Growing Pitch Pines:

Seed Separation:

1. After collecting the current year cones in mid to late September (ahead of the porcupines and squirrels) put them in a cardboard box and store them in a cold dry place like a garage. The box should provide lots of room, as the cones will open somewhat as they dry. Also, the bottom folds of the box should be taped inside so the loose seeds won't fall out.
2. About mid December to early January, bring the box indoors and put it in a warm place (on a radiator) for a week. Most of the cones will open. Put the cones on a cookie sheet and heat them for about 30 minutes in a 250F degree oven. This will release some pine gum, so put aluminum foil on the cookie sheet. It also smells pretty strong, so I do this while my wife is out.
3. When the cones cool, pry the bracts open with a screw driver or a bottle opener and pick out the seeds with a pair of tweezers. I use the church key on my Swiss Army knife and the little tweezers from the handle. Don't bother to remove the "wings" from the seeds.
4. It is worthwhile counting the seeds at this point and then store them in a plastic Zip Lock bag. Put the Zip Lock bag in the refrigerator at 4C and hold the seed until you are ready to start stratification. Seeds will keep under these conditions for at least 5 years.

Oxygen Bath & Stratification: 23 to 27 days.

1. Determine when you want the seeds to germinate, after which they'll need inspection every two days. I usually want germination in early to mid February, which allows the trees to get to about 10 inches high by mid September, when they can be planted outside.
2. #1 Oxygen Bath: 24 hours. Take about three times the number of seeds that you want trees and put them in a clear plastic bottle like a peanut butter bottle or any large mouthed plastic jar. Stretch a piece of cloth over the top and hold it there with an elastic. I use a piece cut from a nylon stocking. Put it in a deep sink and turn on the cold water to a steady drip, about one drop per second onto the cloth. This will provide an oxygen saturated bath to soak the seeds. The next day you'll see small oxygen bubbles on the inside of the jar. Pick up the bottle with the cloth intact and shake it very hard. This will separate the seeds from the wings. Be careful to hold the cloth securely in place with your hand, so as not to lose the seeds.
The wings from the seeds will float along with a fair number of the actual seeds. I have found that anywhere from 25% to 70% of the seeds are infertile floaters. Floaters must be thrown out along with the wings. Don't bother to try separating the wings from the floaters unless you are very short of seeds, because the percentage of live seeds stuck in the floating mass is very small. The sinkers at the bottom of the bottle are viable seeds. Empty the water and the sinkers through a kitchen sieve and dump the viable seeds onto a paper towel. In 10 minutes they should dry just enough to handle without sticking to you fingers.
3. Stratification: 21 to 25 days. This is an attempt to mimic cool moist spring conditions in leaf litter. Put a folded paper towel in a plastic Ziplock or Glad storage container with a lid (cut the edges to fit so there are four layers). Dampen the paper towel but don't soak it. Spread the seeds on the towel and cover with another paper towel similarly fitted. Dampen this towel and press very lightly onto the seeds. Put the lid on securely and put the container into the refrigerator at about 4 degrees C. Leave them for 21 to 25 days, checking every few days for mould. If there is mould use a plant mister and spray lightly with garden sulfur diluted with water (1 teaspoon per litre of water).

4. #2 Oxygen Bath: 24 hours. Similar to #1 above, put the seeds back into the plastic jar and drip water through the cloth cover. If there are any floaters at this point, discard them. Catch the seeds in a the kitchen sieve and let them dry on a paper towel just enough the handle. This is a good time to count the viable seeds so you can calculate the germination rate.

Germination: 8 to 15 days.

