

Worldwide Production of Blackberries

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Abstract

This review is based on a survey of worldwide blackberry production conducted in 2005. In 2005, there were an estimated 20,035 ha of blackberries planted and commercially cultivated worldwide, a 45% increase from estimated area in 1995. Wild blackberries still make a significant contribution to worldwide production with 8,000 ha and 13,460 tons harvested in 2004. There were 7692 ha of commercially cultivated blackberries in Europe with Serbia accounting for 69% of the area in Europe and also the largest producer in the world. The next largest producing countries in Europe were Hungary (1,600 ha), the United Kingdom, Romania, Poland, Germany, and Croatia. There were 7,159 ha of commercially cultivated blackberries in North America in 2005 with the USA accounting for 67% of the area planted and the second highest in the world with 4,818 ha. Sixty-five percent of the blackberries cultivated in the USA were planted in Oregon, where trailing blackberries such as ‘Marion’ are most common. Mexico accounted for 32% of the planted area in North America in 2005 with 2,300 ha. Blackberry production in this country increased from 230 ha in 1995 and is projected to grow to at least 5,000 ha by 2015. In Mexico, production systems are modified to extend the production season for ‘Tupy’ and other erect type cultivars from mid-October to early May for the fresh export market and May to June for their local market. There were 1,640 ha of commercially cultivated blackberries in Central America in 2005 with 1,590 tons produced; most of this production was in Costa Rica, but very little was exported. In South America, 6,380 tons of blackberries were harvested from 1,597 ha. Ecuador accounted for 53% of the planted area in this continent, but exported very little fruit. In contrast, Chile exported almost 10,000 tons of blackberries in 2004 from 450 ha of commercial blackberries and from wild plantings. In Chile, area planted increased 50% from 1995 to 2005 and is projected to be 800 ha in 2015, provided competition from Mexico does not adversely affect cost of production and competitiveness. China accounted for all of the production in Asia with 1,550 ha and 26,350 tons in 2005. Over 90% of the area was planted to semi-erect blackberry. There were 2,528 ha of organic blackberry production reported in the world in 2005. Use of tunnel production was reported on 315 ha worldwide with tunnels mostly being used to protect against adverse weather. Of the blackberry area planted worldwide, 50% of the cultivars were semi-erect, 25% erect, and 25% trailing types. ‘Thornfree’, ‘Loch Ness’, and ‘Chester Thornless’ were the most important semi-erect types and ‘Brazos’ and ‘Marion’ the most common erect and trailing types, respectively. Based on this survey, there may be 27,032 ha of commercial blackberries planted worldwide in 2015, not including

production from harvested wild plants.

INTRODUCTION

Blackberries (*Rubus* spp.) have long been a favorite wild fruit, as many species are native to several countries worldwide and are picked for personal or commercial use. Natural hybrids of wild species provided several of the first named cultivars including, for example, 'Eldorado' (*R. allegheniensis* × *R. frondosus*) introduced in the mid 1850s in the USA (Hall, 1990; Moore, 1984).

More modern developments include the release of 'Darrow' by Cornell's New York State Agricultural Experiment Station in 1958, 'Brazos' by Texas A&M University in 1959, and the thornless, semi-erect cultivars, Smoothstem and Thornfree, in 1966 in the USA; some of these cultivars are still important worldwide today.

Blackberries are often classified according to their cane architecture into four types: erect, semi-erect and trailing (Strik, 1992). Erect-caned cultivars include the thorny 'Brazos', 'Tupy', 'Cherokee' and the thornless 'Navaho' and 'Arapaho'. Semi-erect types include 'Chester Thornless', 'Thornfree', 'Loch Ness' and 'Cacanska Bestrna'. Trailing types such as 'Marion', 'Silvan' and 'Thornless Evergreen' and the blackberry, raspberry hybrids 'Boysen' and 'Logan' have a trailing growth habit. The new primocane-fruiting cultivars Prime-Jan and Prime-Jim are erect, thorny types.

