First, More Biological Tools and Mechanical Equipment for Urban Agriculture Production
<table>
<thead>
<tr>
<th>Scale</th>
<th>Seed starting</th>
<th>Power source and tillage</th>
<th>Direct seeding</th>
<th>Equipment</th>
<th>Cultivation</th>
<th>Harvesting</th>
<th>Post-harvest handling</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 acres</td>
<td>small hoop house, grow lights, planting trays</td>
<td>rototiller or walking tractor, custom work</td>
<td>Earthway seeder, Cyclone seeder</td>
<td>Back-pack, sprayer, irrigation, tools</td>
<td>Wheel hoe, hand hoes, digging forks, spades</td>
<td>Field knives, hand boxes, buckets, carts</td>
<td>Bulk tank, canopy, packing containers</td>
<td>Pickup with topper or van</td>
</tr>
<tr>
<td>4-6 acres</td>
<td>1,000 sq. ft., greenhouse, cold frames, field tunnels, planting trays</td>
<td>35-40 hp tractor, with creeper gear, power steering, high clearance</td>
<td>Planet Jr. plate seeder</td>
<td>1-row transplant, irrigation, more tools</td>
<td>Cultivating tractor (IH Super A or IH 140)</td>
<td>Potato digger, bed lifter, wagon, more boxes, buckets</td>
<td>Roller track conveyor, hand carts, walk-in cooler</td>
<td>Cargo van</td>
</tr>
<tr>
<td>7-10 acres</td>
<td>Additional cold frames, planting trays</td>
<td>40-60 hp tractor, chisel plow, spader</td>
<td>Stanhay precision belt seeder with belts</td>
<td>2-row transplant, sprayer</td>
<td>Tool bar implements: beet knives, basket weeder</td>
<td>More field crates</td>
<td>Barrel washer, spinner, pallet jack</td>
<td>1 ton truck with refrigeration</td>
</tr>
<tr>
<td>20+ acres</td>
<td>2,000 sq. ft. greenhouse</td>
<td>80 hp tractor with loader bucket and forks, compost spreader</td>
<td>Nibex or Monosem seeder</td>
<td>Irrigation, bed shaper, mulch layer</td>
<td>Sweeps (Besserides), Buddingh finger weeders, flame weeder, potato hiller, 2nd cultivating tractor</td>
<td>Asa lift, harvest wagon</td>
<td>Wash line, larger cooler, packing shed and loading dock</td>
<td>Refrigerated truck</td>
</tr>
</tbody>
</table>

Adapted from a table distributed at Michael Fields Institute Advanced Organic Vegetable Production Workshop, 2/2001, Jefferson City, MO.
Equipment and Tools

Appropriate Technology Resources

“Technology that saves energy & resources”

✓ National Center for Appropriate Technology
   see - http://www.ncat.org/

✓ Univ. of CA-Davis, Appropriate Technology for Small and Subsistence Farmers
Equipment and Tools

Watch the video at http://farmhack.org/tools
Equipment & Tools Care Basics

- Scrape off any excess mud or dirt. Use a stick to knock off large pieces and a wire brush for tougher spots. If the soil is really caked on, you may need to let the tool soak in a bucket of water for a few minutes before tackling it again.

- Wipe off the tool with an old rag and let it dry thoroughly.

- Remove any rust by rubbing it vigorously with a small piece of steel wool. (Be sure to wear gloves.)

- Sharpen the tool, if it has a sharp portion (this includes spades), with a file made especially for sharpening tools. Hold the tool steady against a solid object, such as a tool bench, and draw the file repeatedly across the edge at a 45-degree angle.

- Condition wooden handles by sanding any rough or splintery portions with sandpaper. Follow up by rubbing paste wax over the handle.

- Spray metal parts with a penetrating lubricating oil to protect from rust.

- Store in a dry spot. Avoid leaving tools on the floors of garages or other places likely to get damp during the winter.

