Crop Innovation and Business
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Blackberry market trends and innovation needs

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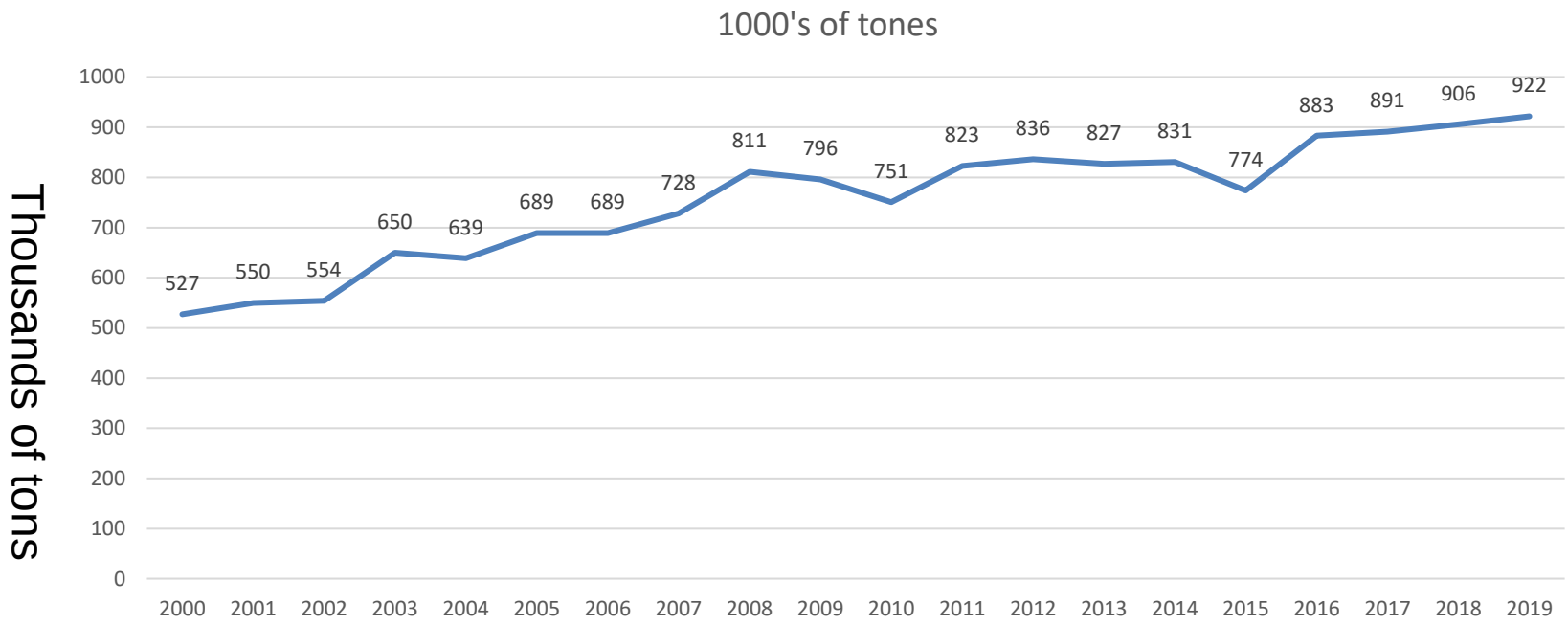
1. Market Overview
2. World Production
3. Main Production Countries
4. Mexican Production Market
    a) Potential Market
    b) Limiting Factors
5. Innovation needs

Importance of Berries

- Berries represent 20.5% of total fresh fruit
- Strawberries have one of the highest rates of consumption growth of all fresh fruit and vegetables.
- The per capita consumption of blueberries increased by 600.0% in the past 20 years.
- In the US market, 44.9% were for strawberries, 29.0% for blueberries, 14.4% for raspberries, **8.8% for blackberries.**

