

# Agricultural Inputs

Sources: Food and Agriculture Organization of the United Nations (FAO) and the International Federation of Organic Agricultural Movements (IFOAM)



	Arable and Permanent Cropland (000 hectares) 2000	Agricultural Labor (a)		Tractor Use		Irrigated Land, % of Total Cropland (b) 2000	Average Fertilizer Use (kg per ha of cropland) 2000	Average Pesticide Use (kg per ha of cropland) 2000	Cropland Under Organic Management	
		as a Percent of Total Labor Force 2001	Workers per Hectare of Cropland 2000	Number of Tractors 2000	Tractors per 1000 Hectares of Cropland 2000				Total (hectares) 2003	as a % of all Cropland (c) 2003
<b>WORLD</b>	<b>1,497,365</b>	<b>44.3</b>	<b>0.9</b>	<b>26,409,666</b>	<b>17.6</b>	<b>18.1</b>	<b>91.1</b>	<b>..</b>	<b>22,811,267</b>	<b>..</b>
<b>ASIA (EXCL. MIDDLE EAST)</b>	<b>476,606</b>	<b>57.0</b>	<b>2.1</b>	<b>5,910,645</b>	<b>12.4</b>	<b>35.3</b>	<b>144.0</b>	<b>..</b>	<b>413,761</b>	<b>..</b>
Armenia	560	12.4	0.4	17,500	31.3	51.3	12.5	..	..	..
Azerbaijan	1,907	26.2	0.5	30,093	15.8	76.3	1.1	..	2,500	0.2
Bangladesh	8,484	54.7	4.6	5,530	0.7	49.4	156.3	0.4	..	..
Bhutan	160	93.7	5.9	..	..	25.0	..	0.1	..	..
Cambodia	3,807	69.7	1.2	1,855	0.5	7.1	..	..	..	..
China	135,557	66.0	3.8	841,073	6.2	40.1	255.6	..	301,295	0.1
Georgia	1,062	19.4	0.5	17,199	16.2	44.2	37.7	..	..	..
India	169,700	59.2	1.6	1,525,000	9.0	32.3	98.6	..	41,000	< 0.05
Indonesia	33,546	47.7	1.5	70,000	2.1	14.4	73.8	..	40,000	0.1
Japan	4,830	3.8	0.6	2,028,000	419.9	54.7	301.0	..	5,083	0.1
Kazakhstan	21,671	17.3	0.1	49,652	2.3	10.8	1.7	..	..	..
Korea, Dem People's Rep	2,000	29.4	1.7	70,000	35.0	73.0	175.5	..	..	..
Korea, Rep	1,919	9.3	1.2	191,631	99.9	59.9	407.3	12.8	902	0.1
Kyrgyzstan	1,435	25.1	0.4	25,434	17.7	74.7	20.2	..	..	..
Lao People's Dem Rep	958	76.3	2.1	1,080	1.1	18.3	9.1	0.0	150	< 0.05
Malaysia	7,605	17.9	0.2	43,300	5.7	4.8	187.8	..	131	..
Mongolia	1,176	23.6	0.3	4,700	4.0	7.1	2.9	..	..	..
Myanmar	10,495	69.9	1.7	11,000	1.0	18.9	20.0	..	..	..
