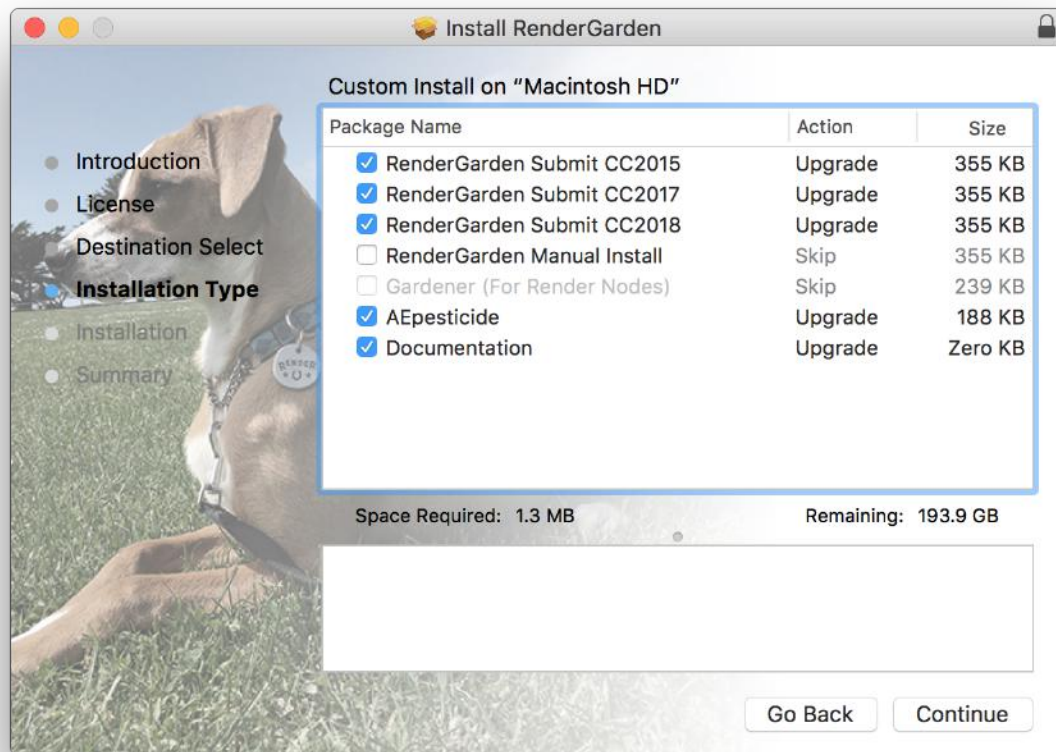


# ./RenderGarden

[www.mekajiki.com](http://www.mekajiki.com)

Documentation v1.0.0  
11-28-2017

## RenderGarden Installation



Each RenderGarden license entitles the user to run one submit script, and an unlimited number of render nodes.

- By default, the installer is set to install the RenderGarden Submit Script for Adobe After Effects CC 2015, CC 2017, and CC 2018.
  - Be sure to uncheck non-used versions of Adobe After Effects to prevent unnecessary duplicate installs.
- RenderGarden Manual Install is an alternate installation of RenderGarden for users with custom setups or directories.
  - Use this option if you have moved After Effects from its default location in your Applications/Program directory.
  - Or if you are using aliases, shortcuts, or symbolic links for your After Effects Scripts.
    - Install all components into your Applications/Programs/RenderGarden directory then move them to their final location.

- Move the RenderGarden Gardener application and RenderGarden.jsxbin to After Effects/Scripts/ScriptUI Panels.
- Gardener for Render Nodes- To install the stand-alone Gardener application on Render Nodes, uncheck the submit scripts and select the Gardener checkbox.
- AEPesticide- On a Mac, AEPesticide is selected by default.
  - We recommend installing this utility to quickly kill stuck aerendercore processes which can result from too many Hyper-Threaded renders.
  - AEPesticide should be installed on all workstations and render nodes.
- Documentation- A web link to our online Render Garden Support page is selected by default.

Render Garden installs to the following locations:

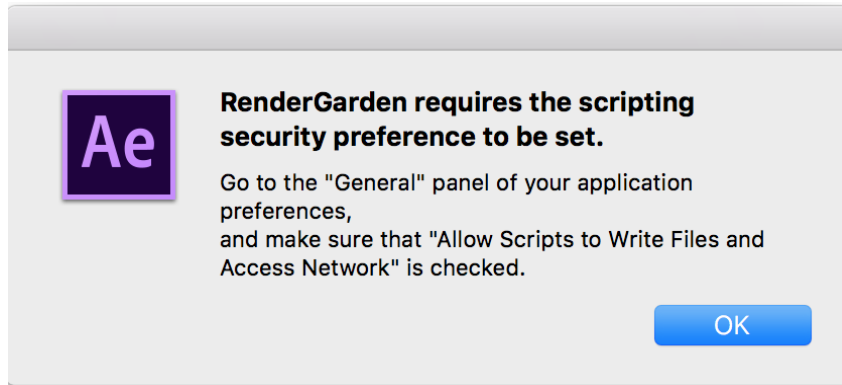
- In After Effects/ScriptsUI Panels
  - RenderGarden Gardener
  - RenderGarden.jsxbin
- In Applications (Mac) or Programs (Windows)
  - RenderGarden Folder
    - RenderGarden Gardener Standalone Application (for Render Nodes)
    - AEPesticide (Mac only).
    - Web Link to our online Render Garden Support page

## **RenderGarden After Effects Script UI Panel – First Launch**

Each license of RenderGarden includes one submit script for Adobe After Effects which is used to submit your comps from the Render Queue to the After Effects command-line tool, aerender. RenderGarden splits your comp into a specified number of segments, which we refer to as seeds. Seeds are then rendered by multiple command-line windows which we refer to as Gardeners. Segmenting the comp into multiple seeds maximizes your CPU cores. The network rendering option gives you the ability to add an unlimited number of free render nodes that run Gardener to scale your rendering.

To run the RenderGarden ScriptUI Panel, from the Window menu in After Effects, select RenderGarden.jsxbin.

On first launch, After Effects (by default) may give the following warning- You will need to close the empty RenderGarden panel and go to the After Effects General preferences panel, select “Allow Scripts to Write Files and Access Network” in order to enable RenderGarden.

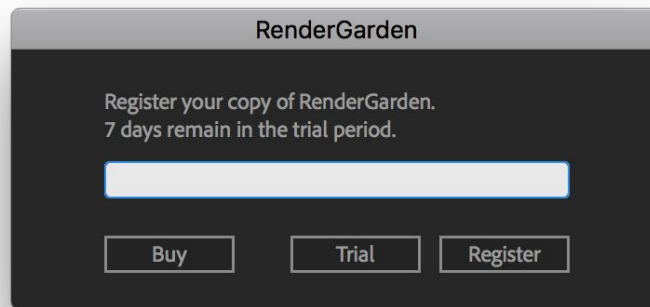


Once the preferences are changed, you can go back to the Window menu and select RenderGarden.jsxbin again.

## RenderGarden After Effects Script UI Panel – Licensing

Upon initial successful launch, RenderGarden will bring up the license activation dialog.

- Enter your RenderGarden license and click Register.
- Click Trial to use RenderGarden for a 7 Day trial period.
- Click Buy to purchase.



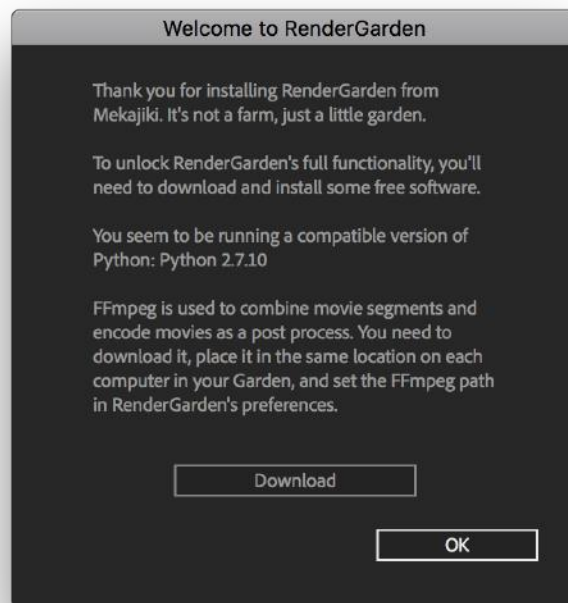
## RenderGarden – Component Download

Once you register your copy, another dialog will appear explaining that RenderGarden requires two key open-source components which are not included in the installer:

Python is required for general RenderGarden operation.

- MacOSX comes with Python pre-installed.
- Windows users need to:
  - Download and Install Python
  - Specify the file path for Python in the RenderGarden preferences.

FFmpeg is required for network rendering movies on multiple machines, Hyper-Threaded rendering of movies on a single machine, and the Movie Post-Processing feature.



The dialog includes a button to take you to a RenderGarden webpage with links to the FFmpeg and Python download sites.