1. A day before the above #2 oxygen bath, place the compressed 4" x 1.5" plugs in well ventilated 10" x 20" plastic trays (84 plugs per tray). Put the trays in a water bath with about 3/8 inch of water. The clear plastic lids, turned upside down, work well for this. Put a flat piece of plywood on top of the plugs and weight it with a brick to prevent the plugs from erupting out the top. After about 4 hours the trays should weigh between 10 and 11 pounds or about 5 kilos and the plugs should be all about the same height.
2. As soon as the seeds come out of #2 Oxygen Bath plant them in the plugs. Don't cover the seeds. Spray the plugs with a dilute mist of garden sulphur (1 teaspoon per litre of water) to help control damping off. Cover the trays with the clear plastic tops that keep the humidity up. Place the trays under lights at about 20 degrees. They are not very sensitive to temperature. Cool is good. The plug should be just damp to the touch and never wet. If you do over water, let them sit for half an hour, then pick up each plug and squeeze the excess water out. Then put them back under the lights and the lids.
3. You will have a good number of viable seeds left over. In your trays you are going to have 5 to 10% of the seed that just won't germinate. We don't want empty spaces in the trays; so, this is where we're going to cheat. Take the Ziplock or Glad container and wash it thoroughly. Then cut a piece of plain paper to fit the bottom of the container and dampen it. Spread the excess seeds on the paper and cover with a couple of layers of fitted paper towel. Then dampen the whole thing with sulphur mist. Use computer paper and <u>not</u> paper towel on the bottom, because the little root sprouts will go through the porous towel and they'll break off when you try to take them out. The little roots can't get through the harder paper. Place these sealed containers under your lights for about 8 days. Check every two days for mould and give it a spray of sulphur as needed.
4. At about 8 days you will see sprouts starting in the trays first and in the container soon after. In about 12 days the longest of the sprouts in the container will be between 0.5 and 1 centimetre. Move the container back to the fridge at 4 deg C, which will put the seeds on hold. They'll stay alive this way for up to 3 months.
5. By 16 days it you'll see that some of the seeds in the plugs are <u>not</u> going to germinate. This is where the cheating comes in. Poke a hole with the point of a pencil into the top of the plug beside each dead seed. Take a sprouted seed from the container in the fridge and carefully insert the root down the hole. Close the hole with the end of the pencil. Some other sprouts in the trays will die; which is normal. Do the same to replace them with sprouted seeds from the container. I have found that the corner plugs in each tray dry out much faster than the others. Wrapping the corner plugs with masking tape will keep them from drying out.
6. By 30 days you'll have trays of little trees about 1 to 1½ inches high with seed cases still attached to the tips. If you want to remove these, do it carefully as the seed leaves are very delicate. You should now be able to remove the plastic covers from the trays. Keep the plugs well ventilated, even using small fan if needed. You'll need to water a bit more often after removing the cover. After the cover is removed, the next watering should contain 10-52-10 fertilizer at a rate of about 10 ml per litre of water. See bottom watering below.
7. Use Bottom Watering: The outside plugs in the tray will dry faster than the middle ones. You

can water from above sparingly around the outside when they feel dry. Weigh the trays and when they dry to 4 or 5 pounds put about 6 pounds of water in the clear plastic lid and put the tray into it. This will water the plugs from the bottom, which I have found works much better than the top. The tray should weigh 10 or 11 pounds, that is sufficient. Any more and you'll risk "Damping Off", which is a soil borne fungus that kills seedlings very fast. To keep the green or white mould off the plugs, give them a little spray of garden sulphur.

Growing and Root Pruning:

1. As soon as you can, without risk of frost (around April 1 to 15), move the trays out into a greenhouse or cold frame. The little trees can actually take a very slight frost. They will require much less water in the cooler greenhouse than indoors under the lights.
2. Let them grow and monitor the water. Use bottom watering as above keeping the trays between 5 and 11 pounds. You can still water sparingly around the outside between bottom waterings.
3. About the end of May, they will need their first root pruning. Lift out one of the plugs and you'll see that the new roots are growing into the neighbouring plugs. These must be cleaned off. Start at one end of the tray and lift each plug, stripping off the roots that are outside the plug. The effect of this is to grow more roots inside the plug and to make it much easier to get the plugs separated in September. You will tear some of the plug wrappers. Masking tape will fix it and it will rot away so as not to damage the tree later. Don't use duct tape because it doesn't rot fast enough. After this root pruning (end of May), the next watering should contain fertilizer 10-52-10 at 10 ml per litre of water and maintain the maximum of 11 pounds per tray.
4. About late July do the second root pruning, same as above. Fertilize again, as above.
5. Plant the little trees outside or lag them in between September 15 and October 31.