Nepal	2,968	92.9	3.4	4,600	1.5	38.2	25.6	..	45	..
Pakistan	21,960	46.6	1.1	320,500	14.6	82.4	135.1	1.3	2,009	0.1
Philippines	10,050	38.9	1.2	11,500	1.1	15.4	73.1	..	2,000	< 0.05
Singapore	1	0.1	3.0	65	65.0	..	..	..	..	..
Sri Lanka	1,910	45.2	2.0	8,000	4.2	34.8	128.9	..	15,215	0.7
Tajikistan	860	33.1	0.9	30,000	34.9	83.6	10.5	..	..	..
Thailand	18,000	55.7	1.2	220,000	12.2	27.8	86.1	1.1	3,429	< 0.05
Turkmenistan	1,695	33.0	0.4	50,000	29.5	106.2	62.2	..	..	..
Uzbekistan	4,850	27.0	0.6	170,000	35.1	88.3	149.9	..	..	..
Viet Nam	7,350	66.9	3.7	162,746	22.1	40.8	285.3	..	2	..
<b>EUROPE</b>	<b>305,891</b>	<b>8.4</b>	<b>0.1</b>	<b>10,982,754</b>	<b>35.9</b>	<b>8.1</b>	<b>72.5</b>	<b>..</b>	<b>5,236,227</b>	<b>..</b>
Albania	699	47.6	1.1	8,200	11.7	48.6	13.3	..	..	..
Austria	1,470	4.9	0.1	330,000	224.5	0.3	151.7	2.4	285,500	11.3
Belarus	6,257	12.6	0.1	72,902	11.7	1.8	128.7	..	..	..
Belgium	..	1.8	..	..	..	..	..	..	22,410	1.6
Bosnia and Herzegovina	650	4.8	0.1	29,000	44.6	0.5	64.3	..	..	..
Bulgaria	4,636	6.6	0.1	25,000	5.4	17.3	31.4	..	500	..
Croatia	1,586	7.9	0.1	2,300	1.5	0.2	139.8	..	120	..
Czech Rep	3,318	7.9	0.1	96,716	29.1	0.7	90.4	1.3	218,114	5.1
Denmark	2,289	3.6	0.0	123,221	53.8	19.5	159.9	1.4	174,600	6.5
Estonia	1,134	11.0	0.1	50,624	44.6	0.4	25.6	0.1	20,141	2.0
Finland	2,191	5.3	0.1	194,000	88.5	2.9	140.6	0.5	147,943	6.6
France	19,582	3.2	0.0	1,264,000	64.5	11.2	211.7	4.6	419,750	1.4
Germany	12,020	2.4	0.1	1,030,800	85.8	4.0	228.2	2.5	632,165	3.7
Greece	3,854	16.2	0.2	243,000	63.1	37.6	118.7	2.8	31,118	0.6
Hungary	4,803	10.3	0.1	113,000	23.5	4.4	98.2	..	105,000	1.8
Iceland	7	8.2	1.9	9,019	1,288.4	..	..	..	..	..
Ireland	1,053	9.8	0.2	167,000	158.6	..	594.5	1.8	30,070	0.7
Italy	10,825	5.1	0.1	1,750,000	161.7	24.9	159.4	..	1,230,000	7.9
Latvia	1,874	11.7	0.1	55,815	29.8	1.1	27.0	..	20,000	0.8
Lithuania	2,992	11.8	0.1	102,000	34.1	0.2	53.5	0.2	6,769	0.2
Macedonia, FYR	599	12.1	0.2	54,000	90.2	9.2	76.3	..	..	..
Moldova, Rep	2,190	21.9	0.2	42,000	19.2	14.0	2.3	..	..	..
