	NA	NA	17	NA	25	50	24	35	0	9
	K2O	36	0.1	21	5	NA	4	5	NA	NA	22	NA	40	150	65	85	3	42
	N+P2O5+K2O	264	0.1	156	166	NA	57	63	NA	NA	169	NA	195	345	147	270	147	72
Mali	N	148	0.1	19	46	48	52	1	NA	NA	NA	51	243	NA	35	NA	NA	1
	P2O5	66	0.1	9	19	21	12	1	NA	NA	NA	42	93	NA	7	NA	NA	2
	K2O	45	0.1	6	0	2	12	1	NA	NA	NA	35	141	NA	9	NA	NA	0
	N+P2O5+K2O	259	0.1	34	66	71	75	2	NA	NA	NA	127	476	NA	50	NA	NA	3
Sweden	N	170	0.2	59	125	NA	68	75	NA	NA	139	NA	95	92	25	75	31	40
	P2O5	34	0.1	12	20	NA	45	20	NA	NA	37	NA	35	75	1	45	3	14
	K2O	29	0.1	10	12	NA	15	15	NA	NA	21	NA	33	175	3	110	3	14
	N+P2O5+K2O	233	0.1	81	157	NA	128	110	NA	NA	197	NA	163	342	29	230	36	68

Where: "Qt kt" = quantity in 1000 tonnes, "% world" =the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" =other oil crops, "R&T"=roots and tubers, "F&T"= fruits and treenuts, "Vege"= vegetables, "Grass"= grassland.

5H					Cereals				Oil crops			Fruit/treenuts/veges						
Region/country	Nutrient	All crops			Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha	Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha														
Finland	N	140	0.13	67	79	NA	50	55	NA	NA	79	NA	85	65	40	80	81	50
	P2O5	22	0.04	11	10	NA	9	9	NA	NA	18	NA	55	79	31	63	8	15
	K2O	38	0.10	18	10	NA	0	9	NA	NA	18	NA	54	88	70	88	28	15
	N+P2O5+K2O	200	0.10	96	99	NA	59	72	NA	NA	115	NA	194	232	141	231	117	81
Latvia	N	116	0.11	66	135	NA	80	85	NA	NA	124	NA	NA	85	50	80	10	37
	P2O5	23	0.05	13	23	NA	16	18	NA	NA	22	NA	NA	30	10	20	2	16
	K2O	41	0.10	23	42	NA	30	27	NA	NA	45	NA	NA	70	20	30	2	25
	N+P2O5+K2O	180	0.09	102	200	NA	126	130	NA	NA	190	NA	NA	185	80	130	14	78
Austria	N	112	0.11	44	108	NA	101	74	NA	NA	49	NA	80	95	31	105	8	31
	P2O5	29	0.06	11	10	NA	41	8	NA	NA	14	NA	49	53	10	55	2	12
	K2O	35	0.09	14	15	NA	45	11	NA	NA	17	NA	63	70	13	70	3	14
	N+P2O5+K2O	176	0.09	70	133	NA	187	92	NA	NA	80	NA	192	218	54	230	12	57
Slovakia	N	128	0.12	69	123	NA	108	71	NA	NA	110	NA	112	96	16	75	2	24
	P2O5	29	0.06	16	20	NA	28	22	NA	NA	28	NA	38	45	8	45	0	5
	K2O	17	0.04	9	13	NA	11	12	NA	NA	14	NA	47	86	7	48	0	3
	N+P2O5+K2O	173	0.09	94	156	NA	148	105	NA	NA	152	NA	197	227	30	168	2	32
Burkina Faso	N	82	0.08	24	NA	17	36	3	NA	NA	NA	64	41	NA	7	NA	NA	2
	P2O5	48	0.10	14	NA	8	19	3	NA	NA	NA	38	55	NA	5	NA	NA	2
	K2O	41	0.11	12	NA	5	13	2	NA	NA	NA	38	135	NA	4	NA	NA	1
	N+P2O5+K2O	171	0.09	51	NA	31	68	8	NA	NA	NA	139	230	NA	16	NA	NA	5
Belgium	N	88	0.08	59	166	NA	50	111	NA	NA	81	NA	117	146	142	150	0	2
	P2O5	20	0.04	13	9	NA	23	9	NA	NA	30	NA	37	23	63	50	45	1
	K2O	61	0.16	41	25	NA	39	34	NA	NA	91	NA	129	136	114	73	234	1
	N+P2O5+K2O	170	0.09	112	200	NA	112	153	NA	NA	202	NA	283	305	319	273	279	4
Norway	N	101	0.10	103	120	NA	NA	100	NA	NA	100	NA	NA	100	NA	120	104	66
	P2O5	20	0.04	20	34	NA	NA	31	NA	NA	23	NA	NA	73	NA	70	14	0
	K2O	40	0.10	41	35	NA	NA	33	NA	NA	38	NA	NA	128	NA	145	43	0
	N+P2O5+K2O	161	0.08	164	189	NA	NA	164	NA	NA	161	NA	NA	301	NA	335	161	66

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland.