In 1990, results of survey reported 3,180 ha of blackberries in the northwestern region (Strik, 1992) and 1,205 ha in the eastern USA (Clark, 1992) for a total of 4,385 ha. In 1990, most of the blackberry production in the eastern USA was pick-your-own or pre-picked for on-farm or local sales and less than 2% was processed (Clark, 1992). In contrast, over 90% and 50% of the trailing blackberry crop in Oregon and California, respectively, was processed in 1990. Over 80% of the production from the 55 ha of erect and semi-erect blackberries in northwestern USA was marketed fresh in 1990 (Strik, 1992).

In the 1990s, blackberries were not found on grocery store shelves in the eastern USA, and only rarely in the western USA (Clark, 2005). Late in the 1990s, 'Chester Thornless' became a major shipping blackberry, as it was found to have good fruit firmness. 'Navaho', from the University of Arkansas, was found to have excellent shelf-life and could be shipped. These and other cultivars contributed to a major shift in the production outlook for shipping of blackberries from that of a local-marketed crop to one shipped for retail marketing (Clark, 2005).

In the mid to late 1990s, the shipping of blackberries from Chile, Guatemala, and Mexico into the USA provided fresh blackberries during the "off-season" autumn, winter, and spring months and increased consumer awareness of this berry crop and consequently increased sales of USA produced fruit in the "on" season also. Production of blackberries was apparently on the increase worldwide; however, there was relatively little factual information on area planted, cultivars grown, and most common production systems.

This review is based on a survey of worldwide blackberry production conducted in 2005. Included in the many questions asked were an estimate of area planted in 1995 and projections for 2015. We appreciate the contributions of the many research and Extension colleagues and industry members who provided additional information (see acknowledgements section).

RESULTS AND DISCUSSION

In 2005, there were an estimated 20,035 ha of blackberries planted and commercially cultivated worldwide (Table 1), a 45% increase from estimated area in 1995 (Fig. 1). Wild blackberries still make a significant contribution to worldwide production and although accurate data are hard to obtain, survey respondents estimated that 3,600 ha of wild blackberry (*R. glaucus*) in Ecuador, 2,400 ha in Romania (*R. armeniicus*, *R. laciniatus*), 2,000 ha in Chile (derived from introduced *R. ulnifolius*), a small area of unknown size in Mexico (mainly *R. coriifolius*), and 100 ha of planted *R. glaucus* in Venezuela were harvested in 2005. The 8,000 ha of wild blackberries

harvested in 2005 had a total reported production of 13,460 tons. In some regions like the Pacific Northwestern region of North America, the fruit harvested from wild blackberries, even though for personal use, may negatively impact sales of commercially grown fruit.

Worldwide blackberry production was 140,292 tons in 2005, not including the wild production mentioned above (Table 1). In the following sections, we will provide more information on blackberry area and production systems in the major producing regions of the world. We will include little information on production in countries with less than 100 ha planted (Table 2).

Europe

There were 7692 ha of commercially cultivated blackberries in Europe in 2005 (Table 1). Serbia accounted for 69% of the blackberry area in Europe with 5,300 ha and was also the largest producer in the world (Fig. 1). Serbia produced 25,000 tons, the fourth highest production in the world (Fig. 2), with 90% of their production processed and exported. Only semi-erect blackberry types were grown in Serbia with the predominant cultivars being 'Thornfree', 'Dirksen', and 'Smoothstem' that produce in July and August. 'Čačanska Bestrna', a new cultivar from the Investigation, Production, and Trade Center of Horticulture, Cacak that produces as high as 45 t ha⁻¹ and 22 g sized fruit is being widely planted. Plants are generally established at an in-row spacing of 1 to 1.5 m with 2.5 to 3 m between rows. Winter cold injury is considered one of the biggest production issues.