Netherlands	944	3.3	0.3	149,500	158.4	59.9	450.2	9.4	38,000	1.9
Norway	883	4.4	0.1	133,000	150.6	14.4	222.0	0.4	26,673	2.6
Poland	14,330	21.2	0.3	1,306,700	91.2	0.7	106.0	0.5	44,886	0.3
Portugal	2,705	12.3	0.2	169,000	62.5	24.0	84.3	5.3	70,857	1.8
Romania	9,865	14.4	0.2	160,053	16.2	27.1	37.0	1.0	18,690	0.2
Russian Federation	126,820	10.2	0.1	785,000	6.2	3.6	11.2	..	5,276	..
Serbia and Montenegro	3,736	19.1	0.3	397,391	106.4	..	..	..	15,200	0.3
Slovakia	1,576	8.8	0.2	23,479	14.9	11.6	64.3	1.8	58,706	2.4
Slovenia	204	1.8	0.1	114,188	559.7	1.5	369.4	..	5,280	0.7
Spain	18,217	7.0	0.1	885,000	48.6	20.1	118.0	..	485,079	1.7
Sweden	2,706	3.0	0.1	165,000	61.0	4.2	103.5	0.6	193,611	6.3
Switzerland	437	4.1	0.4	112,000	256.3	5.7	233.4	..	102,999	9.7
Ukraine	33,496	14.0	0.1	318,900	9.5	7.2	13.1	..	164,449	0.4
United Kingdom	5,928	1.8	0.1	500,000	84.3	1.8	285.8	..	679,631	4.0
<b>MIDDLE EAST &amp; N. AFRICA</b>	<b>97,654</b>	<b>32.2</b>	<b>0.5</b>	<b>1,659,865</b>	<b>17.0</b>	<b>28.5</b>	<b>68.8</b>	<b>..</b>	<b>..</b>	<b>..</b>
Afghanistan	8,054	66.6	0.7	840	0.1	29.6	0.6	..	..	..
Algeria	8,195	24.1	0.3	93,000	11.3	6.8	11.3	..	..	..
Egypt	3,291	32.6	2.6	86,000	26.1	100.0	385.8	..	15,000	0.2
Iran, Islamic Rep	16,326	26.0	0.4	237,000	14.5	45.9	80.8	..	..	..
Iraq	5,540	9.6	0.1	49,600	9.0	63.6	67.0	0.1	..	..
Israel	418	2.6	0.2	24,500	58.6	46.4	256.0	..	7,000	1.3
Jordan	401	11.1	0.4	5,732	14.3	18.7	49.4	1.4	..	..
Kuwait	10	1.1	0.9	89	8.9	70.0	62.9	..	..	..
Lebanon	332	3.5	0.1	8,300	25.0	31.3	199.6	..	250	0.1
Libyan Arab Jamahiriya	2,150	5.6	0.0	34,000	15.8	21.9	26.5	..	..	..
Morocco	9,734	35.3	0.4	43,226	4.4	13.4	37.2	..	11,956	0.1
Oman	80	35.0	3.2	150	1.9	77.5	66.6	1.2	..	..
Saudi Arabia	3,785	9.2	0.2	9,500	2.5	42.8	104.6	..	..	..
Syrian Arab Rep	5,352	27.3	0.3	97,660	18.2	22.6	68.3	0.6	74	..
Tunisia	5,014	24.3	0.2	35,100	7.0	7.6	22.2	..	18,255	0.4
Turkey	26,672	45.5	0.5	905,000	33.9	16.9	78.3	1.3	57,001	0.1
United Arab Emirates	247	4.7	0.3	380	1.5	30.8	142.1	..	..	..
Yemen	1,669	49.9	1.7	5,800	3.5	30.0	11.3	0.8	..	..



