

Color Models (RGB vs CMYK)

A **color model** is an abstract numerical system for describing color, using three or four main numbers to represent primary colors. RGB and CMYK are the two main color models that you need to be familiar with.

RGB color model

The RGB color model is an additive color model, used for **all media that transmit light** (e.g. computer monitors, phones). Digital media emit color as RGB (Red, Green, Blue) light.



Additive means that the more RGB light beams emitted, the closer you get to white. If no light is emitted

(RGB 0 0 0) you will see black. If maximum light is emitted (RGB 255 255 255) you will see white. RGB values range from 0 to 255.

CMYK color model

The CMYK color model is a subtractive color model, used for **print**. Printers print with CMYK (Cyan, Magenta, Yellow, Black) ink; no matter what color model your digital file is, it will be converted to CMYK in order to be printed.



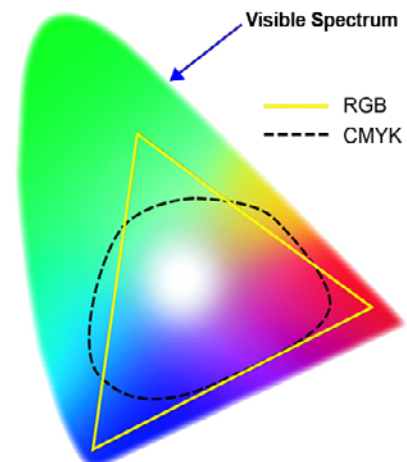
Subtractive means that the more ink added, the closer you get to black. Different color inks absorb and reflect specific wavelengths. CMYK 0 0 0 0

looks like white (no ink laid down means no light is absorbed), whereas CMYK 0 0 0 100 looks like black (maximum black ink laid down means all colors are absorbed). CMYK values range from 0% to 100%.

RGB vs CMYK Color Gamuts

All color models can only display a **limited gamut** (range) of colors compared to the actual visible spectrum of color.

RGB has a wider gamut than CMYK, which means that not all RGB colors can be reproduced in CMYK (i.e. **not all colors on screen can be reproduced in printed ink**). The difference in gamut is most noticeable when dealing with very bright, vibrant colors. The neon colors you can get on a computer monitor cannot be reproduced when printing with normal CMYK ink on paper, because while digital media emits light, ink on paper does not.



Color Spaces

A **color space** is a specific implementation of a color model. There are many RGB and CMYK color spaces, and each one has a different gamut. The two main color spaces you should be familiar with are Adobe RGB and sRGB.

sRGB (standard RGB) is an older standard, and almost every screen uses sRGB as their color space. sRGB should be used for **images that appear on the web**. Most monitors can display almost all of the sRGB color space, so this is a safe option for digital media.

Adobe RGB has a wider gamut than sRGB, meaning images in the Adobe RGB color space can have a wider range of colors. However, most monitors cannot display all of the Adobe RGB gamut! So Adobe RGB images viewed on the web likely look worse than sRGB images, because there will be color loss when the browser converts the Adobe RGB image to sRGB. However, many inkjet printers have adapted the Adobe RGB color space, meaning they can reproduce colors out of the sRGB gamut, so it is recommended to **keep for-print images in Adobe RGB**.

Color profiles define the specific color space (e.g. Adobe RGB) of a document or device. The terms color profile and color space are often used interchangeably.

For more detailed information on color settings, visit the Adobe support site:

http://help.adobe.com/en_US/creativesuite/cs/using/WS6A727430-9717-42df-B578-C0AC705C54F0.html



Color Management Workflow at DMA

There are multiple approaches to color management when working with print media files. Some print houses ask designers to submit RGB files, while others want CMYK. It depends on both the type of printer and their particular workflow.

The purpose of having a good color management workflow is so that what you see on your screen will translate as close as possible to what you see printed!

When printing on the laser and inkjet printers at DMA, it is best to submit RGB files. This is because the native Epson and Canon drivers prefer handling RGB data, and our printers can basically be treated as RGB devices (though they print with CMYK inks). If you were to use third-party RIP software, CMYK data would be preferred.

Here is the recommended approach for color management when printing at DMA. Detailed instructions for specific programs follow.

1. Work in RGB

As mentioned before, sending RGB data to the printers at DMA is preferred. Create new documents in RGB mode; use the Adobe RGB profile for print documents, and use sRGB if your document is only for web/digital screens. It is important to remember that your RGB colors may not exist in the CMYK gamut, which is why soft proofing, explained next, is important.