Hungary was the next largest producer in Europe with 1,600 ha or 21% of the total area and 12,000 tons. 'Loch Ness' accounted for 75% of the blackberry area and 90% of the total production was processed and exported. Countries in Europe with 100 ha or more were the United Kingdom, Romania, and Poland (100 ha each), Germany (110 ha), and Croatia (180 ha). In the United Kingdom and Germany, most of their production is for fresh, domestic use. In Germany and Romania, 'Loch Ness' is the main cultivar grown. Area in Poland has doubled in the last ten years. There were 500 tons produced in 2005 with 80% processed and most of this was exported. Most of the fresh production was also exported. 'Gazda', from the Institute of Pomology and Floriculture in Skierniewice, Poland, accounted for 80% of the area planted in Poland. Typical yields are 5 to 8 t ha⁻¹. Other countries in Europe producing blackberries are listed in Table 2.

North America

There were 7,159 ha of commercially cultivated blackberries in North America in 2005 (Table 1).

1. USA. The USA accounted for 67% of the area planted to blackberries in North America in 2005 with 4,818 ha, the second highest in the world (Fig. 1). Area planted in the USA increased 28% from 1995 to 2005. The USA had the highest production, 31,841 tons, in the world in 2005 (Fig. 2).

Sixty-five percent of the blackberries cultivated in the USA were planted in Oregon in 2005, 3,138 ha. Area in this state increased 25% from 1995 to 2005. Over 95% of the total production of 22,848 tons was processed with the remaining marketed fresh, all for domestic use.

Most (95%) of the blackberries in Oregon are trailing types, particularly the cultivars Marion (61%), Boysen (15%), Thornless Evergreen (11%), and Silvan (7%). The fruiting season for this type of blackberry ranges from late June through August, depending on cultivar. Trailing types are typically grown in every-year production systems at in-row spacing of 0.9 to 1.8 m with 3 m between rows. Most are grown on a trellis with the canes wrapped around two wires (top at 1.7 m second at 1.2 m). Most growers train primocanes in February, leaving canes more protected from cold, potentially injurious temperatures as compared to August training where canes are more exposed on the trellis. Alternate year production systems were not as common in 2005 as they were in 1990 (Finn et al., 1997; Strik, 1992), likely due to a shift to more every-year production after several cold winters in a row in the early 1990s. Machine harvesting of

trailing types for the processed market is done on more than 75% of the area. Typical yields range from 8 to 15 t ha⁻¹.

An estimated 125 ha of semi-erect types were planted in Oregon in 2005, mainly 'Chester Thornless' (82%) with an average yield of 30 t ha⁻¹. The main market for this and the other semi-erect cultivars is for late-season, early-August through October, fresh market. Only 1% of the blackberries in Oregon are erect types, mainly 'Cherokee' (63%) and 'Navaho' (30%), fruiting mainly in July and all hand-picked predominantly for fresh market. There are large research and breeding programs for blackberries in Oregon (USDA-ARS and Oregon State University).

The next largest blackberry producing state in the USA is California with 283 ha and 2,359 tons in 2005. The fruiting season is from mid-May through August. Half of the area is planted to trailing types. The production of 'Boysen' for processing in the central valley of California has declined steadily, as predicted (Strik, 1992), to only 40 ha. Most of the blackberry production in California is now located on the north-central coast and has a fresh market focus. Semi-erect blackberries, mainly 'Chester Thornless', account for 35% of the total area. There is no public breeding program for blackberries in California and little public research. Two private breeding companies, Driscoll Strawberry Associates Inc. and Plant Sciences International, have blackberry breeding programs. Proprietary cultivars account for 60% of the trailing types and 85% of the erect types grown in this state. In California, a continued decline is expected in area of 'Boysen' planted in the Central Valley in contrast to a 33% increase in area planted in the coastal area in the next 10 years.

Texas reported 275 ha and 726 tons in 2005. Only erect blackberries are planted with 'Kiowa', 'Brazos', and 'Roseborough' accounting for 85% of the area. Only 10% of the production is processed with 40% sold on-farm and 50% marketed to domestic, USA markets in the months of May-July.