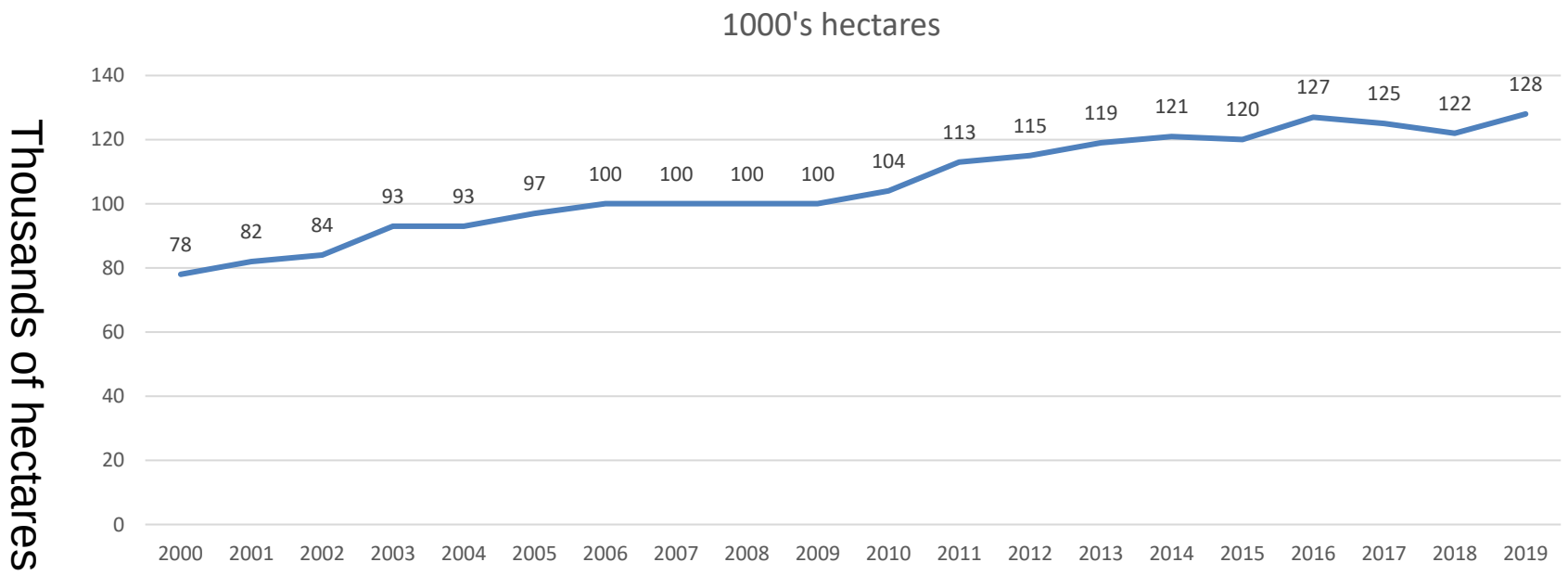
Market Overview



The world production of blackberry reached its maximum in 2019 with an average annual growth of 3.4%

