Essential Graphics/Design Concepts for Non-Designers

presented
by

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Discussion topics

- What is resolution?
- Understanding graphic/image formats (TIFF, JPG, EPS, etc.)
- What are good and bad image sources?
- What are CMYK and RGB?
- What is the difference between linked vs. embedded images/graphics?
- What are bleeds?
- When should you start thinking about binding your document?
- Tips to organize your electronic files
- Why are PDFs so important for printing?
- Basic design principles: legibility, alignment, repetition, and contrast

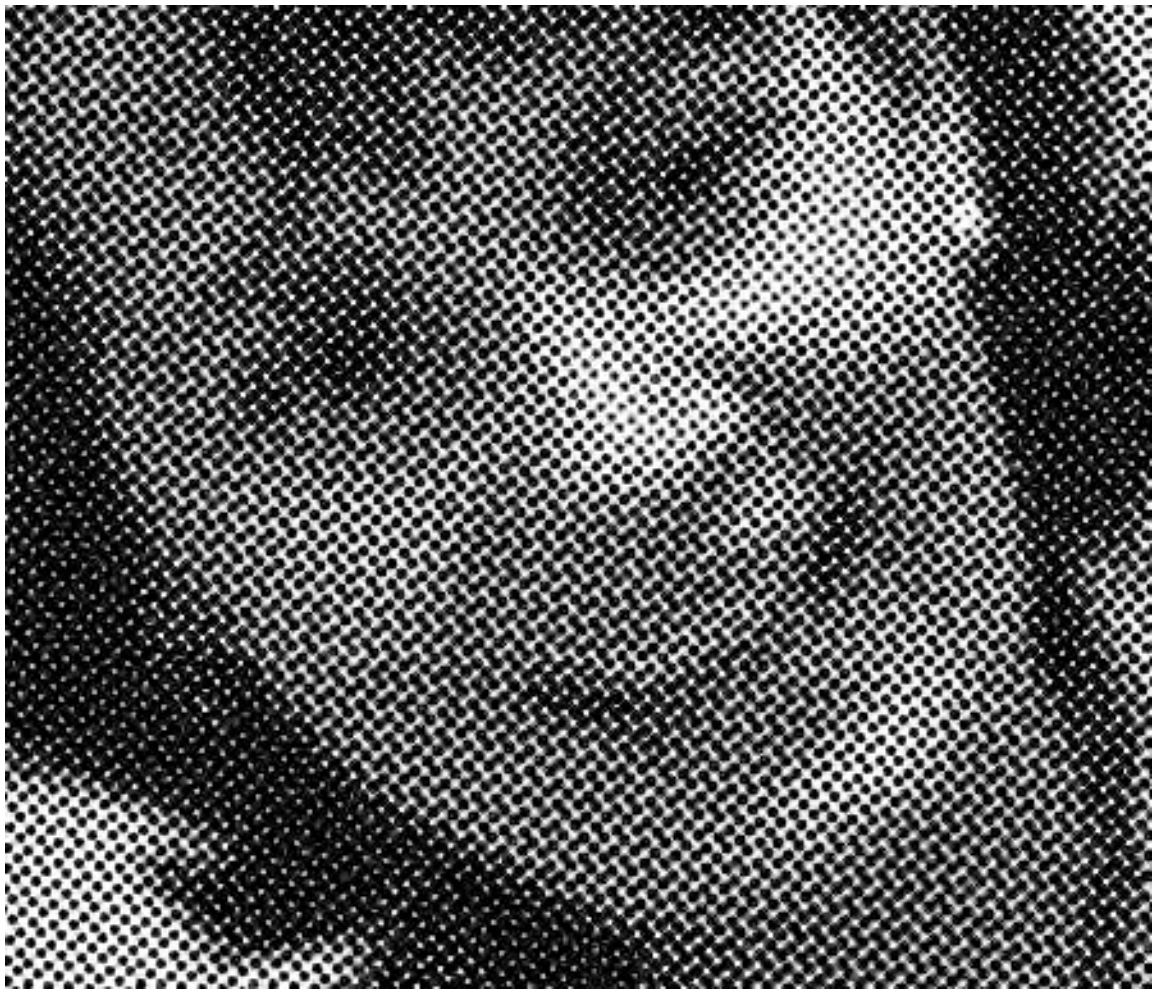
Resolution

- The amount of information or pixels contained in an image.