Arkansas had 243 ha and about 1400 t of production, a 60% increase in planted area from 1995. A broad range of erect types were being grown including 'Arapaho', 'Navaho', 'Ouachita', 'Apache', 'Chickasaw', and 'Kiowa'. Eighty percent of their production is marketed fresh and the rest is sold on-farm from 20 May to 20 July. Area in Arkansas is projected to grow to 405 ha by 2015.

Area in Georgia has tripled in the last 10 years to 127 ha. However, growth projections for the next ten years were cautious as Mexico may be a large competitor for their fresh market season. Mainly erect types are grown in Georgia, with 'Arapaho' and 'Navaho' accounting for 60% of the area planted. Other than the strong blackberry breeding program at the University of Arkansas, few blackberry research programs were reported in the eastern USA.

In the USA, other than the aforementioned five states, four states reported from 50 to 100 ha planted in 2005. An additional 26 states reported from 2 to 50 ha of blackberries. Of note is Washington State which had less than 50 ha in 1995, but has doubled in area presently and is projected to grow to 140 ha by 2015.

2. Mexico. Mexico accounted for 32% of the planted area in North America in 2005 with 2,300 ha. Blackberry production in this country increased from 230 ha in 1995 and is projected to grow to at least 5,000 ha by 2015. About 93% of the area was planted in the State of Michoacan in 2005. There was also some production in the State of Jalisco and a new planting of semi-erect types in Chihuahua. The predominant type of blackberry grown was erect, particularly 'Brazos' and 'Tupy' (from Brazil) with relatively little (5%) semi-erect types, mainly proprietary cultivars, grown. Most of the Mexican production targets fresh export markets to the USA. In 2004, Mexico exported 7,480 tons to the USA, more than double their export volume in 2002.

In Mexico, production systems are modified to extend the production season for 'Tupy' and other erect type cultivars. About five to seven months after primocane emergence, a chemical defoliant is applied two to three times to induce ecto-dormancy. A growth regulator is used about three weeks after defoliation to promote bud break. Fruit harvest begins about 90 to 100 days after defoliation. After the first crop is finished, many

growers prune off the portion of the canes that fruited and repeat the defoliation process to obtain a second crop and sometimes a third. After growers have obtained from one to three crops on these canes, they mow the canes to ground level and burn the stubs, the cycle is then repeated. Often plants are grown in tunnels to protect fruit from adverse weather conditions. Using these methods, the Mexican fruiting season extends from mid-October to early May for the fresh export market and May to June for their local market. There is a new breeding program for blackberries in Mexico (Univ. Mechoacana de San Nicolas de Hidalgo), but no production/physiology research. Some private companies breed for cultivars adapted to the Mexican climate.

Central America

There were 1,640 ha of commercially cultivated blackberries in Central America in 2005 with 1,590 tons produced (Table 1). The two countries that reported commercial production were Costa Rica and Guatemala.

There were 1550 ha of blackberries (mainly ‘Brazos’ and *R. glaucus*) in Costa Rica located predominantly in the provinces of Cartago and San Jose. Most grow *R. glaucus* like a shrub without a trellis in organic production systems. Of the 1500 tons produced in 2005 less than 15% was exported. Presently most is used for local processed and fresh consumption.

Of note, is that blackberry area in Guatemala declined 63% from 1995 to 90 ha in 2005, but area is expected to increase 33% in the next ten years, provided this country can compete with Mexican production. Guatemala is the main country in Central America that ships fresh blackberries to the USA. There was no research programs on blackberry reported in Central America.

South America

There were 1,597 ha of commercially cultivated blackberries in South America in 2005 with 6,380 tons produced (Table 1).

Ecuador accounted for 53% of the planted area in South America with 850 ha. ‘Brazos’ and *R. glaucus* are the main types planted in organic production systems with an average yield of 15 t ha⁻¹ and 2.5 t ha⁻¹, respectively. There was an estimated 30% growth in planted areas from 1995 to 2005, but little growth is projected for the next ten years. Only 15% of their estimated 1,290 tons of production are exported for fresh market, mainly due to the soft fruit of *R. glaucus* and the Mediterranean fruit fly.