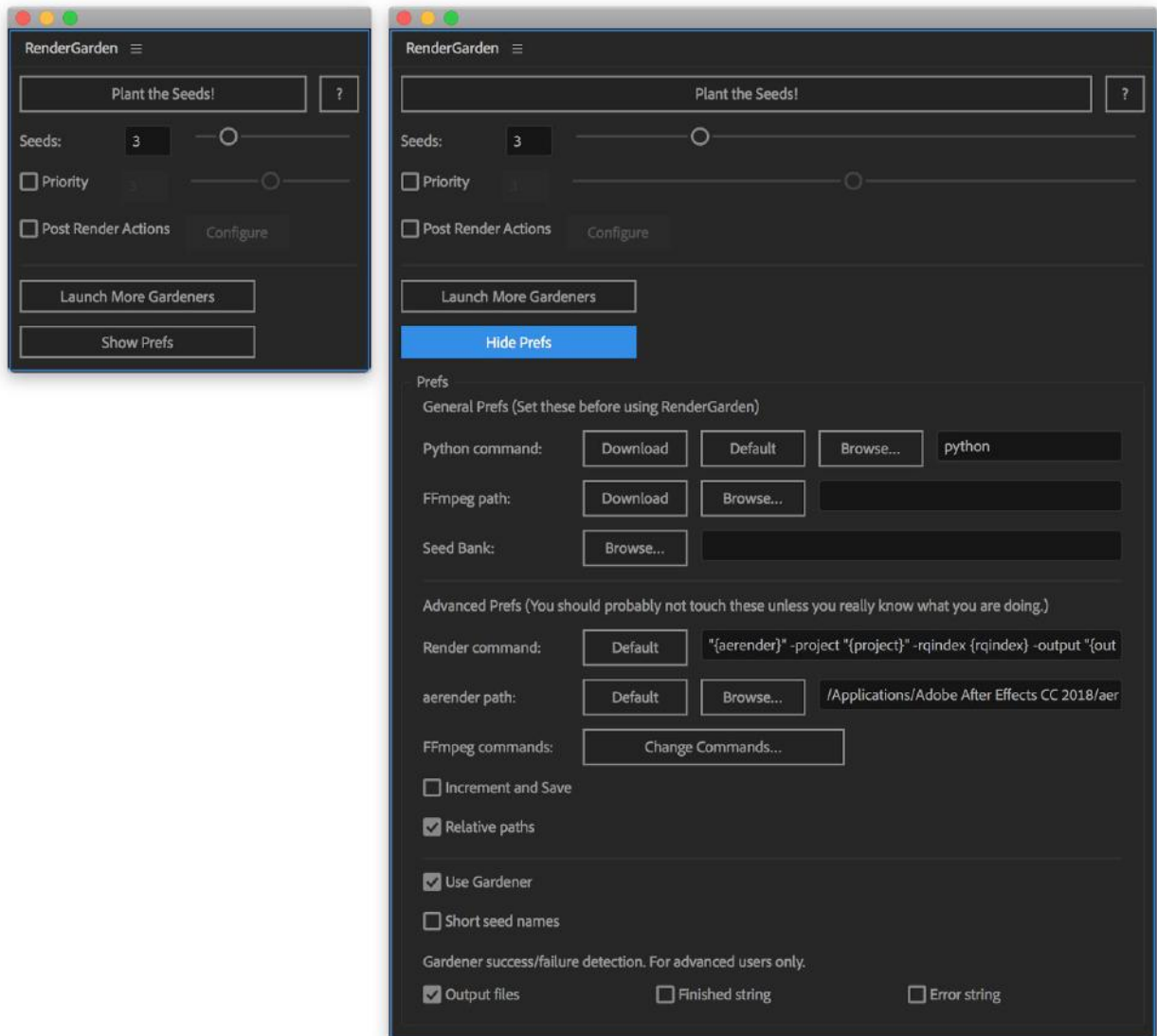
## FFMPEG / Python

 FFMPEG	 Python 2.7 (Windows)
Select	Download
Version: 3.4	Windows x86-64 MSI Installer
Architecture: Your OS	
Linking: Static	
Download Build	

We recommend that you install Python and FFmpeg before attempting to use RenderGarden. If you do not install the components on your workstation and render nodes, RenderGarden will not run as expected.

## RenderGarden After Effects Script UI Panel

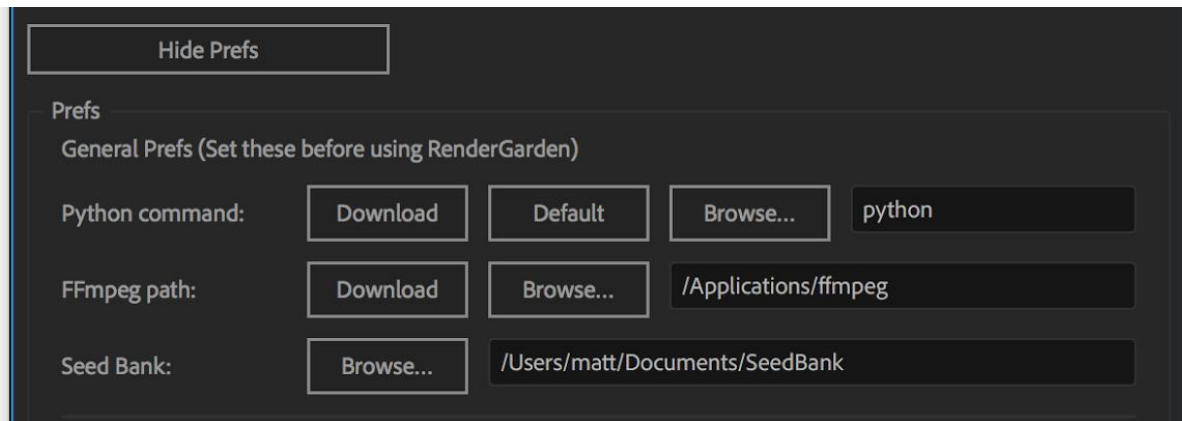
By default, the RenderGarden ScriptUI panel is minimized to the bare options required to submit a render. Once you have the preferences, or prefs, configured you can work with this minimized UI which can be conveniently docked into your After Effects workspace.



## General Prefs – Setting File Paths

Before you begin working with RenderGarden, you will need to specify the file paths to FFmpeg (Mac/Win), Python (Win only), and your global Seed Bank. These can be found under RenderGarden Prefs.

Click on the “Show Prefs” button on the lower left side of the minimized panel in order to expand the panel and reveal the preferences. Note- if your minimized panel is docked, you may be cropping out the lower controls and will need to expand the palette (After Effects tip: use the tilde (~) key to maximize After Effects panels.)



Python command: This tells RenderGarden the Command and File Path to run Python.

- Python is installed by default in MacOSX therefore this field does not need to be changed.
- The Download button takes you to the RenderGarden website with a direct link to the Windows Python installer.
  - Install into the default location.
- Selecting Default will enter the Default command.
- If you install into a custom location, the Browse button will allow you to find the custom file path.

FFmpeg path: This tells RenderGarden where the FFmpeg application is stored.

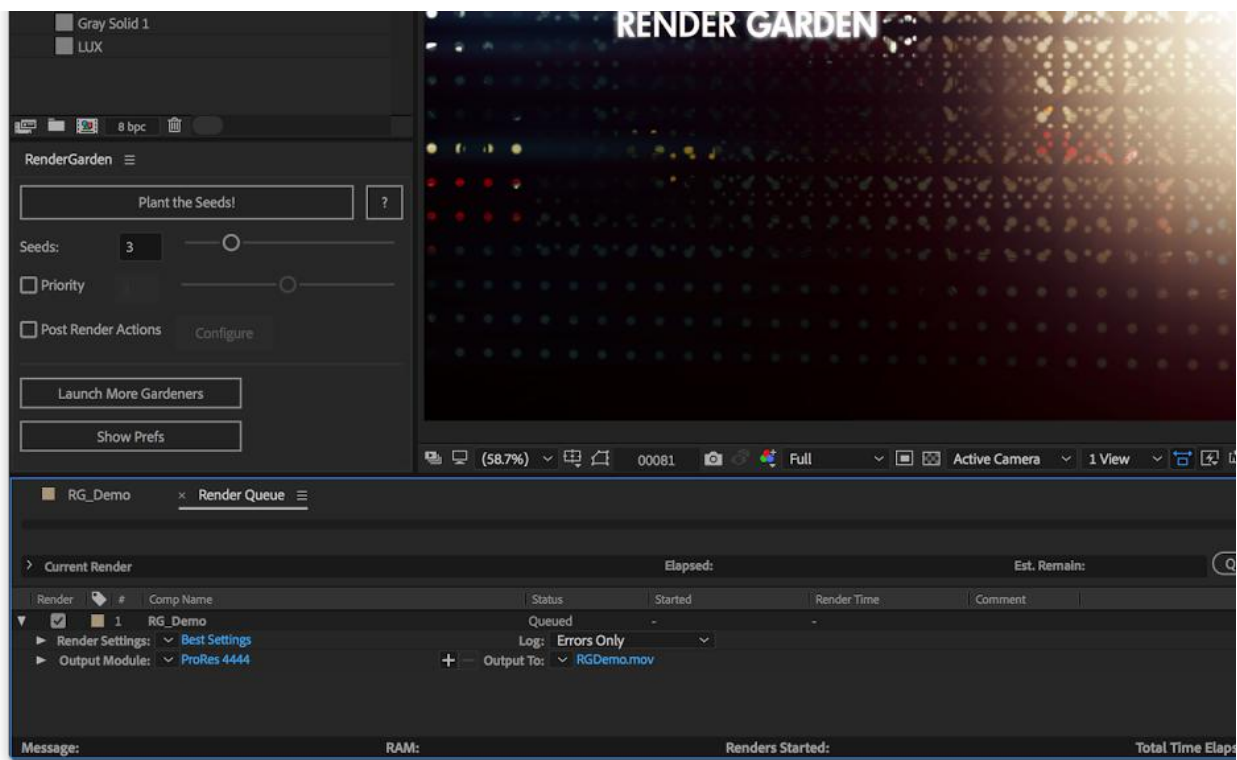
- The Download button takes you to the RenderGarden website with a direct link to the Mac or Windows FFmpeg installer.
  - Install FFmpeg into your Applications (Mac) or Programs (Win) folder.
- Click the Browse button to navigate to the installed FFmpeg application.



