

Saffron:

A Good Fit for New England

Margaret Skinner, Bruce L. Parker
& Arash Ghalehbolabbehbahani

North American Center for Saffron Research & Development
University of Vermont



What is Saffron?

Crocus sativus (=cultivated)

- The most expensive spice in the world
over **\$3,000-9,000/lb!**
- Origin: Probably Greece or Crete
- Flowering: autumn
- Reproduction: Corm
- In cultivation for over 3,500 yr



Why grow **SAFFRON** in the Northeast?

Over 90% of farms in the Northeast are ranked as "Small".

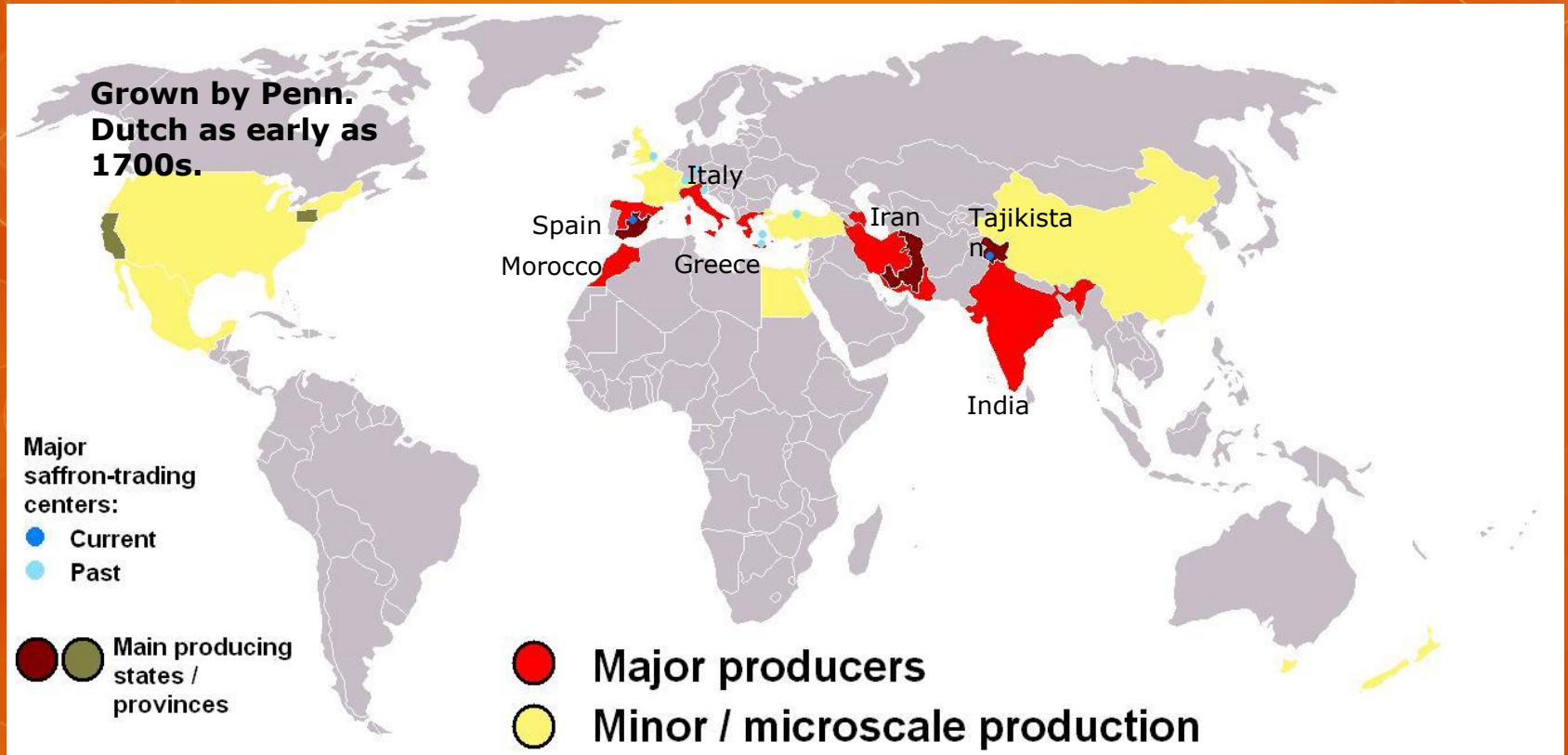
- 40 acres are lost to development every hour in the US.
- 42% of all developed land in the US is in the East.
- **Crop diversification is key to success for small farms.**

What is Saffron good for?