Chile had 450 ha of commercial blackberries in 2005 with a total production of 3,879 tons not including the 5,800 tons harvested from wild plantings and exported as a processed product. Area planted increased 50% from 1995 to 2005 and is projected to be 800 ha in 2015, provided competition from Mexico does not adversely affect cost of production and competitiveness. In 2004, Chile exported 9,679 tons of processed fruit (55 to 65% was harvested from introduced wild species) and 190 tons of fresh fruit. Their fruiting season is from November to May using all three types of blackberries, trailing, erect, and semi-erect. Production systems are similar to those reported for the USA.

Brazil had 250 ha and 780 tons of production in 2005 with only 15% of exported. All of their area is planted to erect blackberries, mainly ‘Tupy’ and ‘Guarani’ from the Embrapa Clima Temperado Research Center. Most of the production is processed for domestic use.

No other countries in South America reported more than 100 ha of area planted (Table 2). There was very little blackberry research reported other than the breeding program in Brazil and cultivar trials in Chile in 2005.

Asia

China accounted for all of the production in Asia with 1,550 ha and 26,350 tons in 2005 (Table 1). Over 90% of the area was planted to semi-erect blackberry, mainly seedlings of ‘Hull Thornless’ and ‘Chester Thornless’. The remaining area was planted to ‘Shawnee’ and the trailing ‘Boysen’, ‘Marion’, and ‘Siskiyou’. Most of China’s

production is in the Jiangsu Province, but the newest regions, in the Liaoning, Shandong, and Hebei Provinces, are projected to grow most in the next ten years when China is expected to have 2,200 ha. In most fields, the planting density is very high with 0.3 to 0.4 m between plants and 1 m between rows. Fields are commonly flood irrigated. Average yield is 7.5 to 38 t ha⁻¹ with all fruit hand picked at a cost of about \$0.22 kg⁻¹. In all production regions, except Nanjing Province, canes are buried in winter to avoid cold injury. Most of the production in China is processed with 70% of processed fruit and 10% of their fresh production exported.

Oceania

Most of the blackberry area in Oceania (Table 1) is planted in New Zealand which had 259 ha and 3,350 tons in 2005. Area in Oceania is projected to grow by about 35% in 10 years. The fruiting season in New Zealand is from November through April with almost all of their blackberry production consisting of trailing types, mainly 'Boysen'. Almost all of their production is processed with 55% of that exported.

Africa

South Africa was the only country in 2005 reporting commercial blackberry production with 100 ha (Table 1). About 60% of their area was planted to 'Young' trailing blackberry which was all processed and 60% exported. 'Hull Thornless', 'Loch Ness', 'Choctaw' and 'Arapaho' were grown also with 50% of their production being marketed fresh. However, no fresh fruit were exported due to distance to major markets of Europe. They report problems with plant importation due to phytosanitary restrictions and the need for cultivars that are firmer for long-distance shipping. They will try to produce the new primocane-fruiting types in South Africa.

There were 2,528 ha of organic blackberry production reported in the world in 2005: 1,550 ha in Costa Rica, 893 ha in South America (most in Ecuador), 73 ha in North America (most in the USA), and 11 ha in Europe. Use of tunnel production was reported on 315 ha worldwide with tunnels mostly being used to protect against adverse weather (150 ha in Mexico; 20 ha in Oregon and 12 ha in Washington, USA). Tunnels or greenhouses to advance or delay the fruiting season in addition to protection against the elements were used in Spain (50 ha), The Netherlands and Italy (20 ha each), Romania (10 ha), and South Africa (10 ha). The use of tunnels is expected to increase, particularly in Mexico and Oregon and Washington, USA.