2. Soft proof on a calibrated monitor

Soft proofing lets you preview on screen what your final printed output will look like, IF your monitor is properly calibrated and you are using the correct printer profile (specific to the paper and printer you will be using). This is an important step because it shows you approximately how your RGB colors will translate to CMYK ink!

3. Print on proper paper with correct profile

Specifying the correct printer/paper profile means your file will be converted to CMYK in the best way possible, for the specific paper type and printer you are using. Not all papers have profiles created for them, so in that case you should choose the closest match to your paper and adjust your colors as needed.

Installing Printers: HP LaserJet 5550 (Spasky, Fisher)

Installing the Driver (Mac)

1. Download driver from the DMA Support site

Lab Info > Downloads


Click “HP 5550 Printer Driver”

2. Install the Driver

Unzip the .gz file (double click it)

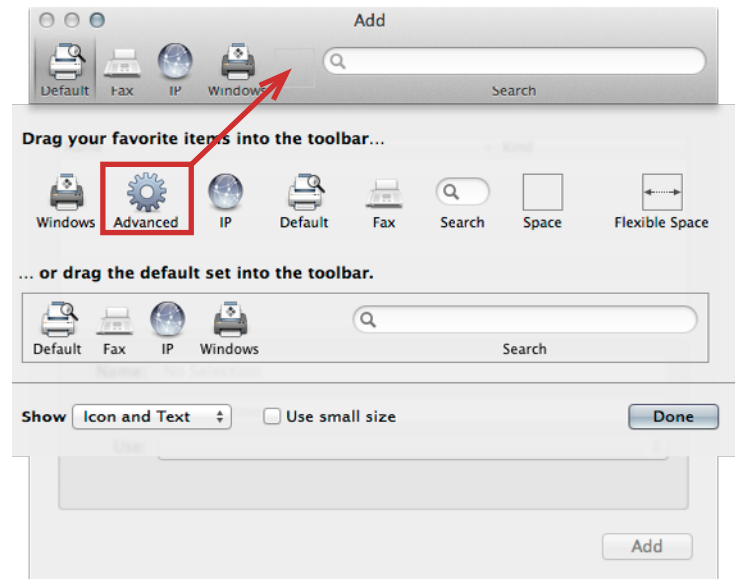
Perform a software update (Apple > Software Update)

Adding the Printer

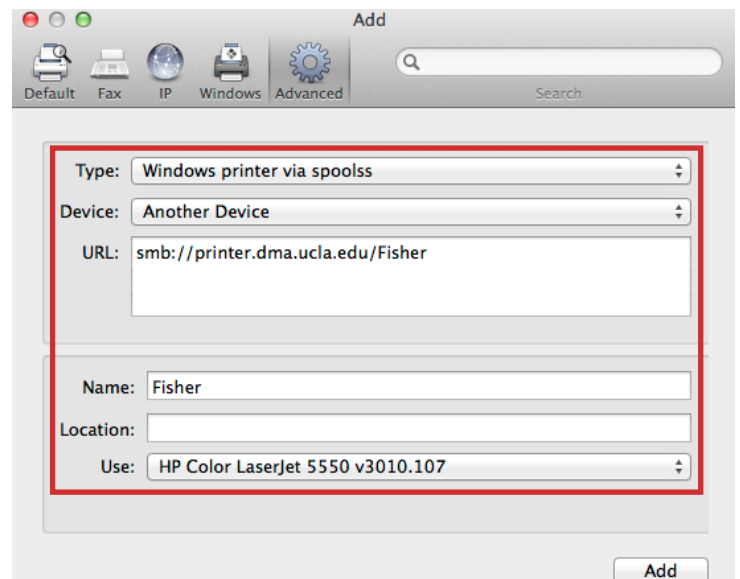
1. Open System Preferences > Printers & Scanners and press the  to add a new printer.

2. If the Advanced icon (gear) is not in the toolbar, right-click the toolbar, select “Customize Toolbar”.

Then drag the Advanced icon to the toolbar.



3. Click the Advanced icon and input the following.



For “Use”, choose “Select Software...” to search for 5550. Lastly, press **Add** to finish.