Seed Bank: RenderGarden saves temporary files into a Seed Bank folder, which the Gardeners always monitor while awaiting their next job.

- All temporary files are saved to one global location that is accessed by all render nodes.
- Temporary files are manually purged (similar to a global cache folder).
- Gardeners will monitor all jobs, from any project, creating a simple unified render manager.
- Gardeners on remote render nodes need to be pointed to one global location for all jobs when network rendering.

## Submitting Jobs



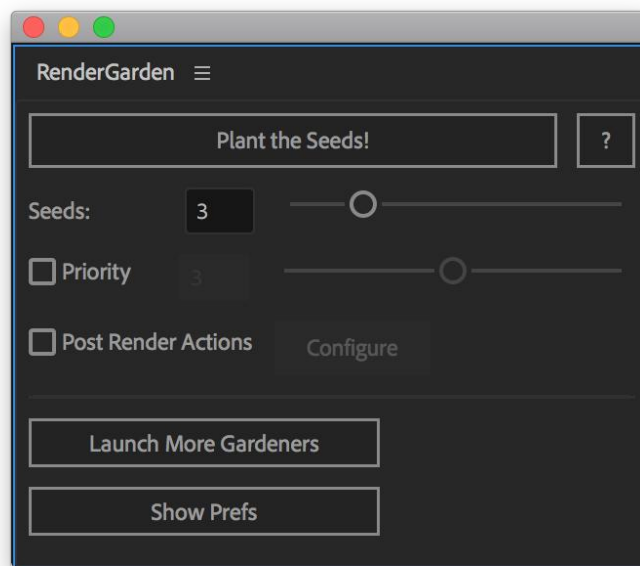
To submit a comp to render through RenderGarden, you will need to add a comp to the render queue just as you would during the regular After Effects rendering process.

- Set the Output Directory
  - If you are network rendering the After Effects project, an output directory must be located on a shared server.
- Set the Render Settings
- Set the Output Module.

- RenderGarden supports Quicktime, AVI movies, and Image Sequences from the After Effects Output Module.
- Make sure render item is checked in the Render Queue.
- **DO NOT** hit Render in the After Effects Render Queue! Instead you will hit the “Plant the Seeds” button in the RenderGarden script panel to submit your render.

After everything is set up in the Render Queue you will use the RenderGarden submit script to send the render to aerender for Hyper-Threaded rendering in the background or over your network.

## Submit Script



**Plant the Seeds:** This button is used to submit your Render Queue items to RenderGarden for rendering.

**Seeds:** RenderGarden will split your comp into a number of segments for rendering called seeds.

- 1 Seed is equivalent in speed to the native After Effects render queue, but will render in the background so that you can continue working in After Effects.
- If there is more than one seed, your comp will be split into multiple segments. These segments/seeds can be rendered concurrently on a single computer (Hyper-Threaded) or on multiple computers (render nodes) over your network.
  - For example, 2 Seeds will send half of your comp to one terminal window and the other half to a second terminal window and render them concurrently (assuming two Gardeners are launched).
    - If only one Gardener is launched and you submit two seeds, the first segment will need to complete before the second segment begins rendering.
      - You can use this to your advantage to maximize your rendering efficiency.
- The seed number will vary depending on cores per machine, memory per machine, and the number of machines in the network rendering pool.
  - For example- if you have two 12-core machines, you can set the number of seeds to 20 and have 10 terminal windows rendering concurrently on each machine.
  - Different factors in your comps or plug-ins may require more or less seeds to maximize CPU usage, therefore this number should be adjusted on a case by case basis.

**Priority:** When enabled, priority can control the rendering order of multiple comps, allowing you to better manage rendering times. Priority settings are ranked from 1 to 5, with 1 being Top Priority.

**Post Render Actions:** After a Movie or Image Sequence is rendered using the format specified in the After Effects Render Queue's Output Module, these options will automatically encode an mp4 and/or QuickTime version.

- Click on the Configure button to specify formats and codecs.

**Launch More Gardeners:** This button allows you to launch more Gardeners in the background which will wait for Planted Seeds.

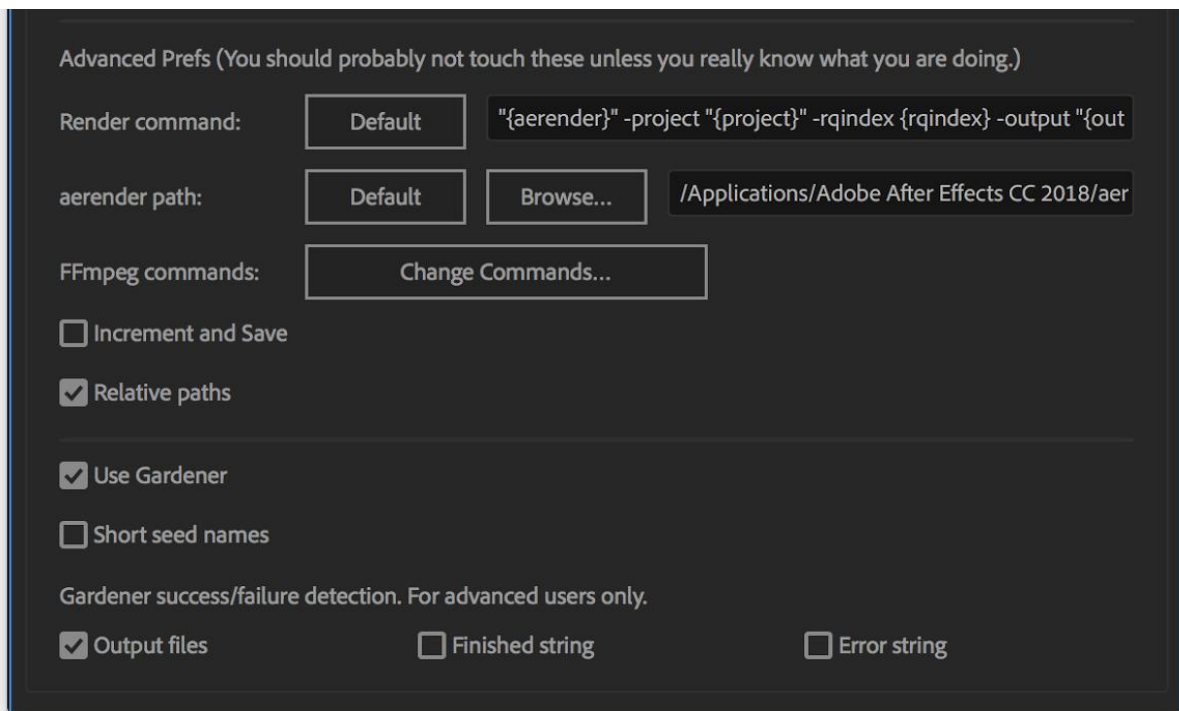
- Gardeners will sit open waiting for seeds in the Seed Bank to start rendering.
- You can change the number of Gardeners at any time.
- The "Launch More Gardners" button is the main way to launch Gardeners on computers running the Render Garden submit script.

- Render Nodes will not have the script installed, so instead these machines will run the stand-alone Gardener application.

**Show/Hide Prefs:** This button maximizes the window to show all of the preferences.

## Advanced Prefs

The advanced preferences panel offers additional control and, for the most part, will never need to be modified.



**Render Command:** This is the command sent to aerender to submit the comp. We include a number of flags which are needed for consistent renders. Power users can modify the flags in this text field, but in general this should not be modified. If anything goes wrong with your changes you can always hit the “Default” button to return to the factory settings.

**aerender Path:** This is the path to the aerender command-line application with a standard installation of After Effects. If users modify the After Effects folder hierarchy, they may need to change the file path to aerender by clicking the Browse button. If anything goes wrong with your changes you can always hit the “Default” button to return to the factory settings.

Ffmpeg commands: Clicking the “Change Commands” button allows you to modify the command-line flags used by FFmpeg to combine Quicktime segments and encode post-render movies.

Increment and Save: When enabled, your project will be saved and version upped every time you render (i.e. Plant the Seeds).

- This option is necessary if your network does not have a central server for network rendering.

Relative Paths: By default, when enabled, RenderGarden will use Relative Paths for all of the file paths specified in the Preferences. Unchecking this will require full absolute paths.