Source: FAOSTAT

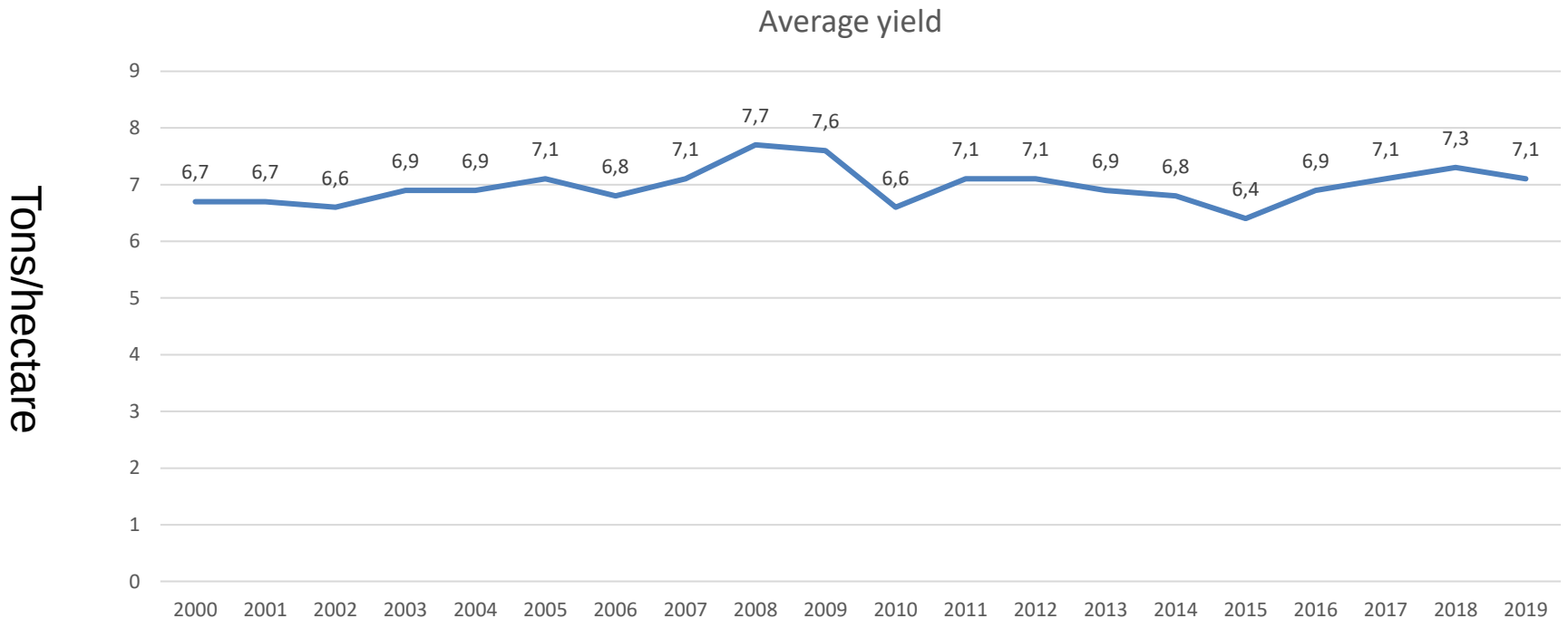
Market Overview



The world growing area of blackberry grew 4.5% average from 2000 to 2019. Most of these growing areas are in open field and in the ground