EHow Home & Garden Editor. “How to Clean and Store Gardening Tools…”
Field Production Equipment Types

• **Manual implements**
  – Shovels, etc
  – Double dug bedding

• **Biological-based “implements”**
  – Animal-driven not covered in this course
  – Animal examples

• **Mechanical-driven implements**
  – Walk behind tractors
  – Four wheel tractors
Field Preparation Hand Tool Examples

- Digging Spade
- Digging Fork
- Root Jack
- Broad Fork or U-Digger

Purchase of hand tools of high quality metal is worth the extra expense for reliable & safe usage.
Biological Field Preparation

- **Animal Tractors**
  - mobile, bottomless, shelter-pen systems where animals prepare and fertilize market garden growing areas
  - key to creating an effective animal tractor system is to integrate the needs, behaviors, and products of the animals with the farm system as a whole

A. Lee, Animal Tractor Systems, The Overstory #50
http://www.agroforestry.net/overstory/overstory50.html
Biological Field Preparation

• Animal Land Clearing
  • small livestock, e.g., goats, can be used to clear unwanted brush in order to prepare land for market gardening
  • use with electrical fencing and guard animals
  • saves on fossil fuels and mechanical equipment
  • produces potential meat sales

See -
http://exopermaculture.com/2011/07/31/animal-power-for-habitat-restoration-goats/
Watch these short videos:
- “Market Garden Tool Wall” – see https://www.youtube.com/watch?v=D8GfGvpFsS0
- “What's in Jean-Martin's Tool Shed?” – see https://www.youtube.com/watch?v=4GGB723wEhg
Planter Examples

Earthway Seeder

Planet Jr.

Seed Stick Planter

Six Row Seeder
Cultivator Examples

- Wheel Hoe
- Half Moon Hoe
- Stirrup Head Hoe
- Colinear Head Hoe
- Mantis Cultivator
Cultivator Examples

- Flame Weeders

Watch the video at https://www.youtube.com/watch?v=vDpeHp_98zQ

http://flameengineering.com/collections/agricultural-flamers
Biological Cultivators

• **Weeder Geese**

- used successfully both historically and in more recent times
- used with great success to control and eradicate troublesome grass and certain weeds in a variety of crops and plantings
- crops include strawberries, corn, sugar beets, potatoes, onions, raspberries, blueberries, grapes, asparagus, mint, tree fruits, etc
- can practically eliminate the need to hoe and pull grass and weeds with proper use
- are "manure spreaders" as well as "cultivators."
- two to four geese per acre are enough in row plantings

[https://www.metzerfarms.com/UsingWeederGeese.cfm](https://www.metzerfarms.com/UsingWeederGeese.cfm)
Mechanical-Driven Tractor
“Walk-Behind Tractor”

- **Types**
  - Belt driven transmission (e.g., Troy Bilt)
    - Limited selection of attachments
  - Gear driven transmission (European Brands)
    - Expanded selection of attachments
European Walk-behind Tractor & Attachment Examples

- **Planters**
- **Cultivators**
- **Flail Mower**
- **Tiller**
- **Swivel Handles**
- **Transplanter**

See video at [https://www.youtube.com/watch?v=7jAr6K_hB7U](https://www.youtube.com/watch?v=7jAr6K_hB7U)
Mechanical-Driven Tractors

- Small size 4 wheel tractor

“Spader” Tillage

International-Farmall Cub
(used, older tractors are found at auctions and are very affordable & useful too)
4 Wheel Tractor Cultivation Attachment Examples

Rotary Hoe

Harrow

Cultivator

http://www.sare.org/Learning-Center/Books/Steel-in-the-Field/
Soil Spader Implement

- the state of art in soil preparation
- the mechanized equivalent of several digging shovels
- the concept behind spading is to mechanically reproduce the age-old technique of "double digging,"
- maintains the basic organic structure; and because they tear and do not cut or slice the soil, they help maintain the soil's tilth

Watch the video at http://www.youtube.com/watch?v=ycadZjZ1Vnw
Utility Vehicle Examples

Highly recommended for labor saving benefits.
Tall Tunnels/Hoop Houses

• Unheated greenhouses that can help market gardeners extend their growing season so that they can improve the profitability of their farms.

• Unlike commercial greenhouses that cost up to $20 per square foot to construct, high tunnels can cost as little as $0.50 per square foot.

• Greenhouse structures may be covered with glass, rigid panels, or double-layers of plastic, but high tunnels are usually covered with a single layer of plastic.

See video at - http://www.youtube.com/watch?v=VZ-JAGKcup8
Tall Tunnels/Hoop Houses

- Tall enough to walk-in comfortably and to grow tall, trellised crops such as tomatoes

- No standard dimensions but they typically fall within the ranges of 14-30 feet wide by 30-96 feet long


- High Tunnels Information Website [http://www.hightunnels.org](http://www.hightunnels.org)
Low Tunnels

- Shade cloth versions give warm season extension for cool season crops.