Cultivars

Respondents reported the cultivars grown on 15,412 ha of the 20,035 ha of blackberries grown worldwide. On this reported area, 50% of the cultivars were semi-erect, 25% erect, and 25% trailing types in 2005. 'Thornfree', 'Loch Ness', and 'Chester Thornless' accounted for 58% of the semi-erect blackberry area and 'Dirksen', 'Hull Thornless', and 'Smooth Stem' for 28%. The only other cultivar grown on more than 5% of the worldwide semi-erect area was 'Čačanska Bestrna'.

'Brazos' was by far the most common erect blackberry grown worldwide accounting for 46% of the erect area. Other cultivars accounting for 5% or more of the erect area planted were 'Tupy' (18%), 'Navaho' (9%), 'Kiowa' (5%), and 'Cherokee' (5%). 'Marion' is the most important trailing blackberry grown accounting for 51% of the worldwide area of trailing types; more than 90% of the worldwide 'Marion' area is located in Oregon, USA. 'Boysen' accounted for 24%, 'Thornless Evergreen' 9%, and 'Silvan' 5% of the worldwide area of trailing blackberry.

CONCLUSIONS

Worldwide blackberry area increased from 13,958 ha in 1995 to 20,036 ha in 2005, a 44% increase. Most of growth in the last ten years occurred in Mexico, the USA, China, and Costa Rica (Fig. 1). Projections for the greatest growth in the next ten years are in Romania (900%), Poland (200%), Mexico (117%), Chile (76%), China (50%),

China (42%), and the USA (20%). Based on this survey, there may be 27,032 ha of commercial blackberries worldwide, not including production from harvested wild plants, in 2015.

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Tables

Table 1. Worldwide area and production of blackberries, 2005.

Region	Area planted (ha)	Production (t)
Europe	7692	43000
North America	7159	59123
Central America	1640	1590
South America	1597	6380
Asia	1550	26350
Oceania	297	3650
Africa	100	200
World Total	20035	140292

Table 2. Countries, by region, that reported from 1 to 99 ha of planted blackberries in 2005.

Region/Country	Area planted (ha)	1995–2005 (%)	2005–2010 (%)
<i>Europe</i>			
Austria	20	0	0
Belgium	5	0	0
France	30	200	0
Ireland	10	20	100
Italy	26	28	92
Spain	55	450	0
Switzerland	35	0	0
The Netherlands	21	5	0
<i>North America</i>			
Canada	41	36	67
<i>Central America</i>			
Guatemala	90	-63	33
<i>South America</i>			
Argentina	35	106	49
Peru	2	1900	650
Uruguay	9	100	0
Venezuela	1	0	200
<i>Oceania</i>			
Australia	38	90	32