Installing Printers: Epson Stylus Pro 4900 (Buzz)

Installing the Driver

1. Download the driver from Epson.com

Drivers & Support > Printers & All-in-ones

Search for Epson Stylus Pro 4900, click it

Click “Drivers & Downloads”

Click “Download”

2. Install the Driver

Open the downloaded DMG and follow the instructions to install the printer driver.

EPSON
EXCEED YOUR VISION

PRODUCTS | INK | PAPER | **DRIVERS & SUPPORT** | EXPLORE EPSON | E

Sign In | Track My Order | My Account | Reorder List | Product Registration

Home > Support > Epson Stylus Pro 4900 Printer > Drivers & Downloads

Get Important Product Updates & Special Offers

Email Address (Required) | First Name (Optional)

Epson Stylus Pro 4900 Printer

Drivers & Downloads


Operating System: Mac OS X 10.9.x (detected)

Visit our Epson Stylus Pro 4900 **ICC Profile Downloads** page for access to Premium ICC profiles produced by Epson America, Inc.

Drivers

Printer Driver v9.17 +
11/01/13 | 65.9 MB | epson15902.dmg **Download**

Adding the Printer

1. Open System Preferences > Printers & Scanners and press the  to add a new printer.

2. If the Advanced icon (gear) is not in the toolbar, see instructions on pg. 7.

3. Click the Advanced icon and input the following. For “Use”, choose “Select Software...” to search for EPSON SPro 4900. Lastly, press **Add** to finish.

Add

Default Fax IP Windows **Advanced** Search

Type: Windows printer via spoolss

Device: Another Device

URL: smb://printer.dma.ucla.edu/Buzz

Name: Buzz

Location:

Use: EPSON SPro 4900

Add

Printer Settings: HP LaserJet 5550 (Spasky, Fisher)

Print Dialog Settings

1. Paper Size:

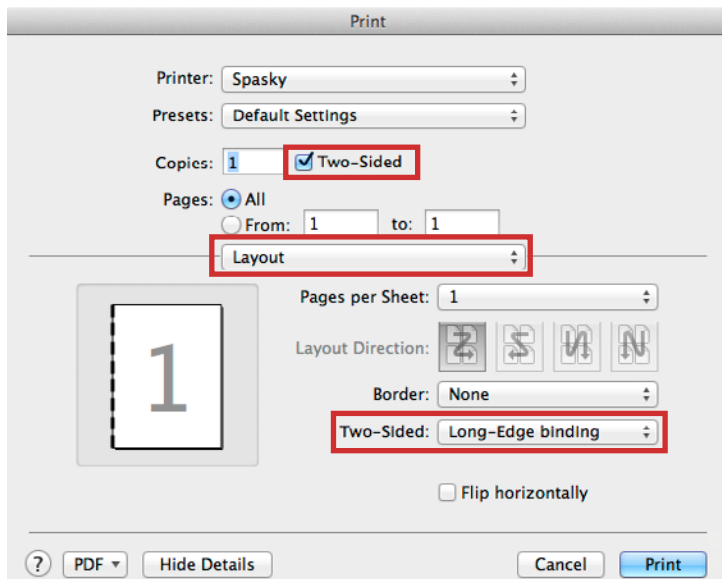
Select the correct paper size.

2. Layout:

Choose the following to print double-sided:

Check **“Two-Sided”**

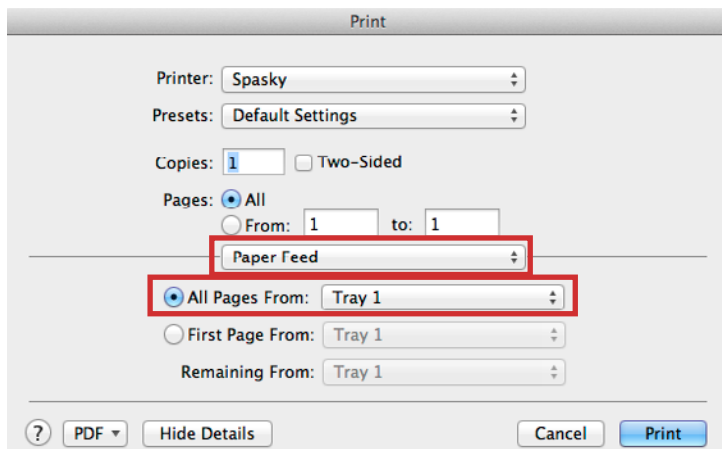
Two-Sided: Long-Edge Binding or
Short-Edge Binding