Slitted row covers have pre-cut slits that provide a way for excessive hot air to escape. Photo courtesy of Ken-Bar.
Shade House

• A shade house protects cultivated plants from excessive heat, light or dryness.

• Crop shade tolerances:
  – 40%: vegetable seedlings
  – 50%: tomatoes, peppers, lettuce
  – 70%: ferns, indoor plants

Emerging Protected Urban Ag

Aquaponics is a bio-integrated system that links recirculating aquaculture with hydroponic vegetable, flower, and/or herb production.

The technology associated with aquaponics is complex. They require intensive management & they have special considerations.

Model systems include the following:
- The North Carolina State University System - fish tanks sunk below the greenhouse floor
- The Speraneo System – use of 500-gallon aboveground tanks inside a greenhouse
- The University of the Virgin Islands System – use of fish rearing tanks with the aquacultural effluent linked to floating raft hydroponics

Vertical Farming Equipment

- Commercial-scale vertical farms can make use of the following:
  - abandoned warehouses in our cities
  - new buildings built on environmentally damaged lands
  - used shipping containers from ocean transports.

- Important equipment features include:
  - types of vertical farming production systems
  - LED lighting
  - climate control system
  - building design

- Refer to “Vertical Farming Online Resources” slide for training & information

Crop Production Technological Tools

- Sensors
- Computers
- Alternative Energy

Watch the videos “Revolutionizing the Way We Grow Food | Nat Geo Live” at https://www.youtube.com/watch?v=P3p8sFGxepE
And “Solar Powered Urban Farm” at https://www.youtube.com/watch?v=GAwkmP5_c3M
Ergonomics & Urban Ag

• Ergonomics
  – the science of fitting the job to the worker.
  – when there is a mismatch between the physical requirements of the job and the physical capacity of the worker, repetitive stress injuries (RSIs) can result.
  – workers who must repeat the same motion throughout their workday, who must do their work in an awkward position, who must use a great deal of force to perform their jobs, who must repeatedly lift heavy objects, or who face a combination of these risk factors are most likely to develop RSIs.

• Urban farming
  – like farming, involves physical activity susceptible to the development of RSIs.
Guidelines for Hand Tools

- When tools require force, handle size should allow the worker to grip all the way around the handle so that the forefinger and thumb overlap by 3/8”. Handle diameter should range from 1-3/8” for small hands to 2-1/8” for large hands, with an average of 1-3/4”.

- Handles should be covered with smooth, slip-resistant material (plastic or rubber). Dual-handled tools (like shears or pliers) should have a handle length of at least 4” and preferably 5”. They should have a spring return to maintain an open position, and handles that are almost straight without finger grooves.

Handle diameter is large enough for small overlap of thumb and fingers.

Well-designed tool: Handles are long. Spring return keeps tool open. Handles are covered with rubber or plastic grip.

Poorly-designed tool: Handle presses into base of palm and requires user to open after each cut (no spring).
Ergonomic Tools Examples

Strap-on stool

Hands-free crop washer

Harvest cart for greens

Healthy Farms, Healthy Profits Project
http://bse.wisc.edu/hfhp/index4.htm
The AgrAbility Project

• Purpose
  – assist people with disabilities employed in agriculture
  – assists people involved in production agriculture who work both on small and large operations
  – provide training, site visits, on-farm assessments, technical assistance, and other information directly to the farmer or rancher with a disability
  – national program but no state program is available for FL residents
Farming Safety

• Statistics
  – Farm accidents and other work-related health problems claim as many as 1300 lives and cause 120,000 injuries a year, most of which are preventable (1990)*
  – Each year, approximately 70 children ages 14 and under die from injuries occurring on a farm**

• National Ag Safety Database
  – Information on safe operation of farming equipment

* US Dept of Labor Fact Sheet No. OSHA 91-39 “Farm Safety
** National Safe Kids Campaign “Rural Injury”
Urban Ag
Harvesting and Post Harvest Equipment and Operations
Harvesting Equipment Examples

- Greens harvester – see [https://www.youtube.com/watch?v=OPIfw5_WoLU](https://www.youtube.com/watch?v=OPIfw5_WoLU)
- Harvest basket
- Harvest tub
- Harvest knives

- Appropriate tools promote proper handling & minimal physical damage to crops during harvesting activities.
Harvesting Operations

- The main factors for maintaining quality from the point of harvest forward are:
  - Harvest at proper maturity for the intended market.
  - Minimize mechanical injuries.
  - Maintain sanitation procedures.