Source: FAOSTAT

Market Overview

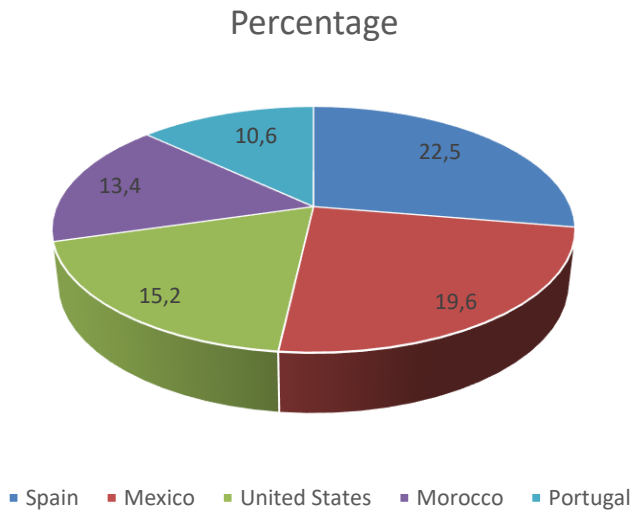


Yield remained relatively stable

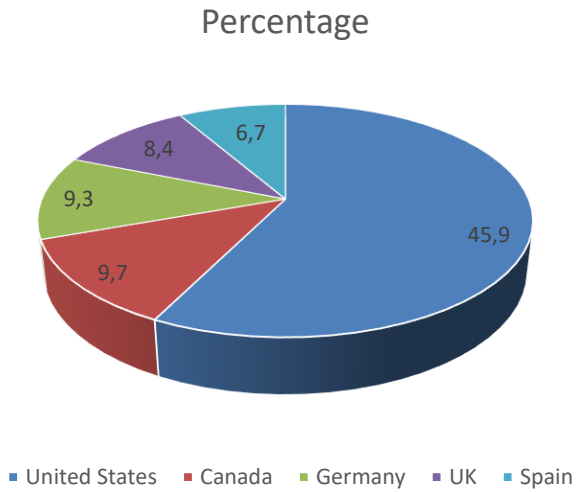
Source: FAOSTAT

Main producers (exporters) and consumers (Importers) countries

Source: TRIDGE



Main Producers and Exporters Countries



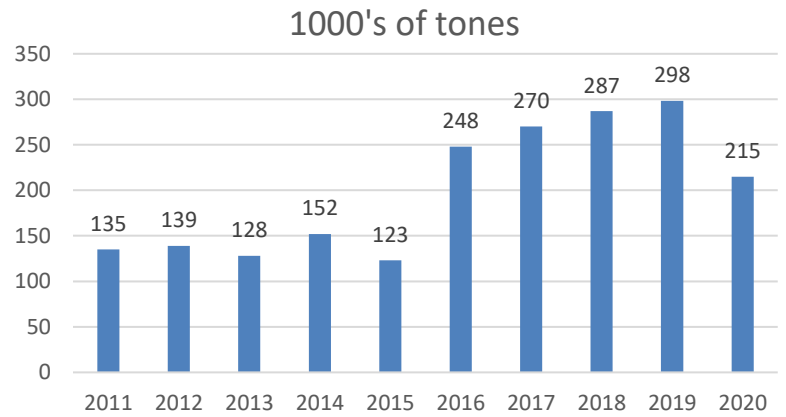
Main importers countries

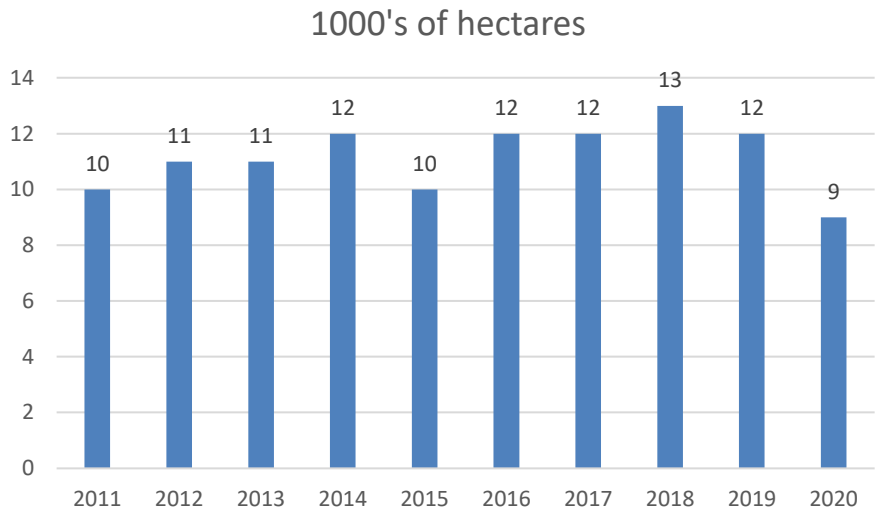
Mexico is the second largest producer of blackberries.

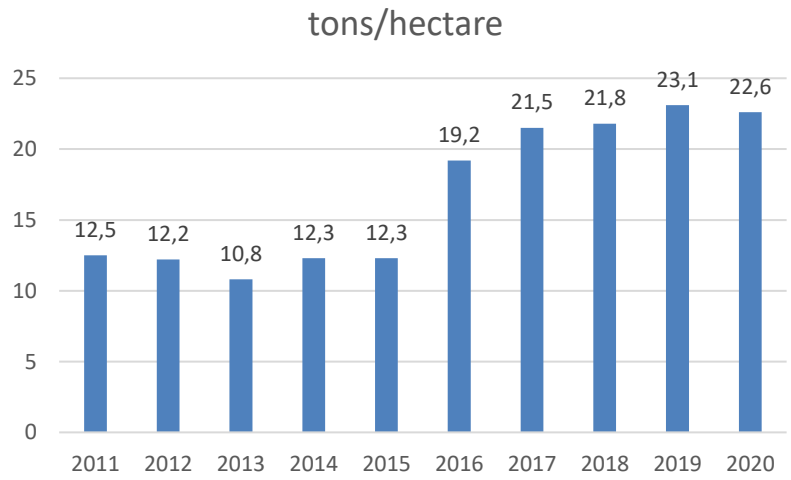
Almost all productions goes to United States