3. Paper Feed:

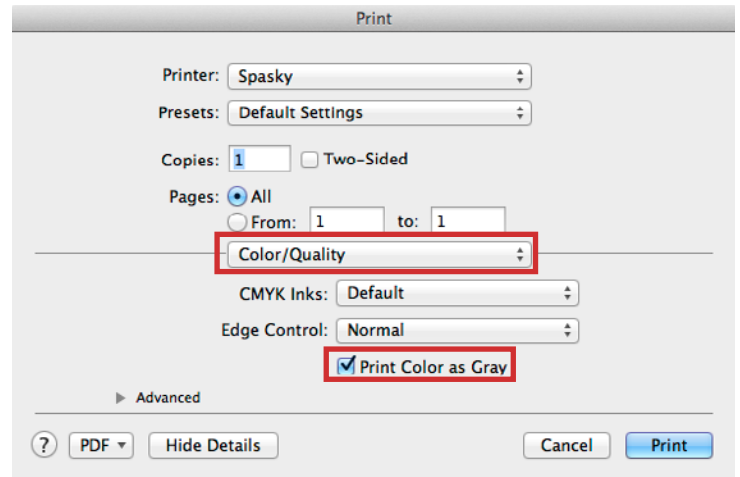
If you are printing on custom paper, choose

All Pages From: Tray 1



4. Color/Quality:

To print a black and white document, make sure to check **Print Color as Gray**.



Inserting Custom Paper

1. To print on your own paper, first **lower Tray 1**.
2. **Slide the tabs to fit your paper**. For letter and tabloid paper, slide the tabs to 11”.
3. **Insert your paper onto the tray**. For letter paper, place the paper so the long edge is parallel to the printer. For tabloid paper, place the paper so the short edge is parallel to the printer (the paper will stick out from the tray).

Custom Paper Settings

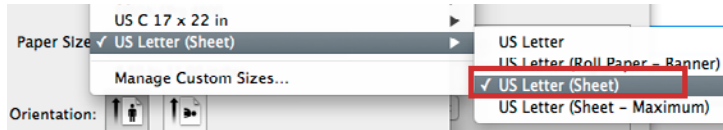
to be added

Printer Settings: Epson Stylus Pro 4900 (Buzz)

Print Dialog Settings

1. Paper Size:

Make sure you select the **(Sheet)** option for your paper size.



2. Printer Settings:

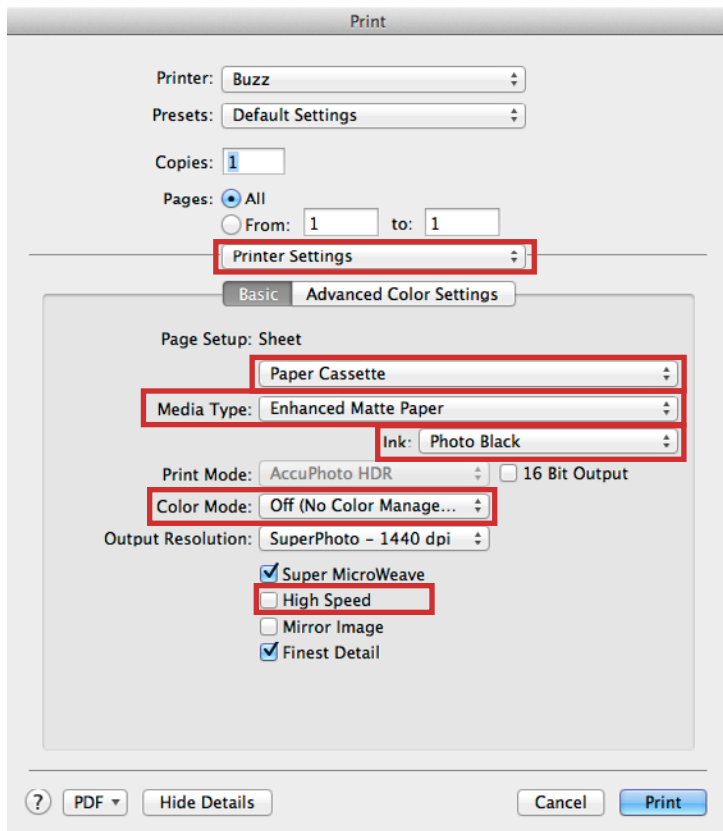
Choose the following:

Paper Cassette

Media Type: (your paper)

Ink: Photo Black

Color Mode: Off (No Color Management)



Inserting Paper



Insert paper into the paper cassette **face down**, and push the tray all the way in to begin printing.