- Resolution is measured in DPI (**dots per inch)** or PPI (**pixels per inch)**. These are literally the number of dots or pixels that can be placed side by side in a line one inch long. The more dots or pixels, the better the clarity – the higher the resolution – of the image.

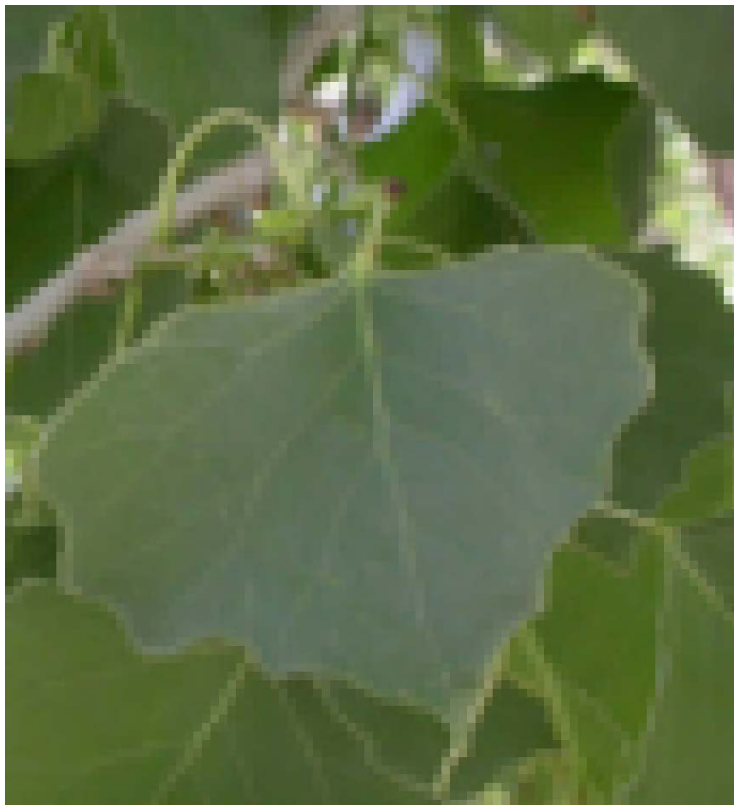
Dots Per Inch (DPI)

The image on the right shows you the actual DOTS that are used to print a photograph on a printing press.



Resolution: Why is it SO important for printing?