- Harvest is the beginning of a series of critical operations in the production cycle. All the investment of time, money and energy necessary to grow a crop can be quickly lost from this point on.

- To avoid significant losses, growers must pick the crop at proper maturity and handle properly. Initial preparations include:
  - Establish the market(s) & know the quality expectations of the buyers.
  - Maintain the cleanliness of picking containers.
  - Set up product transport to and from the field(s).
  - Secure adequate labor for the harvest season.
Harvesting Operations

Challenges to Marketing
Fruits, Vegetables & Herbs

- Harvest: when, container,
- Transport to market: time delays
- Pulp temperature
- Food safety & security
Harvest Management Tips

- Each vegetable has a window of opportunity for harvest. The best way to determine when a vegetable is ready to harvest is from the characteristics of the plant itself.

- While some vegetables are quite forgiving in having a long harvest window, others can go from tender and tasty to tough and bitter overnight.

- For a guide to proper harvest maturity stages & techniques of different vegetables - see http://www.motherearthnews.com/crop-guide-growing-organic-vegetables-fruits-zl0z1211zsto.aspx#axzz3KnoGP3v7
Produce Quality Standards

❖ U.S. Grade Standards provide the produce industry with a uniform language for describing the quality & condition of marketed fresh foods – see http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateN&navID=USGradeStandards&rightNav1=USGradeStandards&topNav=&leftNav=&page=FreshGradeStandardsIndex&resultType=&acct=fres hgrdcert

❖ Food industry associations and retailers also are developing food grade standards to meet goals for alternative markets; e.g., Whole Foods – see http://www.wholefoodsmarket.com/about-our-products/quality-standards

❖ Alternative quality standards are being developed for niche markets, e.g., high Brix values – see http://ohioline.osu.edu/hyg-fact/1000/pdf/1651.pdf
Produce Quality Standard Example

Stage 1 *Green*: The tomato surface is completely green. The shade of green may vary from very light to dark. This is the ideal stage for preparing Fried Green Tomatoes, a southern favorite that involves coating seasoned, sliced tomatoes with corn meal, and shallow or pan frying. Tomatoes in this stage must be specified when ordering.

Stage 2 *Breakers*: There is a definite break of color from green to yellow, pink or red on 10% or less of the tomato surface. Tomatoes are typically shipped at this or the following stage.

Stage 3 *Turning*: Yellow, pink and/or red color shows on over 10%, but no more than 30% of the tomato surface.

Depending on your purveyor, you may receive fresh, field-grown tomatoes at any of the following stages. With proper handling (never falling below 55°F) and timely usage, you will maximize flavor in every use.

Stage 4 *Pink*: Pink or red color shows on over 30%, but no more than 60% of the tomato surface. When receiving tomatoes at this stage, hold in dry storage, away from onions, and monitor daily.

Stage 5 *Light Red*: Pinkish-red or red color shows on over 60%, but red color does not cover more than 90% of the tomato surface. Hold in dry storage, away from onions, and sort to pull out any tomatoes in stage 6. To speed ripening, trap ethylene gas released by tomatoes (see next section). Perfect for QSR tomato slicers.

Stage 6 *Red*: Red color shows on over 90% of the tomato surface. Perfect for slices and wedges, and ready to serve.
<table>
<thead>
<tr>
<th>Ripening Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Green-Stage 1</strong></td>
<td>&quot;Green&quot; means that the surface of the tomato is completely green in color. The shade of green may vary from light to dark.</td>
</tr>
<tr>
<td><strong>Breakers-Stage 2</strong></td>
<td>&quot;Breakers&quot; means there is a definite &quot;break&quot; in color from green to tannish-yellow, pink or red on not more than 10% of the surface.</td>
</tr>
<tr>
<td><strong>Turning-Stage 3</strong></td>
<td>&quot;Turning&quot; means that more than 10% but not more than 30% of the surface, in the aggregate, shows a definite change in color from green to tannish-yellow, pink, red, or a combination thereof.</td>
</tr>
<tr>
<td><strong>Pink-Stage 4</strong></td>
<td>&quot;Pink&quot; means that more than 30% but not more than 60% of the surface, in the aggregate, shows pink or red in color.</td>
</tr>
<tr>
<td><strong>Light Red-Stage 5</strong></td>
<td>&quot;Light red&quot; means that more than 60% of the surface in the aggregate, shows pinkish-red or red, provided that not more than 90% of the surface is red.</td>
</tr>
<tr>
<td><strong>Red-Stage 6</strong></td>
<td>&quot;Red&quot; means that more than 90% of the surface, in the aggregate is red.</td>
</tr>
</tbody>
</table>
Harvesting Operations