Mexico represents the highest potential growth in blackberries

Main growing states				
State	Production (tons)	# Hectares	Average yield (t/ha)	Value (mdp)
Michoacan	101,346	8,521	23.6	7,567
Jalisco	10,853	732	14.8	207
Baja California	887	56	15.8	96
Colima	1,922	89	12.6	76
Others	900	77	8.8	25







Breeding targets in Blackberries

- Yield Increase
- Harvest Flexibility (year-round supply)
- Reduce Production Cost (crop management)
- Shelf Life (color reversion)
- Fruit quality (flavor, color, shape)
- Thornless
- Pest and Disease Resistance
  - Fusarium, Rhizoctonia, Phytophthora, Downey mildew
  - Mites, Thrips
- Drought and Salt Tolerance
- Increase Harvest Efficiency- Labor availability

Plant Breeding is highly traditional in Berries

- Both private and public breeding programs are done by crossing hybrids by hybrids
  - No parental lines are developed
- Selected plants are clonally reproduced and selected after several years of testing
- Little use of Molecular Markers as breeding tools
- From all berries, blackberries are the least investigated
  - Exceptions of Driscoll's, University of Arkansas, and Oregon State among the most important programs

Types of Blackberry Plants

High Chill varieties- Lochness

Low Chill varieties- Tupy

Spiney

Spineless

BLACKBERRY

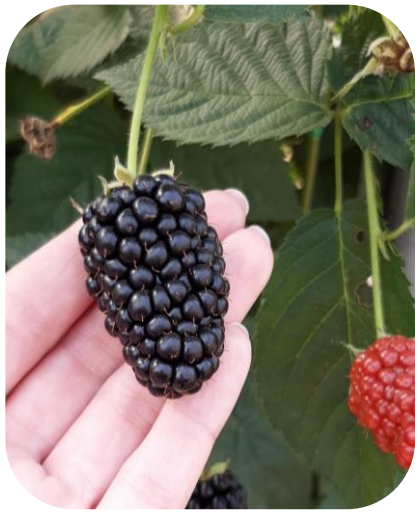
FLORICANE

Floricane varieties still need some chilling to be grown productively or be induced through some managing practices such as defoliation or growth regulators

BLACKBERRY

PRIMOCANE






Primocanes do not need chill to be able to grow and produce fruit at any time of the year.
No need for defoliation or growth regulators

Breeding Challenges

- Most important traits are multigenic and recessive
- Limited Public Research
- Long time to develop new materials
  - 10 to 12 years to develop a new variety
- Genomic Selection still very low
- Phenotyping is the most important bottle neck
  - Expensive
  - Laborious
  - Qualitative and highly subjective

What are we looking at to advance our breeding targets faster?

Affordable and reliable breeding tools

- ***Marker Assisted Selection***
  - However, most of the major traits in blackberries are **complex and involve many loci of small effect** that may interact with each other as well as with environment.
- ***Genomic Selection***
  - Use GWAS markers to estimate the effects of all loci and **predict the genetic values** of untested populations.
- ***More precise phenotyping tools***
  - Advanced sensor, machine vision, and automation technology
  - High Throughput Phenotyping

Progress in both genotyping, IT and Phenotyping tools have increased a lot in past decade, however, they are still expensive and not high reliable

Planasa

INNOVATION IN PLANT VARIETIES

THANK YOU