Use Gardener: By default RenderGarden will use the Gardener tool to automatically launch seeds as soon as they are planted.

- When disabled, users will need to manually find the seeds and launch them by double clicking on each one.

Short seed Names: When enabled, RenderGarden will remove the name of the output file from the Seed filenames.

Gardener Success / Failure Detection.

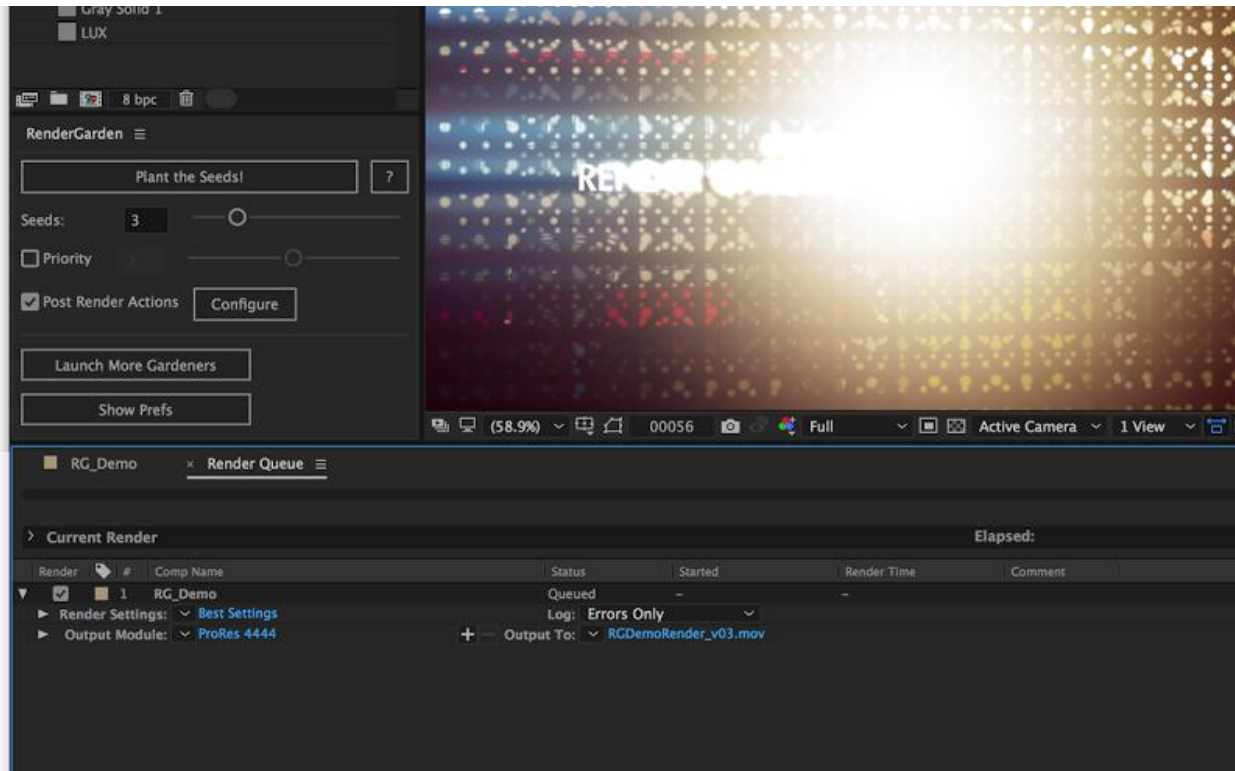
Gardener has three ways to detect if a rendered seed has completed successfully:

- Output Files are the default selection. When a seed finishes rendering, Gardener will look to verify that the file has been created.
- The Finished String checkbox can be enabled to verify a render by looking for the word “Finished” in the aerender logs. This is useful if errors are not being reported correctly or segments fail to render.
- The Error String checkbox can be enabled to catch errors if the word “error” is found in the aerender logs. This is useful if errors are not being reported correctly or segments fail to render.

Once preferences are set they should not need adjusting, you can work with the Prefs hidden.

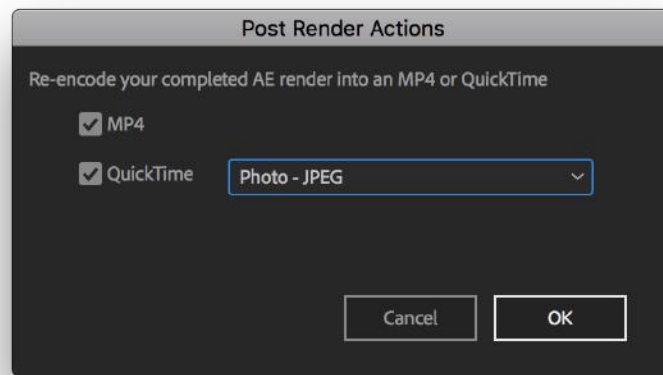
## **Gardeners**

After you plant your seeds, RenderGardener will render the specified number of seeds as segments to multiple aerenders running in the MacOSX Terminal or Windows Console.



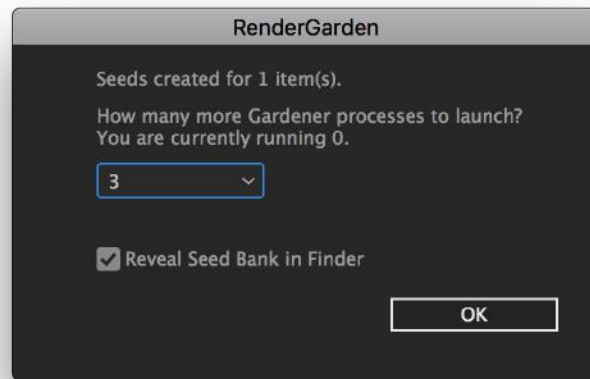
In the example above RenderGarden is setup to start a render.

- After Effects Render Queue has one comp set to render.
  - Render Settings are set to Best
  - Output Module is set to ProRes 4444 (10bit Master QT)
  - Output To directory is set with a file name.
- RenderGarden Script UI Panel is set with the following settings.
  - 3 seeds are set to render one comp on a single MacBookPro with 4 physical cores (8 virtual cores).
    - In general it is good to limit the number of seeds per computer to the physical number of cores or less.
  - Post Render Actions is checked on.
    - The Configure Dialog has MP4 and QuickTime checkboxes enabled.



- Once the ProRes 4444 QT set in the Render Queue is finished rendering, FFmpeg will post-transcode two more movies.
  - H.264 .mp4 file for small file size preview.
  - A Photo-JPEG QuickTime for offline playback.
    - The QT codec popup allows you to chose common QT codecs including Animation, DNxHD, Photo-JPEG, and ProRes.
    - FFmpeg presets can be adjusted in the Advanced Prefs.,
    - but in general it is easier to chose other codecs as the primary render in the After Effects Render Queue.

When “Plant the Seeds!” Is clicked, the comp in the render queue is submitted to RenderGarden and a Gardener Dialog appears confirming that Seeds were created.

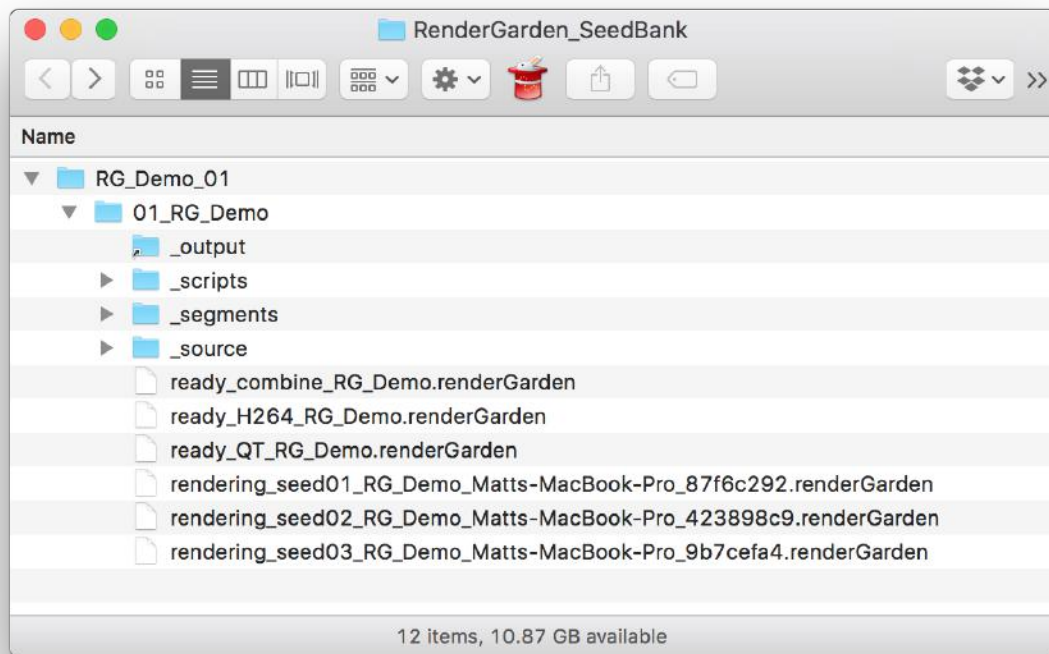


A popup allows you to choose how many more Gardener processes to launch.