Minimize Mechanical Injury

Types:

- **Bruises**
  - Impact: Drops
  - Compression: Excessive pressure
  - Harvest temperature

- **Cuts, Punctures, Abrasion**
Post Harvesting Operations

Package closure:
- Stapling into fruit
- Over-filling crate

Sand abrasion from dirty harvest bucket
Loss of Quality Examples
Post-Harvest Handling Basics

• How you handle produce before, during and even minutes after harvesting makes a huge difference to the long term crop quality.

• Deterioration factors include temperature, loss of water, physical damage, disease microorganisms and even natural ripening processes.

• Postharvest life and quality can be significantly extended by proper handling and cooling to remove field heat within a couple of hours of harvest.
• The cooling operation must be at 95% relative humidity to minimize water loss, while not excessively cooling which could cause injury

• Cooling temperature examples
  – Near 32°F – leafy vegetables & most produce
  – Near 50°F - chilling-sensitive crops like pepper, cucumber, squash, and eggplant
  – Near 53°F - tomatoes

• Properly “cure” crops, e.g., onions & potatoes, at 50-90°F, depending on crop

• Do not allow condensation on harvested crops with good air ventilation during storage

http://edis.ifas.ufl.edu/pdffiles/CV/CV11500.pdf
Post-Harvest Equipment

- **Portacooler**
  - designed to be transported to the field for harvest
  - See video at [http://www.youtube.com/watch?v=5Paw1IZqhuk](http://www.youtube.com/watch?v=5Paw1IZqhuk)

- **CoolBot**, a small device that, according to the company's website, turns a window air conditioner into a turbo-charged cooling machine to transform a highly insulated room into a walk-in cooler – see [http://www.storeitcold.com/](http://www.storeitcold.com/)
THANK YOU . . .
Equipment/Post Harvest
Resources & References

• Agrability Project

• Armstrong. K. Urban Ag and Beekeeping - https://www.slideshare.net/MarkMiller185/nadine-armstrong-20160330-urban-agriculture-and-beekeeping

• ATTRA Publications
Equipment/Post Harvest Resources & References

• ATTRA Publications (cont.)

• Bees of Florida - [http://chiron.valdosta.edu/jbpascars/Intro.htm](http://chiron.valdosta.edu/jbpascars/Intro.htm)


• Coleman, E. Focus on Tools - [https://www.youtube.com/watch?v=wETKlh4y3A&list=PL5Ygyz09Ed4cecpC15z2tvYAez8gBF_DO&index=3](https://www.youtube.com/watch?v=wETKlh4y3A&list=PL5Ygyz09Ed4cecpC15z2tvYAez8gBF_DO&index=3)
Urban Ag Equipment/Post Harvest
Online Resources

• Energy Farms Network - see http://www.energyfarms.net/
• Journey to Forever, Appropriate Technology Agriculture Resources
  http://journeytoforever.org/at_linkag.html
• Market Farm Toolbox - http://www.marketfarmtoolbox.com/
• McGregor, S.E., Insect Pollination Of Cultivated Crop Plants
• National Ag Safety Database – http://nasdonline.org/
• Peet, M. Sustainable Practices for Vegetable Production in the South.
  http://www.cals.ncsu.edu/sustainable/peet/
• Schonbeck, M. 2011. Utilize Biological Processes to Further Reduce Weed Pressure – see
  http://www.extension.org/pages/18548/utilize-biological-processes-to-further-reduce-weed-pressure
Urban Ag Equipment/Post Harvest
Online Resources

- Small Tractor FAQ - http://www.andrew.cmu.edu/user/kb13/ans_brands.htm
- UC Agriculture Ergonomics Research Center http://ag-ergo.ucdavis.edu/
- UF/IFAS Post Harvest Program - http://postharvest.ifas.ufl.edu/
- UF/IFAS/FAMU Small Farm & Alternative Enterprise Program
  - Post harvest handling publications - http://smallfarms.ifas.ufl.edu/
- Univ of Missouri Extension, Weeding With Geese http://extension.missouri.edu/xplor/agguides/poultry/g08922.htm
Urban Ag Equipment/Post Harvest Online Resources