Figures

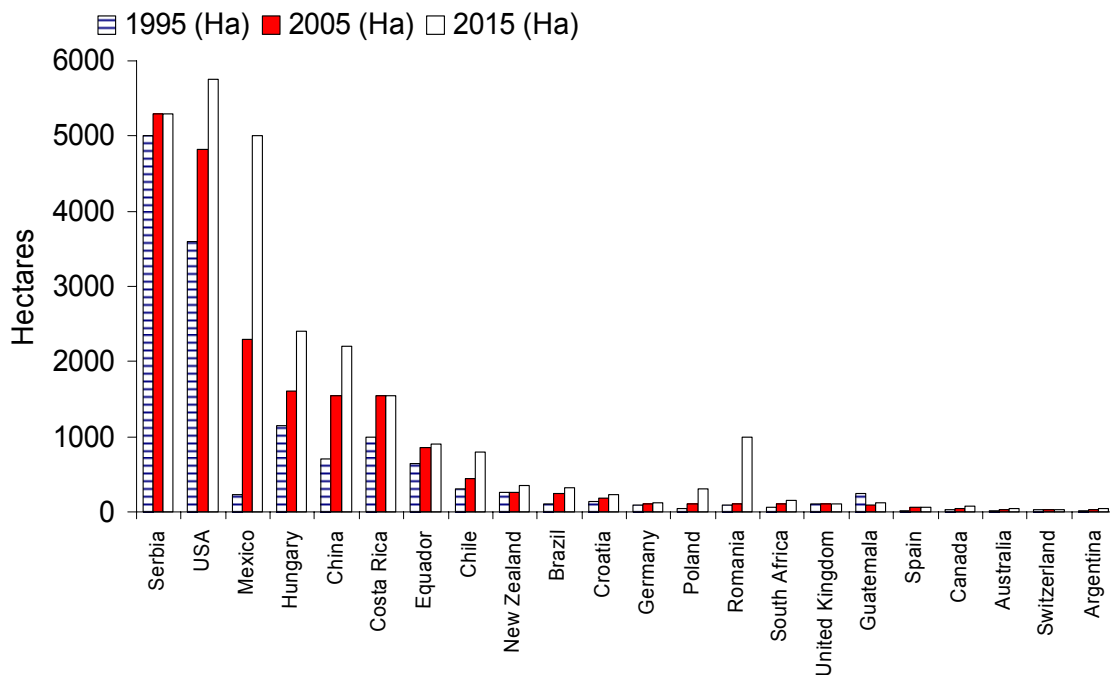


Fig. 1. Worldwide cultivated blackberry area, 1995, 2005, and 2015 (projected).

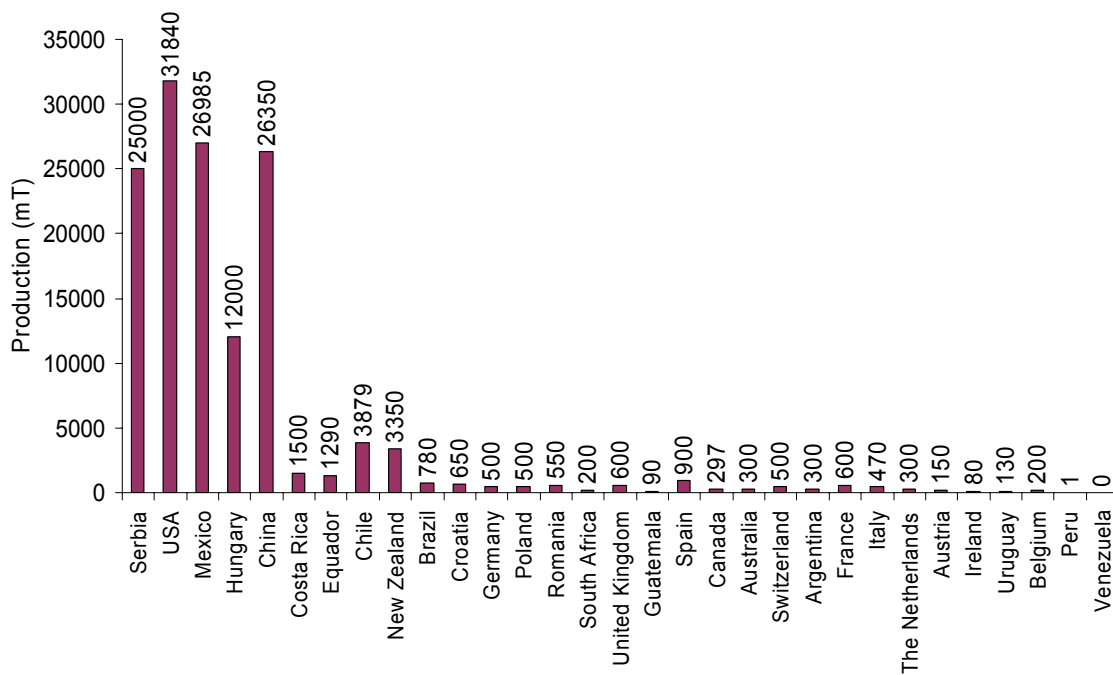


Fig. 2. Worldwide cultivated blackberry production, 2005.