- Note how many Gardeners may already be running.
  - In this case it tells us we are running 0.
- We choose 3 to launch 3 Gardners for the 3 Seeds planted.
  - The comp is then split up into three segments and each will render concurrently in three terminal/console windows.
- Every time you run RenderGarden in a session for the first time you will need to launch some Gardeners.
- After the first time you run RenderGarden in a session this popup will default to zero.
  - When Gardners finish rendering a job the terminal/console windows will stay active waiting for more seeds to be planted.
  - You can add more Gardeners at any time.
    - Once you submit, you can add more Gardeners in the dialog above.
    - You can launch more Gardeners without submitting by clicking on the “Launch More Gardeners” button below the “Plant the Seeds!” Button.
    - For network rendering, Gardeners can be launched on render nodes using the RenderGarden Gardener stand-alone Application.

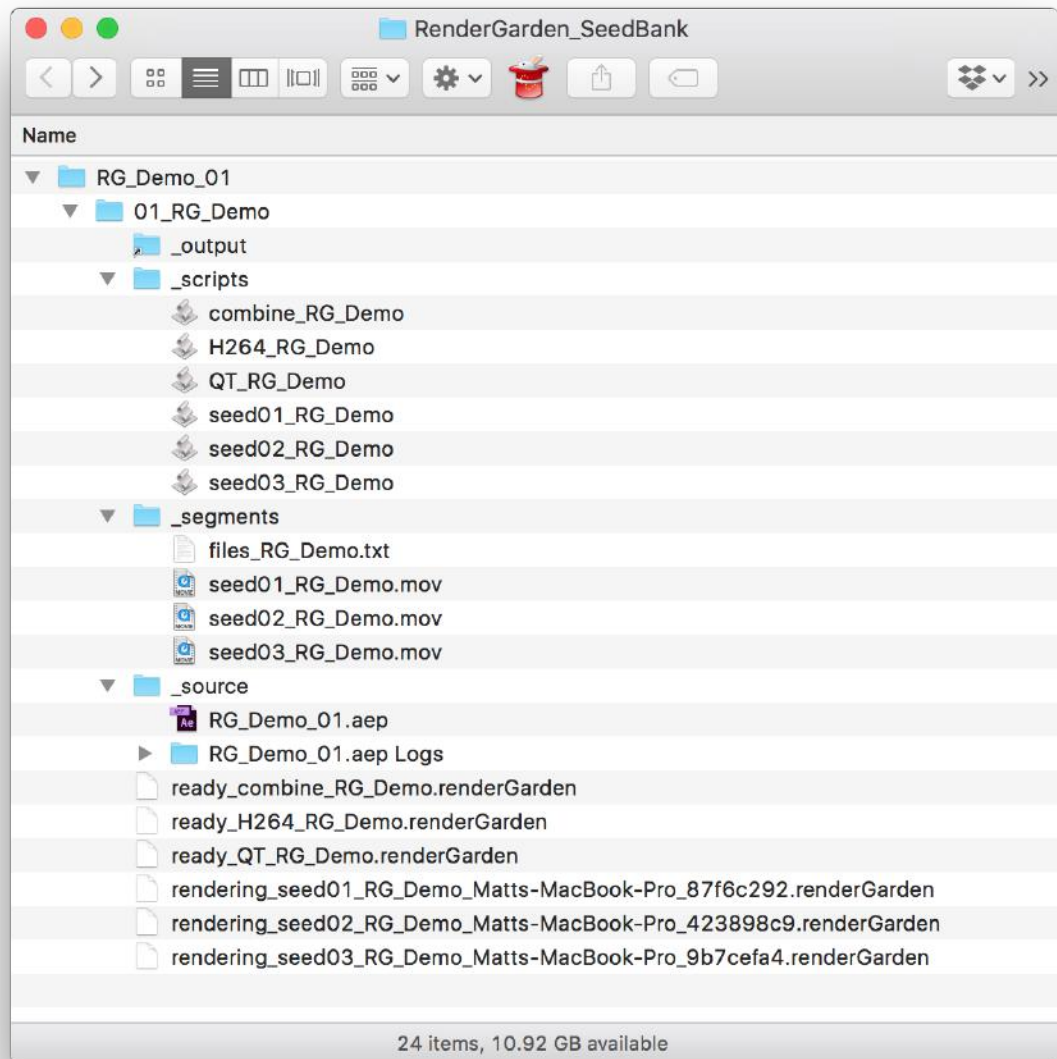


By default, Reveal Seed Bank in Finder is enabled. This opens the Seedbank folder automatically.



- Within the Seed Bank you will find four folders along with a series of .renderGarden files:
  - The .renderGarden files have a naming convention which helps you monitor your rendering progress.
    - The first part of the file name dynamically changes from Ready to Rendering to Complete so you can see the progress.
      - In this example the three seeds are rendering their QT ProRes 444 segments.
      - The FFmpeg combine script is named ready and are waiting to run as soon as all three seeds finish.
      - The two Movie Post Processing transcodes are named ready and are waiting to run as soon as the combine finishes.
    - The second part of the file name explains the process.
      - In this example we have the three seeds rendering  $\frac{1}{3}$  of the comp each, followed by the combine and the transcodes.
    - The third part of the filename specifies the comp name rendering.
      - In this example the name of the comp is RG\_Demo.

- The fourth part of the filename specifies the name of the computer which is currently rendering.
  - In this example the computer name is Matts-MacBook-Pro.
  - This is very useful for keeping track of which computer is rendering each seed when network rendering.
- The fifth part of the filename is a unique number generated for each current render.
  - The closed folders contain the following.

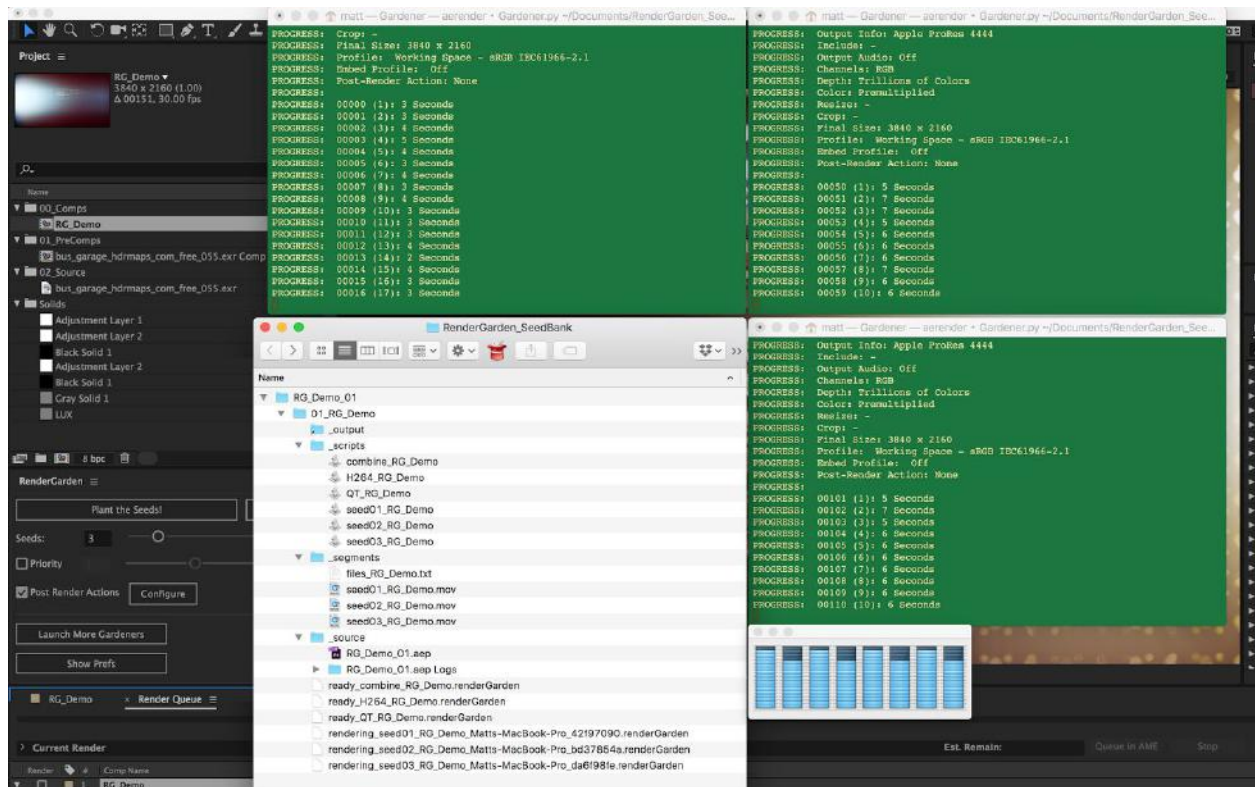


## Scripts

- Scripts are created for each seed containing the render command for that segment.
- A script is created to combine the rendered segments.
- Scripts are created for Movie Post-Processing.
- On Mac these Scripts are Applescript files.
- On Windows these Scripts are .bat files.
- When Gardener is used, these Scripts will automatically get queued to render.
  - When Gardener is not used you can double-click these Scripts to manually set off rendering.
- If a segment fails to render you can double-click these Scripts to manually re-queue the segment.
- Segments
  - These are the movie segments which RenderGarden initially renders before they are combined (concatenated losslessly) into a final movie.
  - Segments can be manually deleted when combined renders are approved.