	Arable and Permanent Cropland (000 hectares) 2000	Agricultural Labor (a)		Tractor Use		Irrigated Land, % of Total Cropland (b) 2000	Average Fertilizer Use (kg per ha of cropland) 2000	Average Pesticide Use (kg per ha of cropland) 2000	Cropland Under Organic Management	
		as a Percent of Total Labor Force	Workers per Hectare of Cropland 2000	Number of Tractors 2000	Tractors per 1000 Hectares of Cropland 2000				Total (hectares) 2003	as a % of all Cropland (c) 2003
<b>SUB-SAHARAN AFRICA</b>	<b>176,712</b>	<b>62.0</b>	<b>1.0</b>	<b>234,661</b>	<b>1.3</b>	<b>3.8</b>	<b>11.5</b>	..	..	..
Angola	3,300	71.6	1.3	10,300	3.1	2.3	0.4	..	..	..
Benin	2,215	53.0	0.7	185	0.1	0.5	15.9	..	81	..
Botswana	373	44.3	0.8	6,000	16.1	0.3	12.3	..	..	..
Burkina Faso	3,850	92.2	1.3	1,995	0.5	0.6	8.8	..	..	..
Burundi	1,260	90.2	2.4	170	0.1	5.9	2.8	..	..	..
Cameroon	7,160	58.2	0.5	500	0.1	0.5	..	0.1	2,500	< 0.05
Central African Rep	2,020	71.8	0.6	30	< 0.05	..	0.3	..	..	..
Chad	3,550	74.3	0.8	175	< 0.05	0.6	4.9	..	..	..
Congo	220	39.9	2.3	700	3.2	0.5	22.7	..	..	..
Congo, Dem Rep	7,880	62.7	1.7	2,430	0.3	0.1	0.1	..	..	..
Côte d'Ivoire	7,350	48.1	0.4	3,800	0.5	1.0	9.9	..	..	..
Equatorial Guinea	230	70.1	0.6	100	0.4	..	..	..	..	..
Eritrea	501	77.2	2.8	463	0.9	4.2	21.8	..	..	..
Ethiopia	10,728	82.0	2.1	3,000	0.3	1.8	14.7	0.1	..	..
Gabon	495	36.6	0.4	1,500	3.0	3.0	0.6	..	..	..
Gambia	235	78.6	2.2	45	0.2	0.9	3.4	..	..	..
Ghana	5,809	56.6	0.9	3,570	0.6	0.2	2.0	0.0	5,453	< 0.05
Guinea	1,485	83.5	2.3	542	0.4	6.4	2.2	..	..	..
Guinea-Bissau	350	82.5	1.3	19	0.1	4.9	6.9	..	..	..
Kenya	4,520	75.0	2.6	14,400	3.2	1.5	31.3	..	494	..
Lesotho	325	37.6	1.0	2,000	6.2	0.3	16.9	..	..	..
Liberia	595	67.0	1.3	325	0.5	0.5	..	..	..	..
Madagascar	3,500	73.8	1.6	3,550	1.0	31.1	2.6	..	1,230	..
Malawi	2,240	82.4	2.0	1,430	0.6	1.3	14.6	0.3	298	< 0.05
Mali	4,674	80.4	1.0	2,600	0.6	3.0	11.1	..	..	..
Mauritania	500	52.6	1.2	380	0.8	9.8	..	..	..	..
Mozambique	4,135	80.3	1.9	5,750	1.4	2.6	3.5	..	..	..
Namibia	820	40.5	0.4	3,150	3.8	0.9	0.4	..	..	..
Niger	4,500	87.5	1.0	128	< 0.05	1.5	1.0	0.0	..	..
Nigeria	30,850	32.4	0.5	30,000	1.0	0.8	6.1	..	..	..
Rwanda	1,150	90.2	3.2	90	0.1	0.4	0.3	0.1	..	..
Senegal	2,400	73.4	1.3	700	0.3	3.0	18.9	0.2	2,500	0.1
Sierra Leone	550	61.6	1.8	82	0.1	5.5	0.3	..	..	..
Somalia	1,067	70.7	2.5	1,840	1.7	18.7	0.5	..	..	..
South Africa	15,712	9.3	0.1	72,300	4.6	9.5	48.2	..	45,000	0.1
Sudan	16,433	60.2	0.5	11,050	0.7	11.9	2.3	0.0	..	..
Tanzania, United Rep	4,950	80.0	2.9	7,600	1.5	3.2	4.5	..	5,155	< 0.05
Togo	2,630	59.1	0.4	80	< 0.05	0.3	7.5	..	..	..
Uganda	6,960	79.6	1.3	4,700	0.7	0.1	0.7	..	122,000	1.4
Zambia	5,279	68.6	0.6	6,000	1.1	0.9	5.7	..	5,688	< 0.05
