A few perspectives and outlook on hemp

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Key points, and so I have heard it said...

• Hemp as a legislated crop
• World’s newly invigorated commodity
• Status of the industry, Oregon as an example
• Research needs
• OSU Global Hemp Innovation Center
Hemp and regulatory stability

Hemp

Marijuana

≤ 0.3% delta 9-THC

> 0.3% delta-9 THC

U.S. Domestic Hemp Production Program

The 2018 Farm Bill (pdf) directed USDA to establish a national regulatory framework for hemp production in the United States. USDA established the U.S. Domestic Hemp Production Program through an interim final rule. This rule outlines provisions for the USDA to approve plans submitted by States and Indian Tribes for the domestic production of hemp. It also establishes a Federal plan for producers in States or territories of Indian tribes that do not have their own USDA-approved plan.

NOTE: This document is a draft version of the interim final rule provided as a courtesy. The official publication of the interim final rule in the Federal Register may include changes from this version. The effective date of the interim final rule is, and the comment period will not begin until, the date of publication in the Federal Register.
Hemp, in a time capsule since 1936

Hemp missed:

- 20th Century technology advances
- Green revolution
- Market and trade developments
- Risk mitigation instruments

Agricultural productivity index

Output

Input

2014 Farm Bill

2015 2030
Kinds of hemp crops and products

Hemp Crops

Grain
- Hulling
  - Meat (Food)
  - Shell (Flour)
- Pressing/Crushing
  - Oil (Food, Fuel, Paint)
  - Cake (Food, Beer, Feed, Chem)

Flowers
- Harvest
  - Smokables
- Extraction
  - Pharma
  - Spend Biomass
  - Livestock Feed

Intermediate processing

Further processing

Stalks
- Decortication
  - Fiber
  - Hurds
    - Fiber board
    - Compost
    - Mortar
    - Paper filler
    - Absorbent
    - Bedding
    - Chemical feedstocks
    - Plastics
    - Paint
    - Sealant

Harvest

These are driving the present Oregon market

This is slowing the market
Growing pains, a diverse industry by all measures

- Growers and rest of sector participants from all walks of life
- 63,000 registered acres in 2019, and 1,940 registered growers in the state
- Crop is being grown for hemp essential oils using feminized seeds
- Need for dependable, functional, connected value chain components
Look for competitive advantages

- Low state legal barriers
- Robust genetics are available
- Natural products experience
- Naturally productive environment
- High-value agriculture experience
- Existing infrastructure to leverage
- Entrepreneurial business attitude
Hemp is a commodity in need of...

- Prices set by efficient markets
- Established market standards
- Tracking of production, costs, and returns
- Investments in supply chain infrastructure and innovation
- Science-based decision-making
Discovering the optimal place for hemp

Oregon hemp essential oil yields:
- 2.2 x Colorado
- 1.9 x Kentucky

Environment x Genetic x Management effects

Cannabidiol

Fibers
Grain and Oil
Present system scaled from marijuana production

Seeds → Vegetable transplanter → Established field
Research new systems and mechanization
Systems to solve larger sustainability challenges

Existing crops
- Potatoes
- Alfalfa

Hemp as a substitution crop
- Hemp

Gross farm income
- Hemp as a substitution

Production region as a system
- Nutrient management

Available water
- Natural resources management

Complementary rotation effect
- Old crop acreage
- Gross farm income

Time
Global Hemp Innovation Center

Formalized university-wide center in June 2019
All OSU colleges involved
• 50+ faculty; 25+ disciplines
Industry-focus, implementing a Research Consortium Model
Global Hemp Innovation Center

World-wide reach: more than 40 agreements world-wide
• Organized by industry sectors
• Guides R&D by scholars
• Private-public shared goal setting
• Access to GHIC global partner network
• Tiered membership, research sponsorship, and access to discoveries
Industry sector organization

Agricultural production
Plant genetics and breeding
Harvest and post-harvest processes and manufacture
Animal health and nutrition
Human health

Engineering
Chemistry, Chemical engineering
Fiber and Textiles
Digital architecture and construction
Business and marketing
Cannabis lab standards, Certification
New opportunities for international trade

• Establish international hemp testing protocols - B2B compliance with standard measures
• Set up international trade protocols - for import-export markets
• Develop hemp commodity and product exchanges