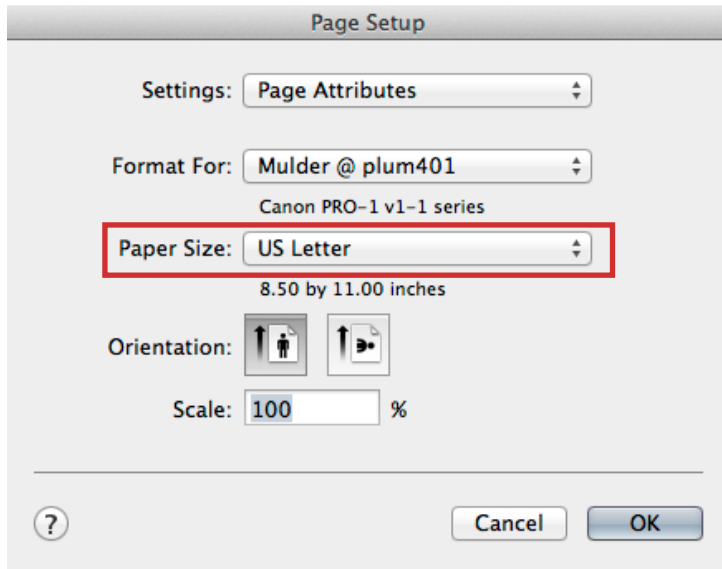
If you don't see the Paper Cassette option, you didn't set your paper size to Sheet.

Printer Settings: Canon Pixma Pro-1 (Mulder, Scully)

Print Dialog Settings

1. Paper Size:

Make sure you select the correct paper size.



2. Quality and Media:

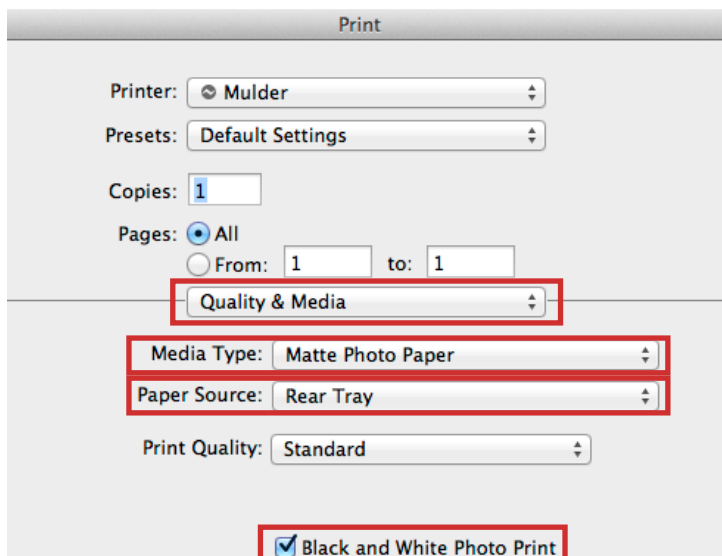
Choose the correct media type and source.

Media Type: (your paper)

Paper Source: Rear Tray

(Manual Feed if thick paper)

Check “Black and White Photo Print” to print in only black/grey inks.



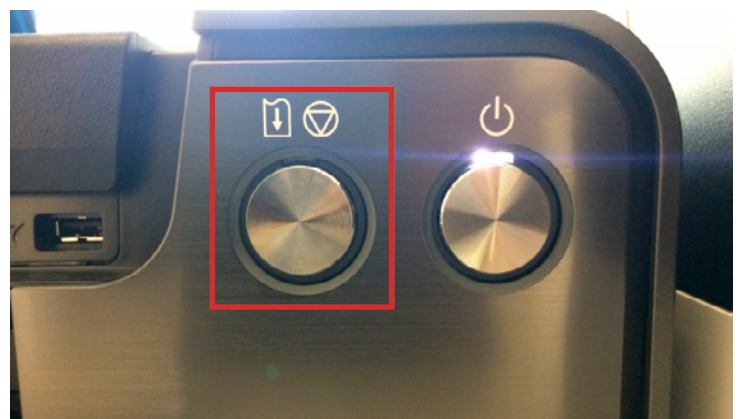
Inserting Paper (Manual Feed)



1. The **Manual Feed** is behind the **Rear Tray**.



2. Move the gray tabs to fit your paper size.



3. When you print a manual feed job, after you hit Print you need to press the “Resume” button on the printer. It is the left button and should be flashing orange when it needs to be pressed.