- Culinary spice
- Medicinal herb
- Medicinal extract
- Perfume
- Ornamental plant
- Fabric dye
- Liqueur



Where is Saffron Grown?



In 2016 the US imported **46 tons** of saffron!
Imports are estimated to **triple** by 2025.

Why is Saffron so expensive?

Currently most harvesting is done by hand.

One acre (field-grown) in Iran produces about three pounds of saffron.



Why is Saffron so expensive?

Currently all processing is done by hand.

4,000 blooms = 1 oz of saffron



Potential of Saffron for Diversified Farmers

- High value crop with long shelf life
- Low input (except harvesting & processing)
- Production is relatively simple
- Most labor outputs are for 4 weeks in Oct./Nov.
- Fits into traditional vegetable production cycle
- Lots of possible value-added products



Saffron honey



Saffron flavored oil

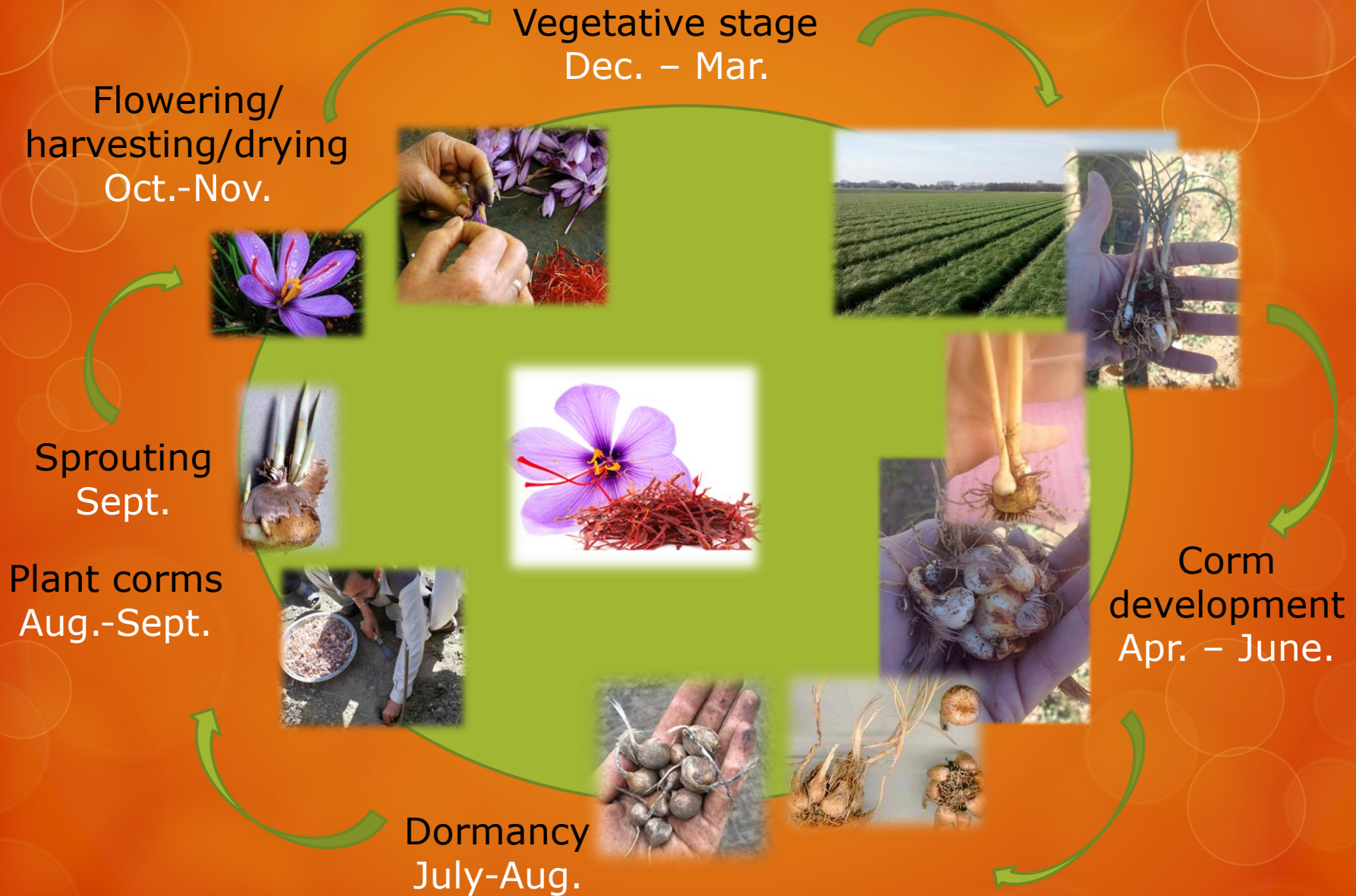


Saffron flavored syrup



Saffron safes

Saffron Production Cycle



Where can Saffron be grown commercially in New England?



Zones 4-5?



Zones 6-7?

Our Hypothesis:

In high tunnels in colder zones
In the field in warmer zones

High Tunnel Growing Methods Tested 2015-2016



Raised beds



Milk crates



Why High Tunnels?



- Low cost to erect and operate
- Protected environment but not too hot
- Used for other traditional crops



Why Milk Crates?



- ✓ Easy to move so growers can start other high-value crops like tomatoes in spring
- ✓ Inexpensive (often free) and readily available
- ✓ Suitable depth for growing saffron
- ✓ Light weight but sturdy and durable
- ✓ Protect corms from rodent predation

Production Methods

Source of Corms: PA (2015); Holland (2016)

Corm size: 9-10 cm circumference

Planting date: Aug. 25-Sept. 1

Irrigation: top watering



MILK CRATES

- ✓ Milk crates (11 in. tall) covered inside with 2 strips of weed cloth.
- ✓ Crate filled with 4 in. top soil.
- ✓ Corms placed tip end up on top soil, covered with 2 in. of top soil and 4 in. perennial potting mix with compost.
- ✓ 11 corms planted/crate (=118 corms/m²)

Production Methods

RAISED BEDS

- ✓ Raised beds (12 in. tall), bottom covered with hardware cloth (2016 only)
- ✓ Corms planted 2 in. deep in top soil covered with 4 in potting mix
- ✓ Planting density: 118 corms/m²