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Region/country	Nutrient	All crops			Cereals				Oil crops						Fruit/treenuts/veges		Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha	Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha		
Croatia	N	102	0.10	100	133	NA	145	105	NA	NA	62	NA	130	130	40	40	70	71
	P2O5	27	0.06	27	23	NA	23	20	NA	NA	32	NA	80	80	30	50	25	23
	K2O	27	0.07	26	20	NA	20	20	NA	NA	22	NA	80	80	30	60	30	30
	N+P2O5+K2O	157	0.08	152	176	NA	188	145	NA	NA	116	NA	290	290	100	150	125	123
Portugal	N	69	0.07	25	70	NA	145	70	NA	NA	16	NA	NA	128	40	90	2	21
	P2O5	31	0.06	11	25	NA	43	28	NA	NA	3	NA	NA	70	24	45	1	14
	K2O	27	0.07	10	10	NA	46	3	NA	NA	5	NA	NA	50	22	45	1	12
	N+P2O5+K2O	127	0.07	46	105	NA	235	102	NA	NA	23	NA	NA	248	86	180	4	47
Tanzania	N	91	0.09	7	NA	12	17	0	NA	NA	NA	NA	21	17	NA	NA	NA	5
	P2O5	19	0.04	2	NA	4	3	0	NA	NA	NA	NA	37	7	NA	NA	NA	1
	K2O	2	0.01	0	NA	0	0	0	NA	NA	NA	NA	0	2	NA	NA	NA	1
	N+P2O5+K2O	112	0.06	9	NA	15	19	0	NA	NA	NA	NA	58	26	NA	NA	NA	7
Senegal	N	54	0.05	15	NA	57	26	17	NA	NA	1	37	NA	NA	NA	90	NA	16
	P2O5	21	0.04	6	NA	19	10	1	NA	NA	5	46	NA	NA	NA	230	NA	6
	K2O	14	0.04	4	NA	8	10	1	NA	NA	2	28	NA	NA	NA	300	NA	8
	N+P2O5+K2O	88	0.05	24	NA	84	47	19	NA	NA	9	110	NA	NA	NA	620	NA	30
Estonia	N	55	0.05	57	125	NA	85	89	NA	NA	110	NA	NA	75	26	80	6	34
	P2O5	12	0.02	12	25	NA	15	14	NA	NA	40	NA	NA	70	21	60	1	7
	K2O	20	0.05	20	45	NA	20	24	NA	NA	70	NA	NA	90	17	90	1	8
	N+P2O5+K2O	87	0.04	90	195	NA	120	126	NA	NA	220	NA	NA	235	64	230	7	48
Israel	N	48	0.05	138	60	NA	NA	200	NA	NA	83	NA	NA	NA	250	270	NA	209
	P2O5	10	0.02	30	10	NA	NA	33	NA	NA	17	NA	NA	NA	100	81	NA	31
	K2O	29	0.07	84	5	NA	NA	100	NA	NA	47	NA	NA	NA	250	243	NA	166
	N+P2O5+K2O	87	0.04	252	75	NA	NA	333	NA	NA	147	NA	NA	NA	600	595	NA	405
Bolivia	N	19	0.02	3	13	14	13	4	2	NA	0	0	7	0	4	2	0	0
	P2O5	19	0.04	3	6	3	9	0	9	NA	0	0	3	0	1	2	0	0
	K2O	18	0.04	3	3	4	6	0	10	NA	0	0	2	0	0	0	0	0
	N+P2O5+K2O	56	0.03	9	22	21	28	4	21	NA	0	0	11	0	5	5	1	0

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland.

5J

Region/country	Nutrient	All crops			Cereals				Oil crops						Fruit/treenuts/veges		Grass kg/ha	Other kg/ha
		Qt kt	% world	kg/ha	Wheat kg/ha	Rice kg/ha	Maize kg/ha	Oth cer kg/ha	Soybeans kg/ha	Oil palm kg/ha	Other OC kg/ha	Fibre kg/ha	Sugar kg/ha	R&T kg/ha	F+T kg/ha	Vege kg/ha		
Slovenia	N	25	0.02	52	120	NA	117	70	NA	NA	90	NA	NA	90	22	83	25	73
	P2O5	8	0.02	17	35	NA	42	27	NA	NA	33	NA	NA	55	16	42	7	18
	K2O	10	0.02	20	49	NA	45	31	NA	NA	53	NA	NA	101	24	100	6	19
	N+P2O5+K2O	43	0.02	89	204	NA	204	127	NA	NA	176	NA	NA	246	62	225	38	110
Cyprus	N	4	0.004	44	55	NA	NA	50	NA	NA	NA	NA	NA	60	30	60	10	39
	P2O5	2	0.004	19	20	NA	NA	20	NA	NA	NA	NA	NA	30	20	35	4	10
	K2O	2	0.004	17	12	NA	NA	12	NA	NA	NA	NA	NA	12	30	30	3	5
	N+P2O5+K2O	8	0.004	80	87	NA	NA	81	NA	NA	NA	NA	NA	102	80	125	17	54

Where: "Qt kt" = quantity in 1000 tonnes, "% world" = the % of world consumption of a nutrient for all crops, "kg/ha" = mean kilograms per ha of nutrient applied as inorganic fertilizer, "Oth cer" = other cereals, "Other OC" = other oil crops, "R&T" = roots and tubers, "F&T" = fruits and treenuts, "Vege" = vegetables, "Grass" = grassland.