Once the render process begins, the Terminal/Console windows may be hidden behind After Effects and will need to be brought forward if you would like to view the progress.

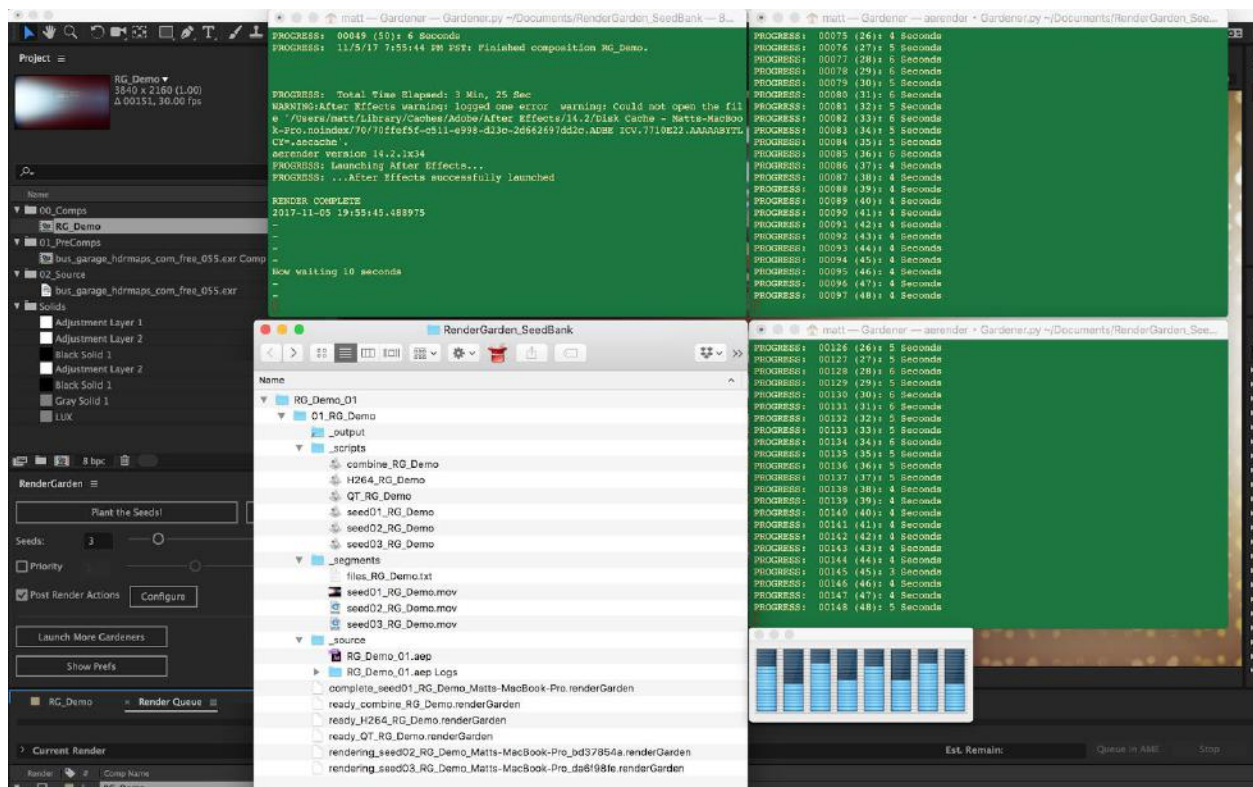
In the example below you see three terminal windows each rendering  $\frac{1}{3}$  of the comp concurrently. We also see the revealed SeedBank folder for the render, along with the OSX Activity Monitor's CPU usage.



Some things to note about the sample above:

- Some Terminal/Console windows will start rendering sooner than others.
  - The top left Terminal window started rendering frames first.
    - This picked up frames 0-49 with the frame numbers displayed to the right of the word Progress.
    - The top right Terminal window picked up the frames 50-100.
    - The bottom right Terminal window picked up frames 101-150.
  - Some comps may have sections that render very fast and other sections that render more slowly.
    - **PRO TIP:** You can balance rendering inconsistent comps by being smart about the number of seeds and number of Gardeners.
      - For example- in this case we have 150 frames, so we can plant 15 seeds but only launch 3 Gardeners. Each seed will render 10 frames per Gardener, then this same Gardener will pick up the next 10 frames.

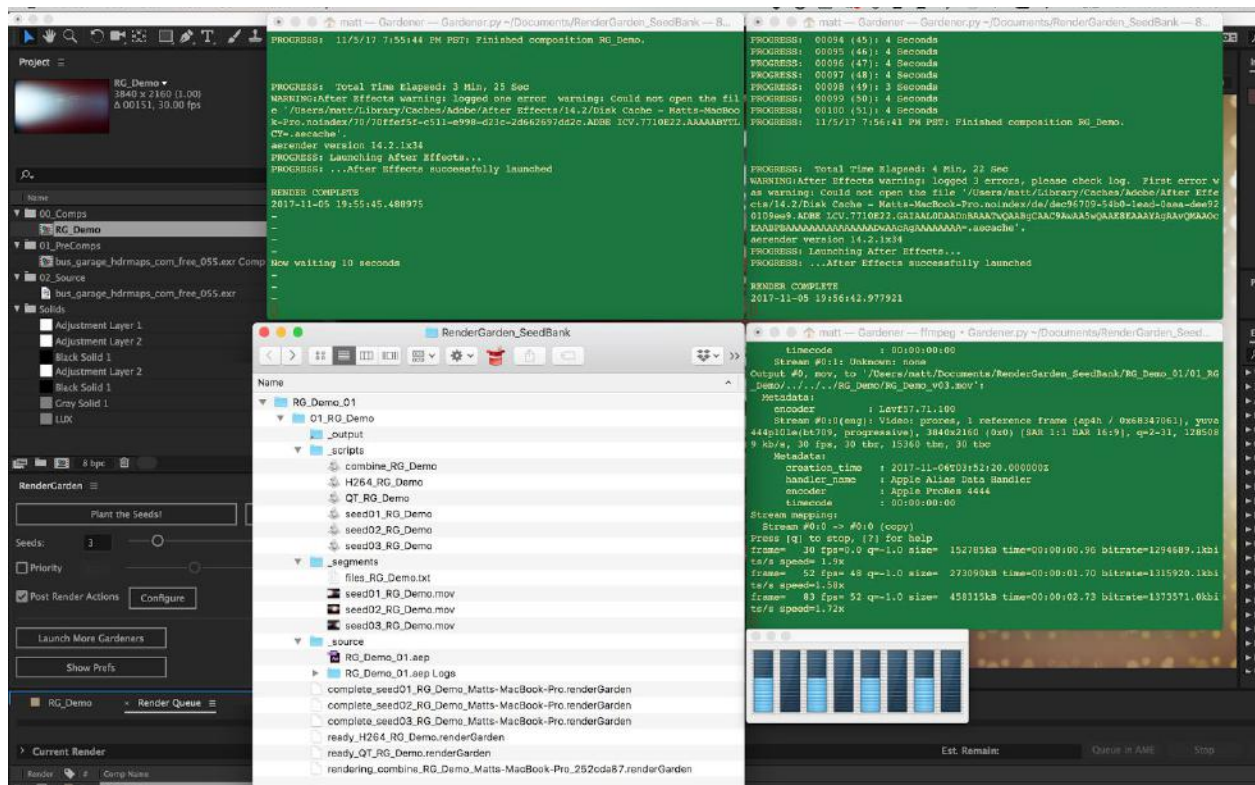
- By balancing like this we can prevent one terminal from finishing much earlier than the other two and maximize our rendering throughout the full duration.
- The Finder window reveals the SeedBank for this render.
  - Three RenderGarden filenames start with “rendering”.
    - These are the three segments rendering in the Terminal
  - Three RenderGarden filenames start with “ready”
    - One is the combiner to concatenate the three segments into one movie.
      - This will run as soon as the segments finish.
    - One is the H.264 mp4 Movie Post Processing
      - This will run as soon as the combiner finishes.
    - One is the Photo-JPEG QT Movie Post Processing
      - This will run as soon as the combiner finishes.
  - The \_ouput folder is an alias/shortcut to the final rendered movie’s directory specified in the After Effects render queue.
  - The \_scripts folder contains the six AppleScript files which get automatically run by the RenderGarden files.
  - The \_segments folder contains the three QuickTime segments currently in the process of rendering.
    - An additional text file is created for FFmpeg.
  - The \_source folder contains a backup of your After Effects project file along with the After Effects log file.
    - This backup file could cause problems on some network configurations
      - Enable the RenderGarden preference to Increment and Save if you have network issues.
- The Activity Monitor’s CPU Usage shows that the CPUs are being heavily utilized with 3 seeds.
  - This MacBook Pro has 4 physical cores, but they appear to the system as 8 virtual cores.
  - If you had more seeds rendering concurrently, you could spike the cores even more.
    - Make sure you have enough RAM in your computer to split up the cores.
      - Without sufficient RAM, renders could fail.
    - If you render more than the physical cores, you may bog your computer down to where it will not allow you to continue to work in the background.