Zimbabwe	3,350	61.9	1.1	24,000	7.2	3.5	49.3	..	40	..
<b>NORTH AMERICA</b>	<b>224,703</b>	<b>2.0</b>	<b>&lt; .05</b>	<b>5,511,465</b>	<b>24.5</b>	<b>10.3</b>	<b>93.4</b>	..	<b>1,380,600</b>	..
Canada	45,700	2.3	< 0.05	711,335	15.6	1.6	54.2	..	430,600	0.6
United States	179,000	2.0	< 0.05	4,800,000	26.8	12.5	103.4	..	950,000	0.2
<b>C. AMERICA &amp; CARIBBEAN</b>	<b>43,046</b>	<b>23.4</b>	<b>0.4</b>	<b>308,990</b>	<b>7.2</b>	<b>19.3</b>	<b>67.2</b>	..	<b>211,127</b>	..
Belize	89	30.5	0.3	1,150	12.9	3.4	69.0	..	1,810	1.3
Costa Rica	505	19.6	0.6	7,000	13.9	21.4	385.0	51.2	8,974	2.0
Cuba	4,465	13.8	0.2	78,000	17.5	19.5	30.3	..	8,495	0.1
Dominican Rep	1,596	16.0	0.4	1,868	1.2	17.2	54.3	2.1	14,963	0.4
El Salvador	810	28.4	1.0	3,430	4.2	4.9	103.0	..	4,900	0.3
Guatemala	1,905	45.5	1.0	4,300	2.3	6.8	111.1	..	14,746	0.3
Haiti	910	61.7	2.4	140	0.2	8.2	15.9	0.0	..	..
Honduras	1,427	30.8	0.5	5,200	3.6	5.6	126.5	2.5	1,769	0.1
Jamaica	274	20.3	1.0	3,080	11.2	9.1	81.8	..	205	< 0.05
Mexico	27,300	20.9	0.3	185,000	6.8	23.8	67.1	..	143,154	0.1
Nicaragua	2,746	19.3	0.1	2,700	1.0	3.2	10.7	..	7,000	0.1
Panama	655	19.8	0.4	5,000	7.6	5.3	51.2	..	5,111	0.2
Trinidad and Tobago	122	8.5	0.4	2,700	22.1	2.5	48.4	..	..	..
<b>SOUTH AMERICA</b>	<b>116,353</b>	<b>17.4</b>	<b>0.2</b>	<b>1,293,036</b>	<b>11.1</b>	<b>8.9</b>	<b>88.4</b>	..	<b>4,675,840</b>	..
Argentina	27,200	9.5	0.1	280,000	10.3	5.7	30.3	..	3,192,000	1.9
Bolivia	2,206	43.9	0.7	6,000	2.7	6.0	3.4	..	19,634	0.1
Brazil	65,200	16.1	0.2	806,000	12.4	4.5	114.0	..	275,576	0.1
Chile	2,297	15.5	0.4	54,000	23.5	78.4	212.9	..	273,000	1.5
Colombia	4,545	19.9	0.8	21,000	4.6	18.7	144.8	16.7	30,000	0.2
Ecuador	3,001	25.2	0.4	8,900	3.0	28.8	54.8	6.0	60,000	0.7
Guyana	496	17.3	0.1	3,630	7.3	30.2	25.4	..	425	< 0.05
Paraguay	2,378	33.9	0.3	16,500	6.9	2.8	27.4	1.5	61,566	0.3
Peru	4,210	29.7	0.7	13,191	3.1	28.4	57.9	1.2	84,908	0.3
Suriname	67	18.5	0.4	1,330	19.9	76.1	86.6	2.6	250	0.3
Uruguay	1,340	12.5	0.1	33,000	24.6	13.4	94.9	2.7	678,481	4.0
Venezuela	3,400	7.8	0.2	49,000	14.4	16.9	74.1	..	..	..
<b>OCEANIA</b>	<b>55,523</b>	<b>18.6</b>	<b>&lt; 0.05</b>	<b>401,459</b>	<b>7.2</b>	<b>4.9</b>	<b>57.4</b>	..	<b>10,567,903</b>	..
Australia	50,600	4.5	< 0.05	315,000	6.2	4.7	45.5	..	10,500,000	2.3
Fiji	285	39.6	0.5	7,000	24.6	1.1	26.3	..	200	< 0.05
New Zealand	3,280	8.9	0.1	76,000	23.2	8.7	255.5	..	63,438	0.4
Papua New Guinea	855	73.6	2.0	1,160	1.4	..	13.7	..	4,265	0.4
Solomon Islands	60	72.6	2.7	9	0.2	..	..	..	..	..
<b>DEVELOPED</b>	<b>639,471</b>	<b>7.1</b>	<b>0.1</b>	<b>19,399,767</b>	<b>30.3</b>	<b>10.6</b>	<b>77.5</b>	..	<b>17,239,848</b>	..
<b>DEVELOPING</b>	<b>857,017</b>	<b>54.8</b>	<b>1.5</b>	<b>6,903,108</b>	<b>8.1</b>	<b>24.0</b>	<b>102.6</b>	..	..	..

