THE 'INS' AND 'OUTS' OF ORGANIC WALNUT PRODUCTION

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Let’s hear from you!

- What are you experiences?
- What changes have you noted in production and/or marketing?
- What changes to you foresee?
- WOULD YOU DECIDE TO TRANSITION AGAIN IF NOT ALREADY CERTIFIED?

MARKETING IS IMPORTANT!

Prices higher vs. conventional but as supply up, prices may decrease

PROCESSORS certified as well: FSMA, specialized markets/sales

NOT FOCUS OF THIS TALK

Organic Walnut Production Statistics

(2012 Ag Census; 2014 Organic Survey; Ag Commissioner estimates)

Statistics hard to find! Acreage reporting not required!

- CA: 195 farms (95), 5750 acres (99), 5340 (93) tons (.93 T/A), 23.3m$ ($4,050/A)

  Major counties (A): Lake (1700), San Luis Obispo (650), San Benito (564), Solano/Yolo (2000?), remaining: Central Valley, Sierra Foothills (data not broken out)

- Other states: IL, MT, NY, OR, PA, WA, WI

  (1-3 farms each, <$5K each)

Costs and Returns

optimal where pest management inputs minimized

- *2013 Lake*
  https://coststudyfiles.ucdavis.edu/uploads/cs_public/f1/ce/f1ce757f-c350-482c-a4fb-89657da2b07a/walnut_org_nc2013.pdf
- *2007 Lake*
  https://coststudyfiles.ucdavis.edu/uploads/cs_public/54/3b/543bdaa1-eba6-4876-a8e2-ff946e566901/walnutorgnc2007.pdf
- *1994 Sacramento Valley*
  https://coststudyfiles.ucdavis.edu/uploads/cs_public/a1/f6/a1f6212e-671c-45d9-a728-fa6ab5a038ac/94orgwalnuts.pdf

KEY = YOUR FARM PLAN

(Organic Systems Plan)

- Anticipate material needs, products
- Certifier must approve
- Report changes to certifier immediately for approval
- Certifiers can approve materials regardless of OMRI or WSDA

USDA National Organic Standards Program Manual

https://www.ccof.org/sites/default/files/media_files/documents/CCOF%20USDA%20NOP%20Standards%20Manual%20July%202017.pdf

(informational only; check other certifier websites as well)

THE RULES

- USDA National Organic Program
  - https://www.ams.usda.gov/about-ams/programs-offices/national-organic-program
- California Dept. of Food and Agriculture Organic Program (product/producer registration)
  - https://www.cdfa.ca.gov/is/i_%26_c/organic.html
- Ag Commissioners – handle/enforce CDFA program; publish statistics; may certify.

THE LISTS
IMPORTANT WEBSITES:

- NOP generic (active ingredients)
  - See USDA NOP
- EPA Inert (other) Pesticides Ingredients
  - http://www.epa.gov/opprd001/inerts/lists.html
- Organic Materials Review Institute (OMRI)
  - http://www.omri.org
- WA State Dept. of Agriculture
  - http://agr.wa.gov/FoodAnimal/Organic

USDA/NOP: The Original Basic List (http://www.ams.usda.gov/rules-regulations/organic/national-list)

Allows use of all natural substances unless specifically prohibited

- Generic
- Active ingredients only

EPA: ENTER THE INERTS (aka "other ingredients")

NO!

List 1 Known Toxicological Concern

List 2 Potentially Toxic

List 3 Unknown Toxicity except passive pheromone dispensers

YES!

List 4A Minimal Risk

List 4B Reasonable to conclude no adverse effect on health or environment

NOP & EPA COME TOGETHER HERE:

- Organic Material Review Institute (OMRI)
- WA State Dept. of Agriculture (WSDA)
  - Registrants submit (pay fee)
  - Product evaluated
  - Decision made to list/not list
  - *Recommend* to certifiers (WSDA is also a certifier)
  - NOT REGULATORY
  - DOES NOT = REGISTRATION IN CALIFORNIA!

Certifiers:

YOUR VERY IMPORTANT PARTNER

https://www.cdfa.ca.gov/is/docs/CertifiersList.pdf

- Which lists (if any) do they rely on?
- Do they self-evaluate materials?
- How quickly do they inform you when the status of a material in your farm plan changes?

Example **of certifier requirement:**

"Please be aware that you cannot use any input material in your organic production until it has been:

Listed by OMRI/ WSDA **AND** added to your OSP Materials List by CCOF, ***or***

Submitted **AND** approved by CCOF, and added to your OSP Materials List. Use the CCOF Material Review Request Form."