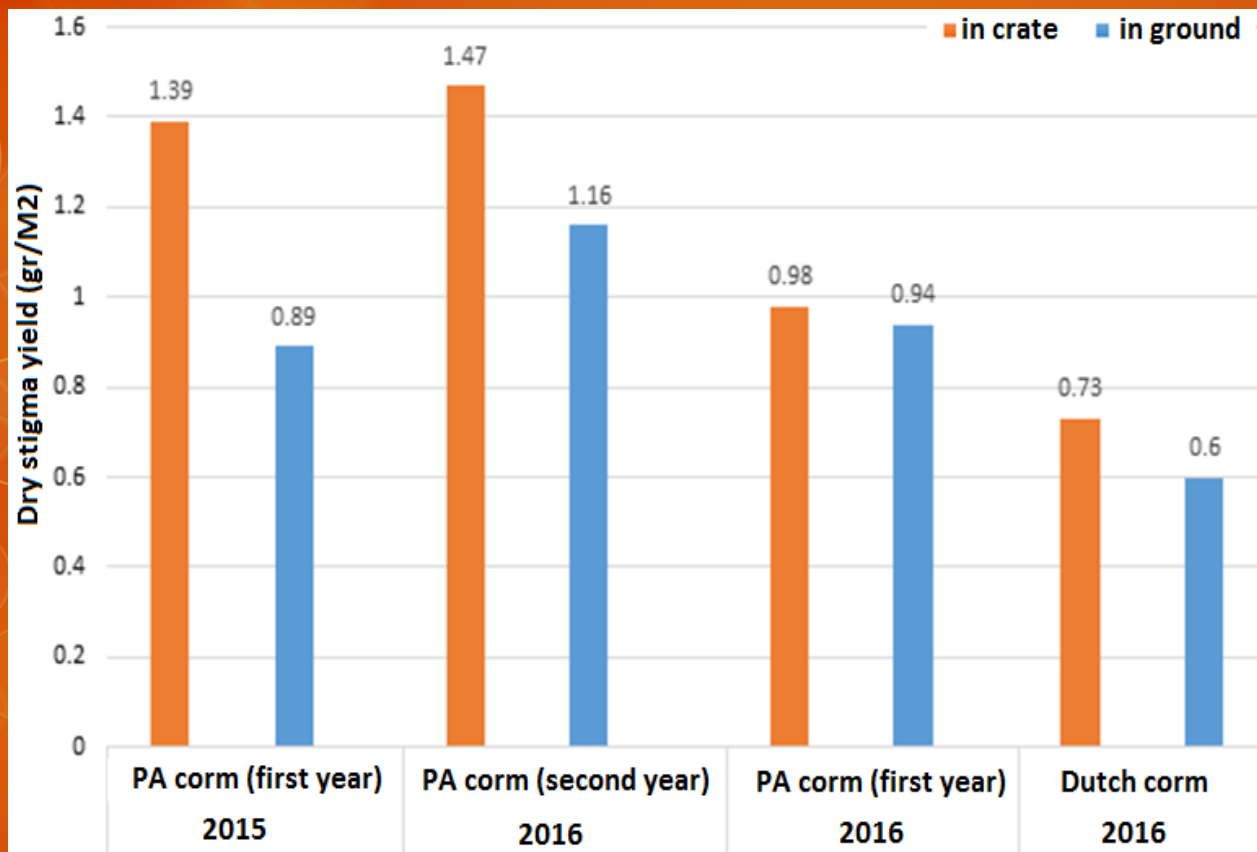


Harvesting and Drying Methods

Harvest Period ~35 days: October 12-November 20

- ✓ Harvested by hand every 2 days.
- ✓ Stigmas, stamens and petals separated and dried.
- ✓ Fresh and dry weight of each part recorded.
- ✓ Drying methods tested:
 - Air dried
 - Oven dried





Stigma Yield

- Greater yield in crates than in raised beds (rodent damage)
- Yield increased in Year 2
- Our estimated saffron net revenue = \$4.03 – 5.25/ft²
- Estimated yield/acre: 5,624 gr [12.6 lb] = \$112,480
- Greater yield than Iran (0.34 gr/m²) and Spain (0.60 gr/m²)
- **Greater revenue per sq ft than tomatoes (\$3.51) or winter greens (\$1.81)**

All that Glitters is NOT Gold!

Mexican Saffron is not the real thing.

It is safflower (*Carthamus tinctorius*), a frequent filler or fraudulent product.



Saffron is the most frequently adulterated spice in the world.



Summary

- Saffron **yield higher in crates** than in raised beds.
- Saffron **yield greater in high tunnels** than in fields in Iran and Spain.
- In 2015 saffron **quality similar** to other products.
- **Corm yield greater in crates** than raised beds. Rodent damage and water availability were factors.
- **Corm size and weight greater in raised beds** than in crates.
- **Revenue from saffron greater** than tomatoes or winter greens.

Current Research & Outreach

- Field production in different VT coldhardiness zones.
- Compare saffron yield over time (years).
- Assess saffron quality relative to coldhardiness zones.
- Test different ways to minimize rodent and bulb mite damage.
- Workshop in March 2018.
- Moderate Saffronnet (internet listserv).



Future Research if we get Funding

- Field vs high tunnel vs low tunnel production in different coldhardiness zones.
- Market analysis and production cost study.
- Determine factors affecting saffron quality.



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