Some things to note about the sample above:

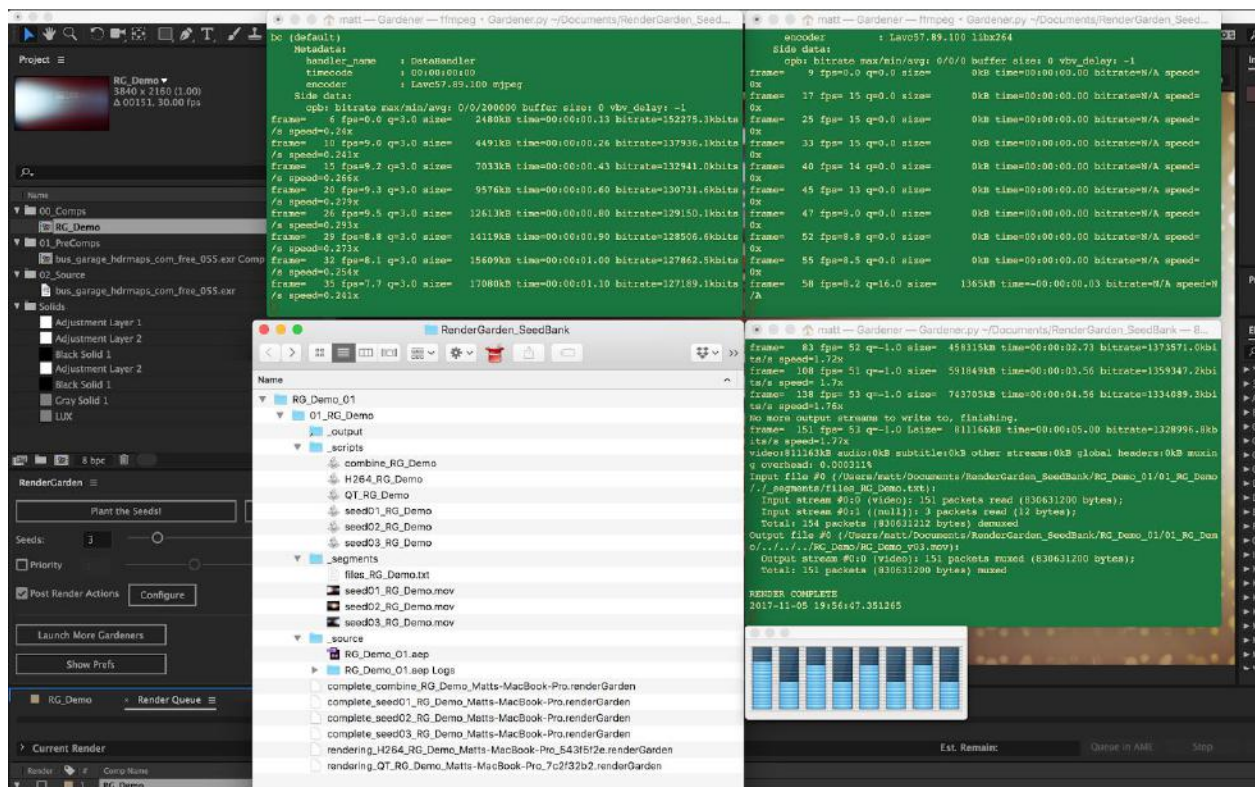
- You can see that the top left Terminal window completed its 50 frames first and is sitting idle waiting for the next seed to run while the other two terminals continue to render (both currently on frame 48).
  - Gardeners are smart and know when they need to wait for segments to finish before they combine or transcode.
  - You can leave Gardener windows running to pick up any seed planted in the folder being watched.
  - Every so often, the window will update telling you it is waiting. Sometimes it may even give you some kind words of advice.
- You can see in the Finder window that seed01's file name has changed to start with "complete".
  - The other two seeds are named "rendering".
  - The remaining combiner and transcodes are named "ready".
  - The \_segments folder contains the three Quicktime Movie segments.
    - Seed 1 is complete as evidenced by the thumbnail icon.
    - Seed 2 and 3 are still in progress as evidenced by the generic QT icon.
    - There is an additional text file which FFmpeg needs to combine the final movie.





Some things to note about the sample above:

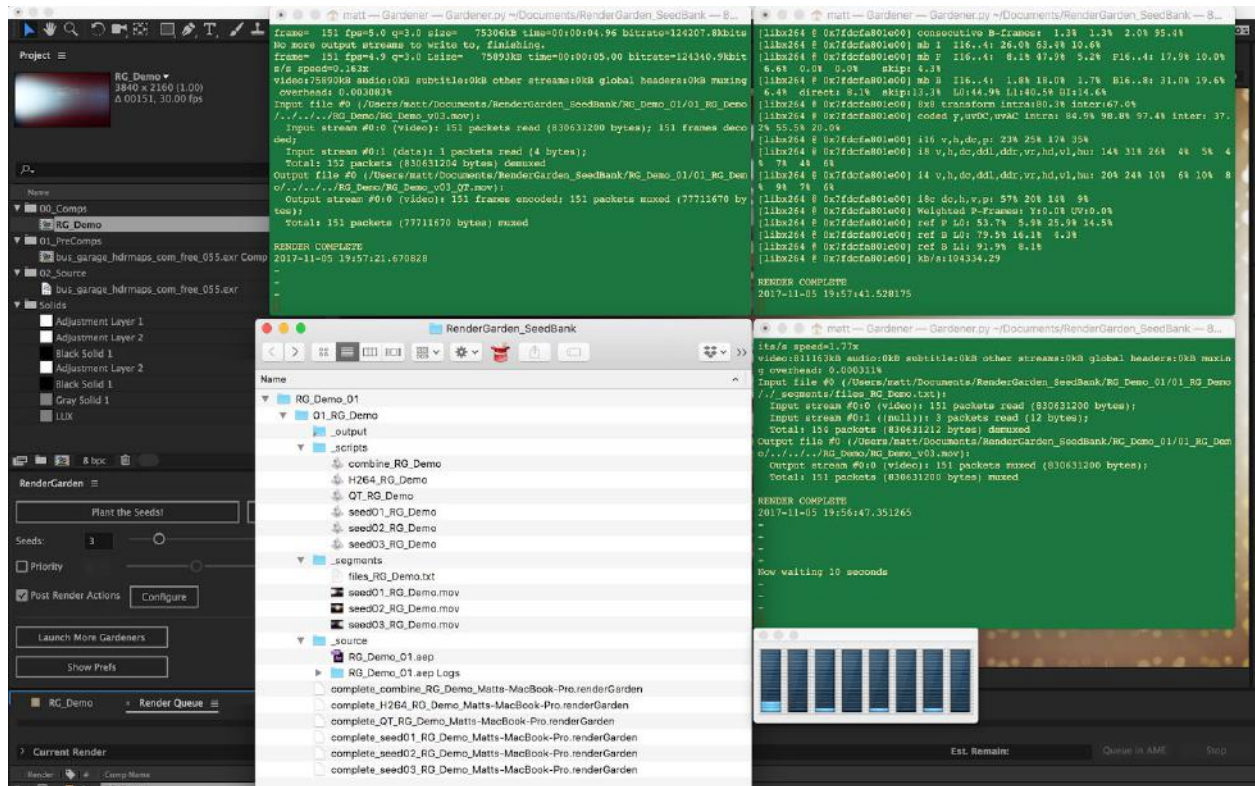
- You can see in the Finder window that the three seeds' file names are changed to "complete" and the combiner is running.
  - In the bottom right Terminal window, Gardener picked up the FFmpeg combine task.
  - The top two Terminal windows say Render Complete and Gardener is waiting for its next task.
- All three movies in the \_seed folder have thumbnail icons signifying they are complete.