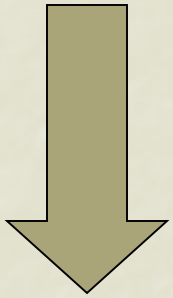
From: California Certified Organic Growers website, *www.ccof.org*.

CERTIFIERS ARE NOT PCAs

- PCAs recommend a treatment
- CERTIFIERS approve a material

MAKE SURE YOU *ALL* COMMUNICATE!

International



A whole different ballgame
(talk with your certifier)

Establishing the Orchard

- Choose site and cultivar carefully!

- *SUGGESTION:* Begin w/standard practices, then transition to organic. WHY?

DIFFICULT TO ESTABLISH ORGANICALLY:
nursery stock**,** pre-plant prep, nutrition (N, P, Zn), weed control, sunburn protection (paint), vertebrate control


FORD

901 PAYNE

02 PAYNE

903 PAYNE

904 PAYNE – NO WHF

905 PAYNE – 100% WHF

906 SERR

9CERR

ERR

909 HARTLEY

910 HARTLEY – EARLY HAR


PEPSI

Considerations and Cautions

sparse published research

NOT* Recommendations! ONLY *Allowable!

- Watch phytotoxicity!
- Watch food safety (FSMA)!

- **Check with your buyer** before deciding to apply anything!

Buffer zone: An area located between a certified production operation or portion of a production operation and an adjacent land area that is not maintained under organic management. A buffer zone must be sufficient in size or other features (e.g., windbreaks or a diversion ditch) to prevent the possibility of unintended contact by prohibited substances applied to adjacent land areas with an area that is part of a certified operation.

Manure, Compost, Cover Crops

KEY SOIL BUILDING INPUTS

Compost / tea / mushroom waste **–** ***prohibited*****:** raw manure (same as uncomposted manure rules), sewage sludge, synthetically fortified compost starter, glossy paper, colored ink.

Cannot contaminate crops, soil, or water w/plant nutrients, pathogenic organisms, heavy metals, prohibited substance residues.

Raw manure (*check with buyer!*)

Edible product touches soil: Incorporate into the soil ***no less*** **than 120 days prior** to harvest (verified during annual inspection); ***strongly discouraged due to food safety risk!***

Compost (*encouraged but not required!*)

Manure-based - produced according to NOP regulations in order to be considered compost (i.e. temperature and duration varies with static and windrow piles)

Plant-based - considered mulch and are generally not subject to restrictions on their use or production.

General Nutrition Suggestions

- **Walnuts require N** – *don't skimp!* BIGGEST DEFICIENCY SEEN for growth and yield
- Attention to micronutrients – esp. Zn; watch salt build up in drought (non-synthetic trace elements)
- Compost is an amendment; need LOTS; ***start heavy***, reduce to maintain; buy only from reputable sources.
- Manure: food safety, contamination, salt
- Heavier N products: alfalfa/poultry manure pellets, well-rotted manures, feather meal
- **Cover crops:** *need water to establish/maintain*. Can compete with (young) trees for water/nutrients
- Organic blended fertilizers – very low %, often expensive

Mined Fertilizer Materials

(low solubility – allowable; highly soluble - restricted – *check!*)

"Must not have undergone and change in its molecular structure through heating or combining with molecular substances"

Low: limestone/dolomite, gypsum, borax, rock phosphate, rock potassium (rock powder, potash, magnesium (rock, Epson salts), elemental sulfur, perlite, trace minerals

High: Chilean (sodium) nitrate (16-0-0): *ONLY* ≤20% of N needs; potassium chloride/muriate of potash (KCl); calcium chloride

Plant-based Fertilizer and Incorporated Soil Amendments

Alfalfa (meal/pellets), algae/aquatic plants (seaweed/kelp), ash, cannery waste/water, coffee grounds, pomace, activated charcoal, wood ash (unpainted/untreated), seed meals, gin trash, crop residues, peat moss

CHECK WITH YOUR CERTIFIER!