a. Agricultural workers include workers in the hunting, fishing and forestry sectors. b. Some figures may be greater than 100% due to measurement inconsistencies.

c. Data provided by IFOAM use figures for total cropland that differ from the FAO estimates for total arable and permanent cropland. d. Data only covers agricultural enterprises.

Private farms are not included. e. Public sector only. f. Data refer to sales for agricultural use. g. Data refer to formulated products. h. Data refer to use of pesticides in enterprises only.

i. Data refer to quantities imported for agricultural use.

# Technical Notes

## VARIABLE DEFINITIONS AND METHODOLOGY

**Arable and permanent cropland, in hectares**, refers to the total area of land comprised of either arable or permanent cropland. Arable land is land under temporary crops (double-cropped areas are counted only once), temporary meadows for mowing or pasture, land under market and kitchen gardens, and land temporarily fallow (less than five years). Abandoned land resulting from shifting cultivation is not included in this category. Data for "Arable land" are not meant to indicate the amount of land that is potentially cultivable. Permanent cropland is land that is cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee and rubber; this category includes land under flowering shrubs, fruit trees, nut trees and vines, but excludes land under trees grown for wood or timber.

Data on land use is reported by country governments, in surveys distributed by the FAO. However, for this dataset, a significant percentage of data is based on estimates conducted by the FAO, and some data are based on unofficial estimates.

**Agricultural labor as a percentage of the total labor force** is calculated by WRI by dividing the number of agricultural workers by the total number of workers in the labor force. Agricultural labor force is the number of economically active persons engaged in agriculture, hunting, forestry or fishing. According to ILO, the economically active population "comprises all persons of either sex who furnish the supply of labour for the production of economic goods and services as defined by the United Nations systems of national accounts and balances during a specified time-reference period." For a complete definition, see the *Resolution concerning statistics of the economically active population, employment, unemployment and underemployment*, adopted by the Thirteenth International Conference of Labour Statisticians (available online at: <http://www.ilo.org/public/english/bureau/stat/res/ecacpop.htm>).

Data on total number of agricultural workers are compiled by FAO from the ILO's dataset titled *Economically Active Population, 1950-2010* (available online at: <http://laborsta.ilo.org/>). These data are derived from population censuses, sample surveys of the economically active population, and other related surveys. In cases where country data are lacking, data are obtained by extrapolation, either by using information from socio-economically and culturally similar neighboring countries or by using special models of activity rates. Annual figures are obtained through interpolating and extrapolating from the ILO decennial series.

**Agricultural labor intensity, number of workers per hectare** shows the labor input intensity of agricultural systems. It is calculated by WRI by dividing the number of agricultural workers by the number of hectares of arable and permanent cropland. Values vary widely among countries according to labor scarcity, production technologies, costs of energy and machinery, etc.

**Number of tractors in use** refers to the total number of wheeled and crawler tractors used in agriculture. Garden tractors are excluded. **Tractors per 1000 Hectares of Cropland** is calculated by WRI by dividing the number of tractors in use by the total hectares of arable and permanent cropland. Data for agricultural machinery are reported by country governments through surveys. Individual countries have different methods of data collection.

**Irrigated land as a percentage of total cropland** is calculated by WRI by dividing the hectares of land equipped for irrigation by the total hectares of arable and permanent cropland. Types of irrigated land include full and partial control irrigation, spate irrigation areas, and equipped wetland or inland valley bottoms. Data on irrigated land is reported by country governments, in surveys distributed by the FAO. However, for this dataset, a significant percentage of data is based on estimates conducted by the FAO, and some data are based on unofficial estimates.

---

**Fertilizer use, kilograms per hectare**, is calculated by WRI by dividing the total fertilizer consumption, measured in kilograms of plant nutrient, by the total hectares of arable and permanent cropland. The measure of fertilizer consumption is an aggregate of nitrogenous, phosphate and potash fertilizers.

The Food and Agriculture Organization of the United Nations (FAO) collects data on fertilizer use through surveys distributed to participating governments. In addition, the Ad Hoc Working Party on Fertilizer Statistics works to improve geographic coverage of the data. Hectares of arable and permanent cropland are determined through a variety of means, including self-reporting from governments and FAO estimation methods.

**Pesticide use, kilograms per hectare**, is calculated by WRI by dividing the total pesticide consumption, measured in kilograms of active ingredients, by the total hectares of arable and permanent cropland. Pesticides are organized into eight categories, the sum of which is used to determine total pesticide consumption. The eight categories are: insecticides, mineral oils, herbicides, fungicides and bactericides, seed treatment - fungicides, seed treatment - insecticides, plant growth regulators and rodenticides.