high resolution

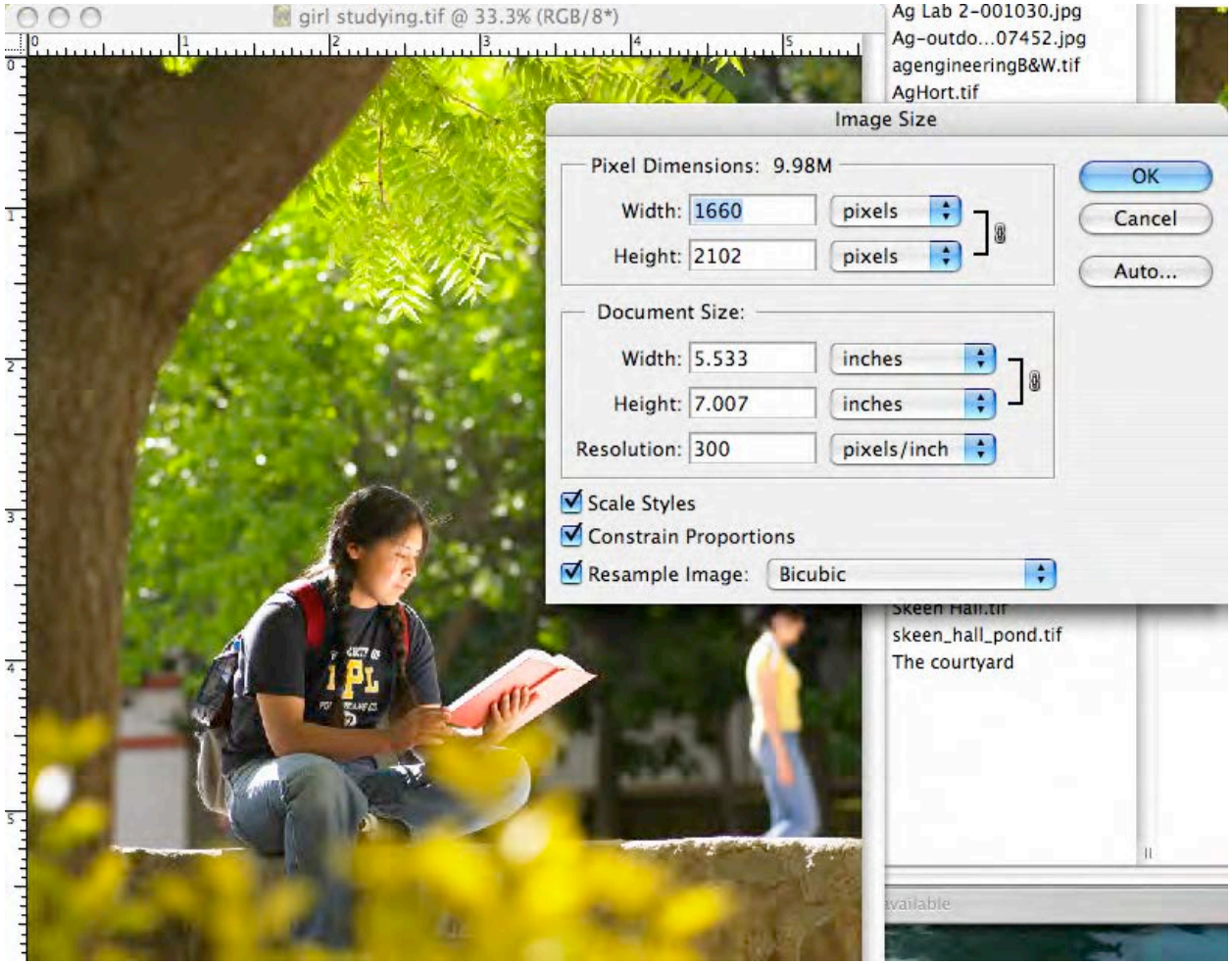


low resolution

Resolution: How do you know when an image has high resolution?

Tip 1:

Photoshop,
a photo editing software, allows you to open the image file and look up the resolution. It should be 300 dpi or higher.



Resolution: What if you don't have Photoshop?

Tip 2: Image is probably low resolution:

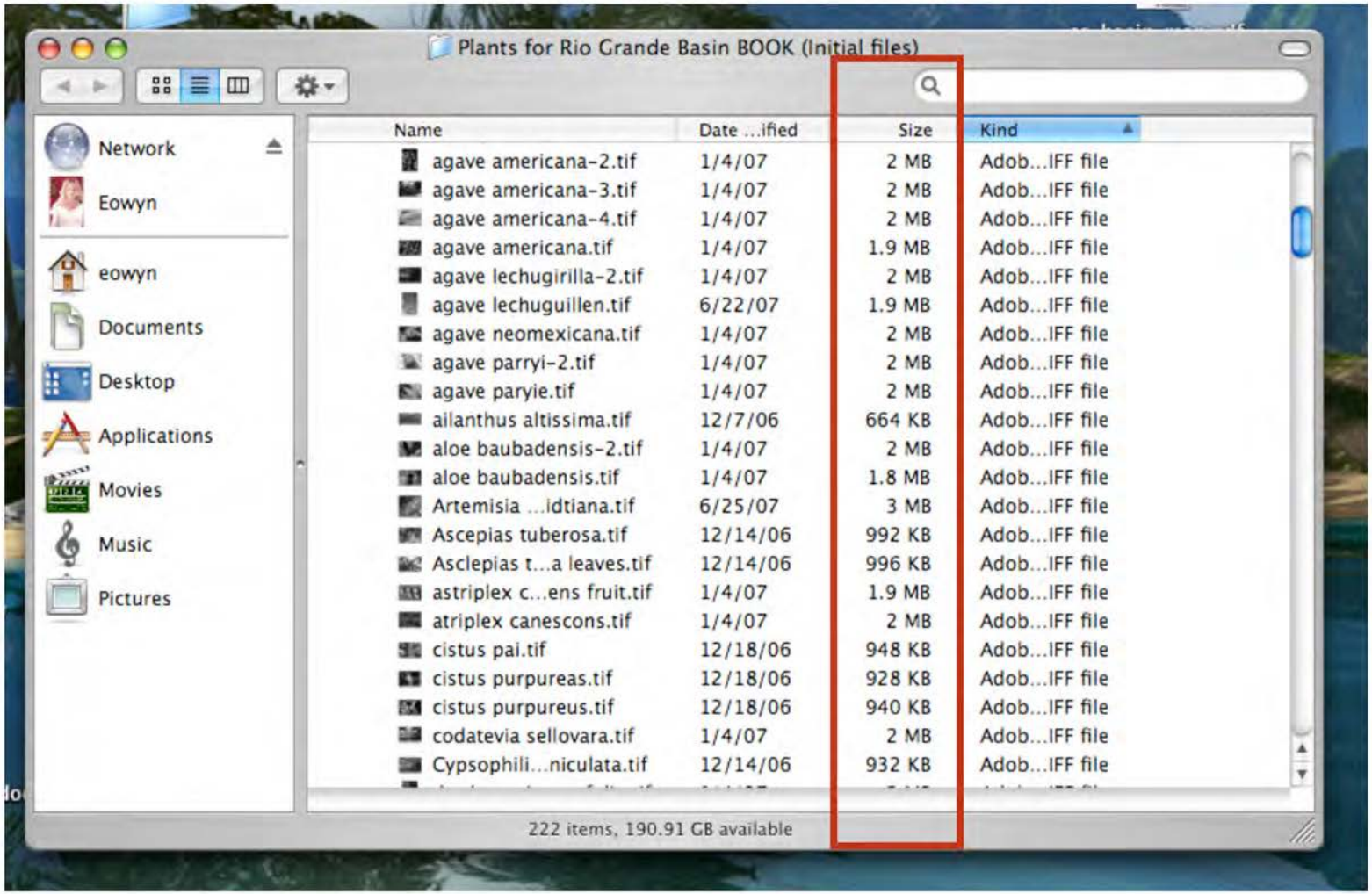
- if the placed or inserted image is SO small you have to enlarge it.
- if the image's file size is smaller than 500KB (kilobyte).

Tip 3: Image is probably high resolution:

- if the placed or inserted image fills the page
- if image is at least 1MB (megabyte)

Tip 4: PC users can right-click an image then choose "properties" to see resolution.

Resolution: Where can you find file size?



Understanding Image formats

- **Raster images** (TIFF, JPEG, GIF, PNG, PICT, BMP): These types of images are composed of pixels and are dependant on resolution for clarity (photos, line art, etc.)

- **Vector images** (EPS): These types are images are not dependant on resolution and can be enlarged without distortion.

Vector Image

Vector image with anchor points

This example shows you how you can modify a vector file by extending some of the anchor points.

Good sources of image files

- **Digital camera images** set at the highest resolution setting.

- **Slides or photos** that you can scan yourself. (**Tip:** Scan at 300 dpi and scale [enlarge] images to final desired size during scanning stage.)

- **Downloadable high resolution images.** (Always remember to look into copyright permission when using photos produced by a third party.)

Scanning tips

- When scanning line art or text, set your scanner to black/white, **NOT** grayscale. Image will print much more clearly.

- Scan photos/slides at 300 dpi and line art at 900 dpi.