Animal-based Fertilizers and Incorporated Amendments

- By-products/waste (meat, bone/blood meal, urine, ash, feather meal, fur/hair/wool, hoof/horn meal, tankage)
- Milk (liquid/dry
- Fish/crustacean – many types, ground shells
- Bat/bird guano (decomposed/dried)
- Worms/castings (fecal coliform, salmonella)

Allowable Insect Controls
(many *Restricted – check!*)

- Sticky traps, ammonium carbonate, bio-pesticides, natural acids, biological agents (non-regulated), neem-based products (check!), BT, clays (bentonite, kaolin), borate (mined), boric acid, botanical-derived pesticides (e.g. limonene, ryania, sabadilla), microbial pesticides, diatomaceous earth, petroleum-based narrow-range (dormant) oil, animal (fish)/plant-based horticultural oils (also as spreader stickers), fermentation by-products (e.g. spinosad), insect extracts, lime sulfur, pheromones (List 3,4 inerts), pyrethrum (NOT w/PPB), rotenone, fatty acid soaps
- Molasses – *fertilizer:* OMRI
- Snails/slugs: spinosad bait, iron phosphate, traps

UC IPM GUIDELINES FOR WALNUTS

RELY HEAVILY ON BIOLOGICAL CONTROL = *HABITAT*

APHIDS

BIOLOGICAL CONTROLS, OILS TO SUPPRESS

EUROPEAN RED MITE

BIOLOGICAL CONTROL, NARROW RANGE OILS

***CODLING MOTH* – (research on *BATS* to consume moths – Rachael Long)**

ORGANICALLY APPROVED INSECTICIDES, PHEROMONE MATING DISRUPTION. OIL WILL KILL 30–40% OF EGGS BUT PHYTOTOXICITY IS OF CONCERN, ESPECIALLY WHEN WEATHER IS HOT, AND CAN KILL THE WALNUT APHID PARASITE, *TRIOXYS PALLIDUS*.

FALL WEBWORM

Bacillus thuringiensis

UC IPM GUIDELINES FOR WALNUTS

SAN JOSE SCALE

BIOLOGICAL CONTROL AND SPRAYS OF CERTAIN NARROW RANGE OILS

WALNUT HUSK FLY

SPINOSAD: GF-120 , ENTRUST (W/ BAIT)

WALNUT SCALE

BIOLOGICAL CONTROL, NARROW RANGE OILS

WEBSPINNING SPIDER MITES

MINIMIZE DUST, MAINTAIN GROUND COVER, MINIMIZE STRESS. PROMOTE NATURAL ENEMIES, NARROW RANGE OILS

UC IPM GUIDELINES FOR WALNUTS

FROSTED SCALE AND EUROPEAN FRUIT LECANIUM

BIOLOGICAL CONTROL, NARROW RANGE OILS

ITALIAN PEAR SCALE

REMOVE MOSS AND LICHEN OR TREAT THEM WITH BORDEAUX. Not all copper compounds are organically acceptable, so be sure to check the label of the product used.

NAVEL ORANGEWORM

BIOLOGICAL AND CULTURAL CONTROL

REDHUMPED CATERPILLAR

BIOLOGICAL CONTROL AND SPRAYS OF *BACILLUS THURINGIENSIS*

"Allowable Disease" and Nematode Controls (pre- &/or post-plant)

- Fermentation products (e.g. *Streptomyces* (Actinovate, Sequestrene; *Myrothecium* (DiTera)
- Fixed copper – many types (check label!); Bordeaux; WATCH *RESISTANCE!*
- Calcium polysulfide (lime sulfur)
- Galltrol-A® for crown gall (WSDA)
- NEED WORK ON FUNGAL DISEASES, i.e. *Botraeosphaeria, Phytophthora; this is greatest gap for organics.*

Allowable Weed Control

- Classical biological: arthropods, pathogens
- Botanical pesticides: corn gluten (non-GMO),
- Vitamin B1 (?)
- Non-synthetic herbicides, e.g. fatty acid-based
- Mulches/row covers: non-synthetic; synthetic – *remove at end of season*; *cannot decompose* in field. *No* polyvinyl chloride, glossy/colored paper
- Pesticidal soaps
- Acetic acid (vinegar)
- Fatty acid herbicides

Allowable Rodent Controls

SQUIRRELS! (see buffer zones)

- Vitamin D3 (cholecalciferol)
- Repellent products, e.g. cayenne pepper, garlic, rotten eggs, hair, blood meal, predator scents
- Mechanical traps (w/out baits)
- Ammonium soaps
- Birds of prey

Allowable Inerts/Adjuvants/PGRS/MISC.

- Sulfuric acid
- Plant/animal-based oils
- NO REGISTERED ETHYLENE PRODUCT TO PROMOTE MATURITY
- SUNBURN PROTECTION: Milk protein paint unlisted. Can use kaolin-based,e.g. Surround®

Organic Walnut Production

- ***NOT*** "ORGANIC BY NEGLECT"!
- Requires long-term planning and inputs
- May be more, or less, expensive than conventional
- Has enabled "fringe" growing areas to thrive and is a stable market; *ASK YOUR BUYER BEFORE ADAPTING!*
- Drought will effect orchard floor management in some areas

THANK YOU!