

## Farmer Skill and Knowledge Checklist for Tree Fruit Growers in Maine

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Whether starting for the first time or in the tree fruit business for many years, this list is designed to guide growers in determining knowledge gaps and skills that may be gained to be more successful in tree fruit production. The list is comprised of many knowledge areas involved in apple production as well as other tree fruits. The list is not intended to be comprehensive. Additional items to the list are appreciated.

**Circle your current and desired (target) competence using this scale:**

- 1=No knowledge/skill  
2=Some knowledge/skill  
3=Well-informed/experienced

Recommended knowledge	My current level			My target level		
<b>Know Your Tree Fruit Crop</b>						
Know that tree fruits that can be grown commercially in the various regions of Maine according to the length of the growing season and cold hardiness (USDA Cold Hardiness Zones 3 – 6).	1	2	3	1	2	3
Realize that varietal traits that are important in commercial production, both marketing and horticultural, i.e. consumer demand for the variety, selling price, bloom date, ripening season, biennial bearing, storability, disease resistance, unusual labor requirements.	1	2	3	1	2	3
Know the rootstocks (dwarfing, semi-dwarfing and standard), their recommended in-row spacing and how they affect labor and other production costs, yield and profitability.	1	2	3	1	2	3
Know the pollination timing and needs of fruit trees with respect to cross pollination and the need for honeybee hives or native insect pollinators.	1	2	3	1	2	3
Be able to distinguish the development, flowering and fruiting growth stages (see <a href="#">Resources</a> ) associated with important cultural practices, such as green tip and petal fall.	1	2	3	1	2	3
Able to distinguish flower buds from leaf buds so that one can gauge the potential size of the next crop.	1	2	3	1	2	3

Understand the effect of tree pruning on crop load and crop value.	1	2	3	1	2	3
Recognize the different tree training systems that increase yield and quality, and ease of pruning and harvest. Commonly used training systems are the central leader, vertical axe, tall spindle, open center, and quad V.	1	2	3	1	2	3
Be aware of the production guides for different tree fruit crops (see <a href="#">Resources</a> ).	1	2	3	1	2	3
<b>Farm Business Planning and Management</b>						
Able to select a suitable site for a farm business. A suitable site has access to customers and is located near storage facilities and markets if needed.	1	2	3	1	2	3
Be able to identify and locate reputable agricultural suppliers that offer the best price for materials and services (nurseries, trellising, irrigation, fertilizers, packing supplies, etc.).	1	2	3	1	2	3
Be familiar with tree quality terms such as caliper, whips and feathers, and how they affect tree cost and orchard establishment.	1	2	3	1	2	3
Be able to accurately estimate production costs and projected yields for a particular orchard. Know how your costs and yields compare with local averages.	1	2	3	1	2	3
Be able to calculate a profitable price for your produce and other products.	1	2	3	1	2	3
<b>Production</b>						
Be able to select a suitable site for an orchard. A suitable site is free of frost pockets, has access to irrigation water, adequate soil fertility and drainage. Hilly terrain should have a slope no greater than 8%.	1	2	3	1	2	3
Be aware of land preparation tasks such as rock and stump removal, tile drainage if needed, soil tests, amendments for soil pH and preplant fertilizer (potassium, phosphorous, zinc).	1	2	3	1	2	3
Be able to lay out a field for planting for ease of cultivation, i.e., varieties that bloom together, row spacing and orientation, height of the graft union above the soil.	1	2	3	1	2	3
Know tree planting know-how such as tree spacing, height of the graft union and post planting pruning	1	2	3	1	2	3
Be able to recognize the water needs of specific fruit crops and the different methods for measuring soil moisture.	1	2	3	1	2	3
Know how to calculate the cost-efficient irrigation systems for orchards and their installation.	1	2	3	1	2	3
Know the basic pruning techniques of heading, thinning and renewal cuts, and the tools that increase pruning efficiency.	1	2	3	1	2	3
Know how and when to prune tree and how much to remove in a season.	1	2	3	1	2	3
Know how to safely operate a chainsaw.	1	2	3	1	2	3
Know how to effectively use a telescoping pole saw.	1	2	3	1	2	3
Know when and <a href="#">how to harvest and store fruit crops</a> to minimize postharvest loss.	1	2	3	1	2	3