FAO originally collected data for individual pesticides three decades ago through administering the Pesticides Consumption Annual Questionnaire to participating governments. Following poor response from the questionnaire, FAO, in cooperation with the Commission of the European Union, simplified the survey to include only major groupings of pesticides. The current database contains the results of these more recent surveys.

**Hectares under organic management** refers to number of hectares of land either fully converted to organic agriculture or in the process of conversion. **Percent of total agricultural land under organic management** shows the portion of agricultural land converted to organic or in the process of conversion. The percentages are calculated by IFOAM. The area of total agricultural land used in this calculation is not the same as that used by the FAO for total arable and permanent cropland, presented in the first column of this table.

Definitions of organic agriculture vary between countries. According to the FAO/WHO Codex Alimentarius Commission Guidelines for the Production, Processing, Labeling and Marketing of Organically Produced Foods, 1999, "organic agriculture is holistic production management systems which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity... Organic production systems are based on specific and precise standards of production which aim at achieving optimal agro-ecosystems which are socially, ecologically and economically sustainable. Terms such as "biological" and "ecological" are also used in an effort to describe the organic system more clearly. Requirements for organically produced foods differ from those for other agricultural products in that production procedures are an intrinsic part of the identification and labeling of, and claim for, such products." Data for organic agriculture, collected by IFOAM, are based on a variety of collection methods, such as surveys, research and country experts.

#### **FREQUENCY OF UPDATE BY DATA PROVIDERS**

**Arable and permanent cropland, tractor usage, irrigated land, fertilizer use and pesticide use, FAO:** As of June 2003, data were available through 2002. FAO updates these data annually.

**Organic agriculture, IFOAM:** IFOAM first published data on international organic agriculture in 1998 and updates the information annually.

#### **DATA RELIABILITY AND CAUTIONARY NOTES:**

**Arable and permanent cropland** data are based either on reports from national governments or FAO estimates. Often definitions of land use categories differ between countries making it difficult to make comparisons.

Data for **agricultural labor** were estimated by ILO from the decennial population series by interpolating and extrapolating past trends. Because of this estimation method, yearly fluctuations in these data may not be accurately captured. Figures for agricultural labor include workers in agriculture, hunting, forestry and fishing. As a result, some island nations with significant fishing sectors or small countries with extensive forestry sectors will have artificially high ratios that do not accurately reflect the labor intensity of farming activities.

Values for **number of tractors** and **tractor intensity** should be treated with caution, as there is no differentiation by tractor type or quality—for example, by horsepower rating.

WRI calculations for **irrigated land as a percentage of total cropland** may yield results over 100% due to inconsistencies in measurement methods or estimation for land use.

**Fertilizer and pesticide use per hectare** represent averages; actual distribution of fertilizer and pesticide may vary. Many countries do not report pesticide usage information and measurement methods among those that do report vary. Some countries report pesticide data in terms of hectograms of active ingredients, others in terms of formulated products and others as sales of pesticide products. Please see footnotes for country specific notes.

Data for **organic agriculture** is collected by IFOAM from a variety of sources, including member organizations, certification bodies and other institutions. Data collection methods vary depending on the institution and the country. Figures for **percent of total agricultural land under organic management** are calculated by IFOAM. Data on total agricultural land used in these calculations are different from those provided by FAO for total arable and permanent cropland.

For more information on agricultural systems and a more complete explanation of some of the indicators listed here, please consult the searchable database section of *EarthTrends: The Environmental Information Portal* ([http://earthtrends.wri.org/searchable\\_db/](http://earthtrends.wri.org/searchable_db/)) or:

Wood, S. et al. *Pilot Analysis of Global Ecosystems: Agroecosystems*. WRI: Washington, DC, 2000.

#### **SOURCES**

**Arable and permanent cropland, tractor usage, irrigated land, fertilizer use and pesticide use, FAO:** Food and Agriculture Organization of the United Nations (FAO), *FAOSTAT on-line statistical service*. Available on-line at <http://apps.fao.org>. FAO: Rome, 2003.

**Organic agriculture, IFOAM:** Minou Youssefi and Helga Willer (Editors). 2003. *The World of Organic Agriculture - Statistics and Future Prospects - 2003*. Tholey-Theley, Germany: International Federation of Organic Agriculture Movements (IFOAM). Electronic version available at: <http://www.ifoam.org>.