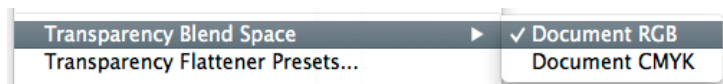
InDesign Workflow

Document Setup

1. Transparency Blend Space:

Edit > Transparency Blend Space >

Document RGB



2. Color Settings:

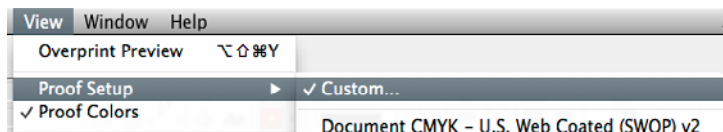
to be added

3. Assigning/Converting Profiles:

to be added

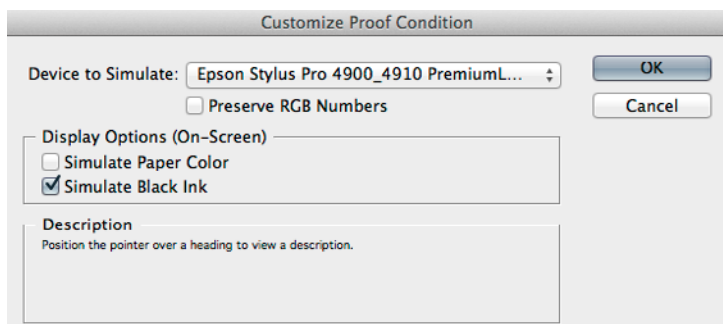
Soft-Proofing

1. Go to View > Proof Setup > Custom...



2. Customize Proof Condition:

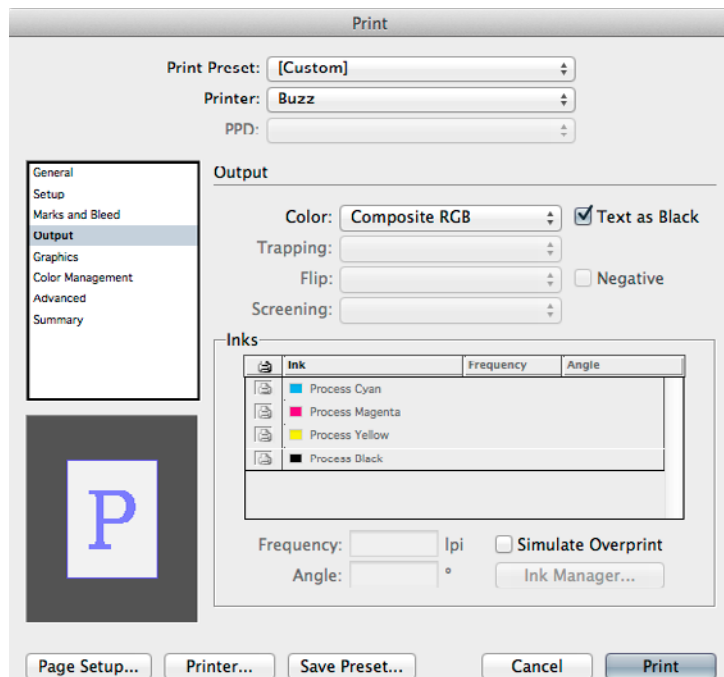
- A. Choose the profile for your **final output** printer and paper.
- B. Uncheck "Preserve RGB Numbers"
- C. Check "Simulate Black Ink" to see how your blacks will look when printed (ink is not as deep black as on screen).



Print Settings

1. Output pane:

Choose **Color: Composite RGB**



2. Color Management pane:

- A. **Print:** check **Document** (should be Adobe)
- B. **Color Handling:** Let InDesign Determine Colors
- C. **Printer Profile:** choose the profile for the specific printer and paper you are going to be printing on.