Soil & Fertilizers						
Know how to collect soil and leaf samples for fertility analysis.	1	2	3	1	2	3
Know how to interpret a leaf analysis.	1	2	3	1	2	3
Know <a href="#">how to select and use lime and fertilizers</a> effectively for tree fruit crops.	1	2	3	1	2	3
Understand the importance of soil drainage.	1	2	3	1	2	3
Be familiar with cultural practices to minimize soil erosion.	1	2	3	1	2	3
Be familiar with foliar fertilization for bitter pit prevention.	1	2	3	1	2	3
Be familiar with methods to change the soil pH to suit specific crops (increase / decrease).	1	2	3	1	2	3
Pest Management						
Know how to access and use the New England Tree Fruit Management Guide as well as other resources for integrated pest management (IPM).	1	2	3	1	2	3
Understand how pest and disease management impacts yield and ability to grow commercial quality fruit.	1	2	3	1	2	3
Be familiar with the <a href="#">major insect pests</a> and <a href="#">diseases</a> that damage fruit crops, how to recognize their damage and when control measures are typically implemented.	1	2	3	1	2	3
Know about the spray materials that are used to manage insect pests and diseases, and how to use them safely and legally.	1	2	3	1	2	3
Know where to pack and send plant insect and disease specimens for diagnosis.	1	2	3	1	2	3
Know how to identify common weeds of Maine orchards.	1	2	3	1	2	3
Know <a href="#">how to select herbicides</a> to use effectively control weeds in newly planted and in established orchards.	1	2	3	1	2	3
Know about the mulches that are recommended and those that are not for an orchard setting.	1	2	3	1	2	3
Know the different types of sprayers and which type is the best fit for your orchard (air blast, tower, wand, handgun, boom sprayer).	1	2	3	1	2	3
Know about spray nozzles, types, kinds, troubleshooting, etc.	1	2	3	1	2	3
Know <a href="#">how to calibrate orchard sprayers</a> for ground and tree applications <a href="#">based on tree-row-volume</a> .	1	2	3	1	2	3
Be able to determine adequate spray coverage.	1	2	3	1	2	3
Know when to use low and high volume spraying.	1	2	3	1	2	3
Be able to <a href="#">scout orchards</a> for detecting when pests and diseases are above threshold.	1	2	3	1	2	3
Obtain a <a href="#">private applicator's license</a> through the Board of Pesticides Control.	1	2	3	1	2	3
Know pesticide safety practices.	1	2	3	1	2	3
Know how to properly store spray materials.	1	2	3	1	2	3
Know the preharvest and re-entry intervals for spray materials used in the orchard.	1	2	3	1	2	3
Be able to prepare and keep an accurate spray log.	1	2	3	1	2	3

<b>Protecting Trees from Wildlife</b>						
Know the <a href="#">techniques to protect trees from damage caused by wildlife</a> .	1	2	3	1	2	3
Be able to calculate the economic cost of deer and vole damage compared to the cost of control measures.	1	2	3	1	2	3
Be able to effectively protect cherries from bird feeding/damage.	1	2	3	1	2	3
<b>Fruit Storage</b>						
Be able to measure fruit maturity to determine harvest dates for fruit that will be stored on a short or long-term basis.	1	2	3	1	2	3
Know the best storage conditions (temperature, humidity, controlled atmospheres, Smartfresh®) for the storage duration and variety.	1	2	3	1	2	3
Be able to monitor storage room conditions — how often and what instruments to use to measure temperature, humidity, and controlled atmospheres.	1	2	3	1	2	3
Be aware of and recognize the hazards of controlled atmosphere (CA) storage and how to avoid/prevent them	1	2	3	1	2	3
Know how to fill a cold storage room to maximize space and air circulation.	1	2	3	1	2	3
Know about <a href="#">fruit storage disorders</a> and how to prevent them.	1	2	3	1	2	3
<b>Marketing</b>						
Know the <a href="#">safety regulations and certifications</a> Good Agricultural Practices (GAP) and Food Safety Modernization Act (FSMA) needed for your market.	1	2	3	1	2	3
Be familiar with ways to effectively market produce to consumers.	1	2	3	1	2	3
Understand the pros and cons of direct marketing methods for selling fruit.	1	2	3	1	2	3
Understand the pros and cons of growing organic and conventional fruit.	1	2	3	1	2	3
Be able to calculate a profitable price for produce.	1	2	3	1	2	3
Understand the USDA Agricultural Marketing Service's <a href="#">tree fruit grading system</a> .	1	2	3	1	2	3
Be familiar with the quantities and packaging of produce (pound, peck, bushel, etc.) for retail or wholesale marketing.	1	2	3	1	2	3
Know how to effectively display produce for sales.	1	2	3	1	2	3
Know how to create or select signage for marketing produce.	1	2	3	1	2	3
Be familiar with the services of the <a href="#">Maine Department of Agriculture, Conservation, and Forestry</a> .	1	2	3	1	2	3
Be aware of marketing resources for tree fruit growers (see <a href="#">Resources</a> )	1	2	3	1	2	3
<b>Labor</b>						
Know how to recruit and hire workers for the farm.	1	2	3	1	2	3
Know how to motivate and manage workers.	1	2	3	1	2	3
Know how to train new workers for safety and specific tasks.	1	2	3	1	2	3
Be aware of <a href="#">labor laws</a> as they relate to domestic and off-shore farm workers and employers.	1	2	3	1	2	3
Be familiar with the Agricultural Worker Protection Standard (WPS)	1	2	3	1	2	3
Know how to properly dismiss an employee.	1	2	3	1	2	3
Be aware of the <a href="#">display requirements</a> of employee documents in the workplace.	1	2	3	1	2	3