Some things to note about the sample above:

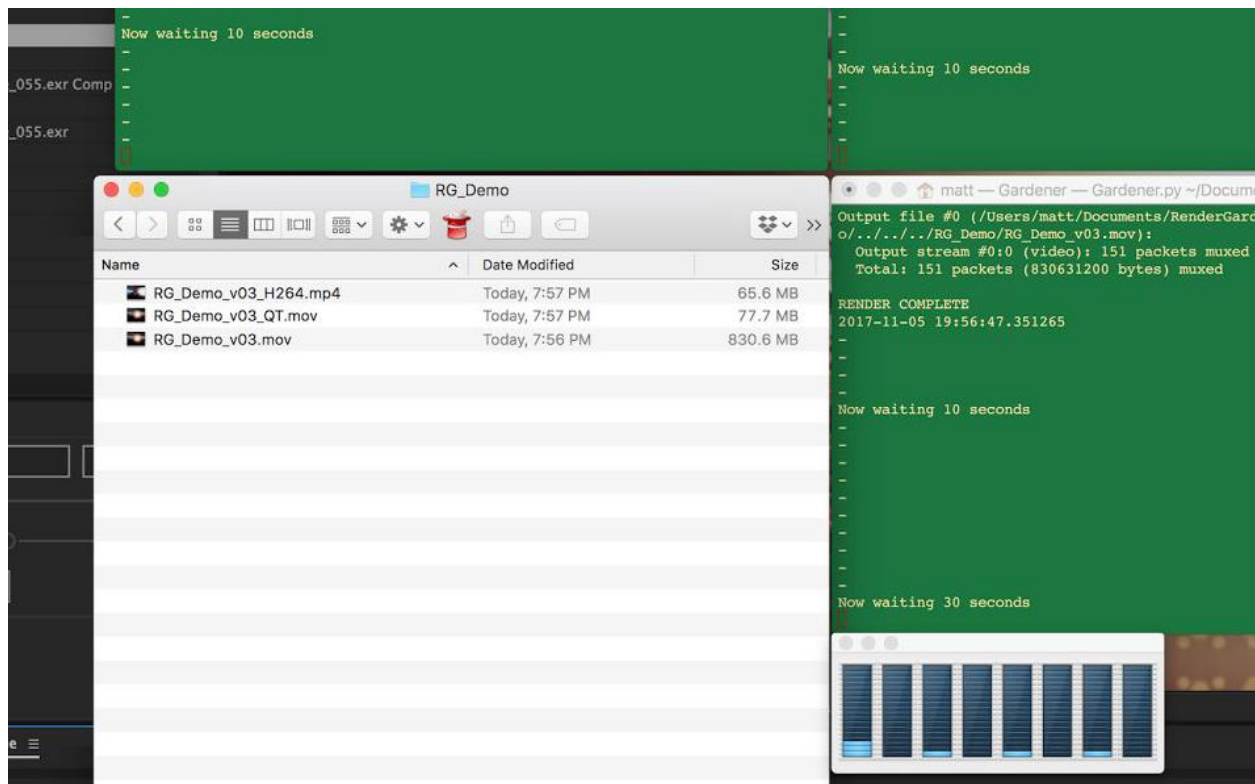
- You can see in the Finder window that the three seeds and combiner have their names changed to “complete”.
- All three movies in the \_seed folder have thumbnail icons signifying they are complete.
- The top right Terminal window is transcoding the H.264 .mp4 file.
- The top left Terminal window is transcoding the Photo-JPEG QT.
- The lower right Terminal window is sitting idle waiting for another seed to get planted.





Some things to note about the sample above:

- All renders and transcodes are complete.



Some things to note about the sample above:

- Double clicking on the \_output alias takes us to the final movies.
  - Final ProRes 4444 from the After Effects render queue is located in the folder specified in the After Effects render queue.
  - The \_QT file is the Photo-JPEG QT transcoded from the ProRes 4444 render.
  - The .mp4 file is a 2-pass H.264 transcoded from the ProRes 4444 render.

## Network Rendering – Overview

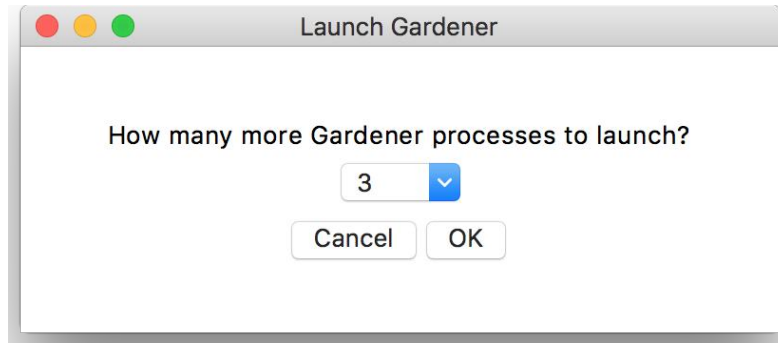
Each RenderGarden license gives the user the ability to use the After Effects submit script on one computer, however, you can run the stand-alone Gardener application on an unlimited number of render nodes.

## Network Rendering – Installation

- To install the stand-alone Gardener application, in the RenderGarden installer select:
  - Gardener (For Render Nodes)
  - On Mac we recommend installing AEpesticide
    - AEpesticide is used to kill stuck aerendercore processes which may occur with numerous background aerenders running.
    - Run AEpesticide if you are having render failures.
      - If failures persist reboot the computer.
  - For After Effects to render, you must have a version of aerender installed.
    - The aerender command-line application is installed by default by Creative Cloud in the Adobe After Effects folder.
      - If Creative Cloud is licensed on the render node aerender will automatically work.
      - If Creative Cloud is not licensed on the render node, you can run an unlimited number of render nodes by making After Effects run in “Render Engine” mode.
        - Install After Effects on the render-only machine.
        - Place a blank file named ae\_render\_only\_node.txt into one of the following locations, depending on the user account type:
          - Mac OS:
            - /Users/[username]/Documents/
            - /Users/Shared/Adobe/
          - Windows:
            - C:Users/[username]/My Documents
            - C:Users/Public/Public Documents/Adobe
  - For more information on Render Engines for After Effects go to:
    - <https://goo.gl/AJU2Hv>

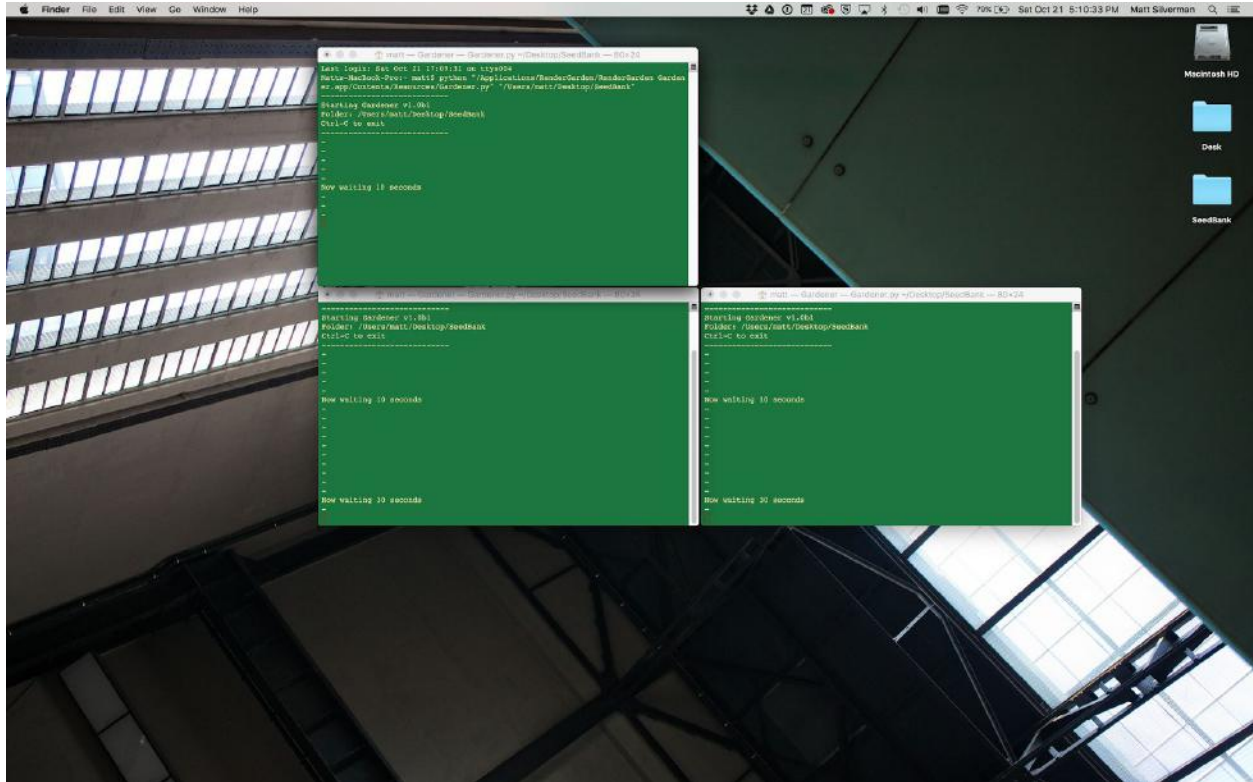
## Network Rendering – Launching Gardeners on Render Nodes

To Launch Gardeners on Render Nodes, launch the RenderGarden Gardener application.



A Python script is launched bringing up the small dialog seen above.

- Note that this window may be hidden behind your other applications in the background.
- Choose the number of Gardener Processes to launch on your render node.
  - When you select "OK", a save dialog will open asking you to choose the location of the Seedbank. You must select the same seed bank folder you chose in the After Effects submit script and all other render nodes. Currently this folder must be on a dedicated server (we're hoping to fix this very soon).



In the example above, selecting 3 will open three terminal windows on this render node.

- Leave these Terminal/Console windows open and running in the background. Gardener will wait for any planted seeds to be added to the SeedBank to start rendering.
- The number of seeds combined on all render nodes will dictate the number of seeds you should plant in the After Effects submit. For example-If you have four computers, each with 10 Gardeners running, you would submit 40 seeds.

## Network Rendering – Server Setup

RenderGarden's network rendering functionality requires that the computer submitting the project and the render nodes must all be able to have read/write access to:

- The After Effects project file (.aep).
- All source footage used in the project.
- The output directory set in the Render Queue.
- The RenderGarden SeedBank folder.
- Additionally FFmpeg and Python must be installed on every render node.