- **UF/IFAS EDIS**
  - Pesticide Applications and Equipment Publications - see [http://edis.ifas.ufl.edu/TOPIC_Pesticide_Applicators](http://edis.ifas.ufl.edu/TOPIC_Pesticide_Applicators)
  - Portable Demonstration Forced-Air Cooler - [http://edis.ifas.ufl.edu/AE096](http://edis.ifas.ufl.edu/AE096)
  - Small Farms and Alternative Enterprises – see [http://smallfarms.ifas.ufl.edu/](http://smallfarms.ifas.ufl.edu/)

- **US Dept of Labor Fact Sheet No. OSHA 91-39 “Farm Safety”**
[http://ehs.okstate.edu/training/OSHAFARM.HTM](http://ehs.okstate.edu/training/OSHAFARM.HTM)

Urban Ag Equipment/Post Harvest
Online Video/Podcast Resources

• Biointensive Farming – see http://growbiointensive.org/

• Dirksen, K. FarmBot: open source backyard robot for a fully automated garden – see https://www.youtube.com/watch?v=BqYrAWssrrY

• The NOFAVT. The Market Gardener with Jean-Martin Fortier, Six Figure Farming. 5 Parts – see https://www.youtube.com/watch?v=0hBUOdv2vn8

• Youtube Videos
  – City. Secrets to Successful Urban Farming – see https://www.youtube.com/watch?v=6FVRw6ROkVI
  – The Urban Farmers Channel – see https://www.youtube.com/user/urbanfarmercstone
  – Eliot Coleman Channel – see https://www.youtube.com/playlist?list=PLgVHK3pelUa5GsnOuP5lHhLUfURKsFEF
  – Urban Agroecology Channel – see https://www.youtube.com/playlist?list=PLEdS4pqgZUJGrNh5SZRIwo9WjLqSY6okD
Vertical Farming Online Resources

- Agritecture – see https://www.agritecture.com/
- Appropriate Vertical Farming – see https://brightagrotech.com/technology/
- Association of Vertical Farming – see https://vertical-farming.net/
- Center for Research in Alternative Farming Technologies – see craftagro.com/
- Frazier, I. 2017. The Vertical Farm. – see https://www.newyorker.com/magazine/2017/01/09/the-vertical-farm
- Seedstock. 10 Educational Programs Helping to Support the Growth of Indoor Agriculture – see http://seedstock.com/2016/08/22/10-educational-programs-helping-to-support-the-growth-of-indoor-agriculture/
- Urban Ag Podcast – see http://www.microbe.tv/urbanag/
- Vertical Farming Institute – see http://www.verticalfarminstitute.org/en/
Urban Ag/Post Harvest Equipment
Vender Resources

- Earth Tools – Walk Behind Tractors & Compatible Implements
  http://www.earthtoolsbcs.com/index.html
- FarmTek - http://www.farmtek.com/farm/supplies/home
- Gemplers: Agricultural Sprayers
  http://www.gemplers.com/list.aspx?listNo=sprayers&s_kwcid=pesticide%20sprayers|976478065
- Johnny’s Select Seeds - http://www.johnnyseeds.com/
- Peaceful Valley Farm & Garden Supply: Tools
  http://www.groworganic.com/browse_389_Tools.html
- Tiny Farm Gear - http://gear.tinyfarmblog.com/
Used Farm Equipment Resources

- **Agriculture Equipment Classifieds**
  - Florida Farmer & Rancher
    http://www.farmerandrancher.com/
  - Farm Equipment, Tampa SuperAds
    http://www.tampasuperads.com/Farm_Equipment_Classifieds/index.aspx
  - Florida Market Bulletin, FL DACS
    http://www.florida-agriculture.com/fmb/agmachinery.htm

- **Auction Companies**
  - Atkinson Auction Co., Lake City, FL
    http://www.atkinsononline.com/cgi-bin/mndetails.cgi?atkinson13
  - Tampa Machinery Action, Tampa, FL - http://www.tmauction.com/

- **Craigslist** - http://sarasota.craigslist.org/grd/
- **Farm Equipment Dealers in Florida**
  http://www.business.com/directory/agriculture/equipment_and_supplies/dealerships/florida/
- **Florida Farm Link** - http://www.floridafarmlink.org/
- **Used Farm Equipment & Supplies in FL**
  http://www.superpages.com/yellowpages/C-Used+Farm+Equipment+&+Supplies/S-FL/