Tools, Equipment & Safety						
Know about <a href="#">OSHA regulations</a> .	1	2	3	1	2	3
Be able to safely <a href="#">operate farm tractors</a> for mowing, spraying, and transporting fruit.	1	2	3	1	2	3
Be able to perform a pre-operational check of a farm tractor.	1	2	3	1	2	3
Know how to check fluid levels of a farm tractor.	1	2	3	1	2	3
Be able to attach an implement to the 3-point hitch of a tractor.	1	2	3	1	2	3
Be able to maneuver a tractor with a two-wheel trailer in a forward and backward motion.	1	2	3	1	2	3
Be able to operate a fork lift for moving tree fruit bins.	1	2	3	1	2	3
Be able to safely use of common orchard tools.	1	2	3	1	2	3
Be familiar with ladder safety.	1	2	3	1	2	3
Be able to select and use personal protective equipment (PPE) for farm tasks.	1	2	3	1	2	3
Be able to select and use personal protective equipment (PPE) for farm tasks.	1	2	3	1	2	3
Know how to perform preventative maintenance for small engine equipment.	1	2	3	1	2	3
Farm Business and Economics						
Be aware of effective record keeping of production yields, costs and sales.	1	2	3	1	2	3
Be able to relay information to the Schedule F tax form.	1	2	3	1	2	3
Know how to use an enterprise budget for decision making and for calculating the break-even point for specific crops.	1	2	3	1	2	3
Know how to calculate the cost of production for your tree fruit crop.	1	2	3	1	2	3
Know how to calculate a profitable price for produce.	1	2	3	1	2	3
Be aware of the insurance needs for your business.	1	2	3	1	2	3

## Tree Fruit Related Resources

Maine Department of Agriculture, Conservation, and Forestry [maine.gov/dacf/farming/index.html](http://maine.gov/dacf/farming/index.html)

## Management Guides

- Apple Production [extension.psu.edu/apple-production](http://extension.psu.edu/apple-production)
- Apples and other tree fruits. [fruit.wisc.edu](http://fruit.wisc.edu)
- Cherry and other tree fruits [bctfpg.ca](http://bctfpg.ca)
- New England Tree Fruit Management Guide [netreefruit.org](http://netreefruit.org)
- Peaches
  - Growing Peaches in Maine. [extension.umaine.edu/publications/2068e/](http://extension.umaine.edu/publications/2068e/)
  - Peaches. [extension.uga.edu/topic-areas/fruit-vegetable-ornamentals-production/peaches.html](http://extension.uga.edu/topic-areas/fruit-vegetable-ornamentals-production/peaches.html)
- Plum Production in Maine [extension.umaine.edu/publications/2034e/](http://extension.umaine.edu/publications/2034e/)

## Marketing Resources

- Assessing the Economic Feasibility of Growing Specialized Apple Cultivars for Sale to Commercial Hard Cider Producers *extension.umaine.edu/publications/2035e/*
- Good Fruit Grower *www.goodfruit.com*
- Selling What You Produce *http://smallfarms.cornell.edu/plan-your-farm/selling-what-you-produce/*
- The Packer *thepacker.com*

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