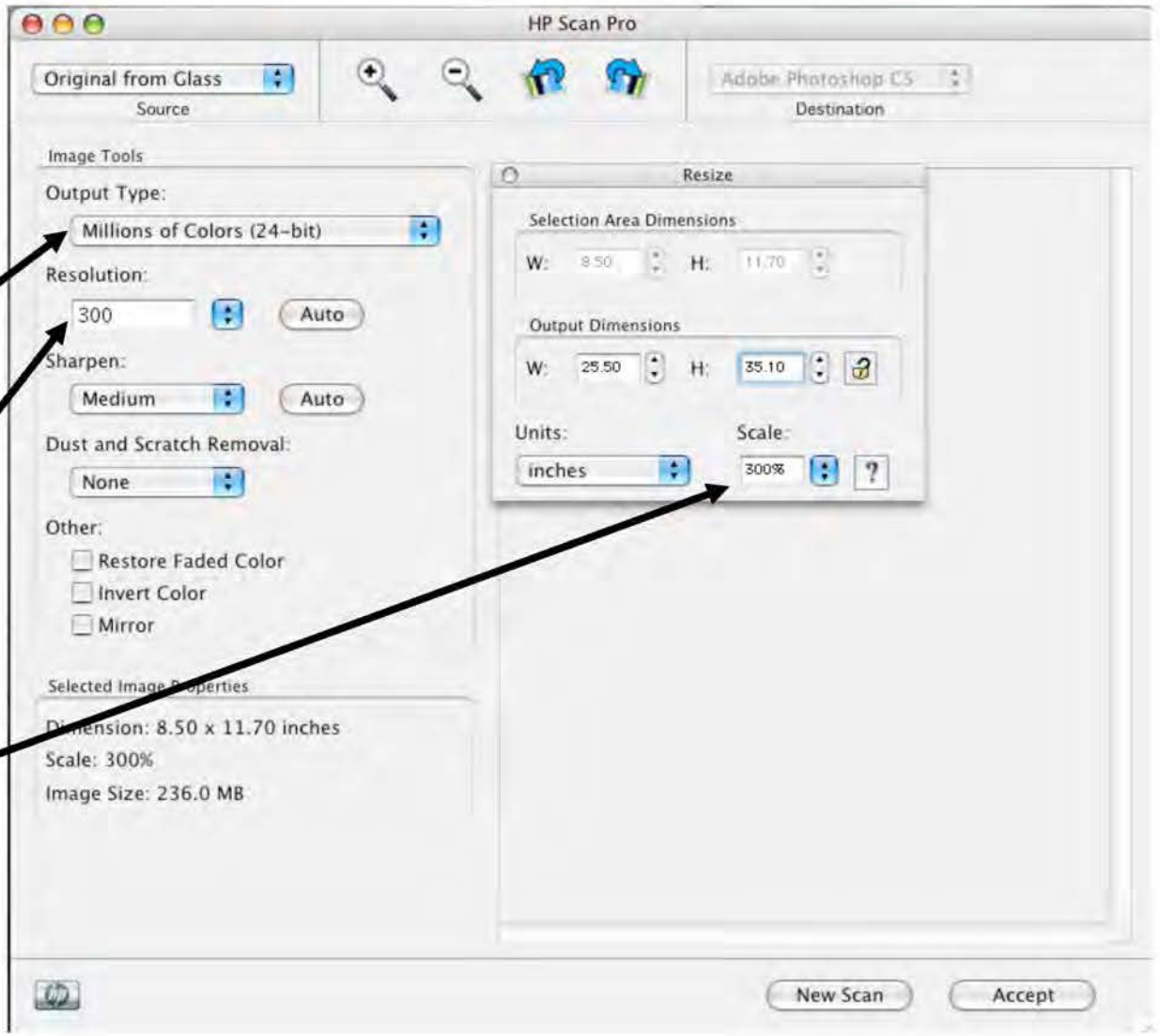
- **Scale (enlarge) your images at this stage.**
  Ex: If you have to scan a slide, scale (enlarge) it up to 300%. That will enlarge the image to 3 times its original size at 300dpi so it will be **BOTH clear and larger**.

Typical Scanning Setup

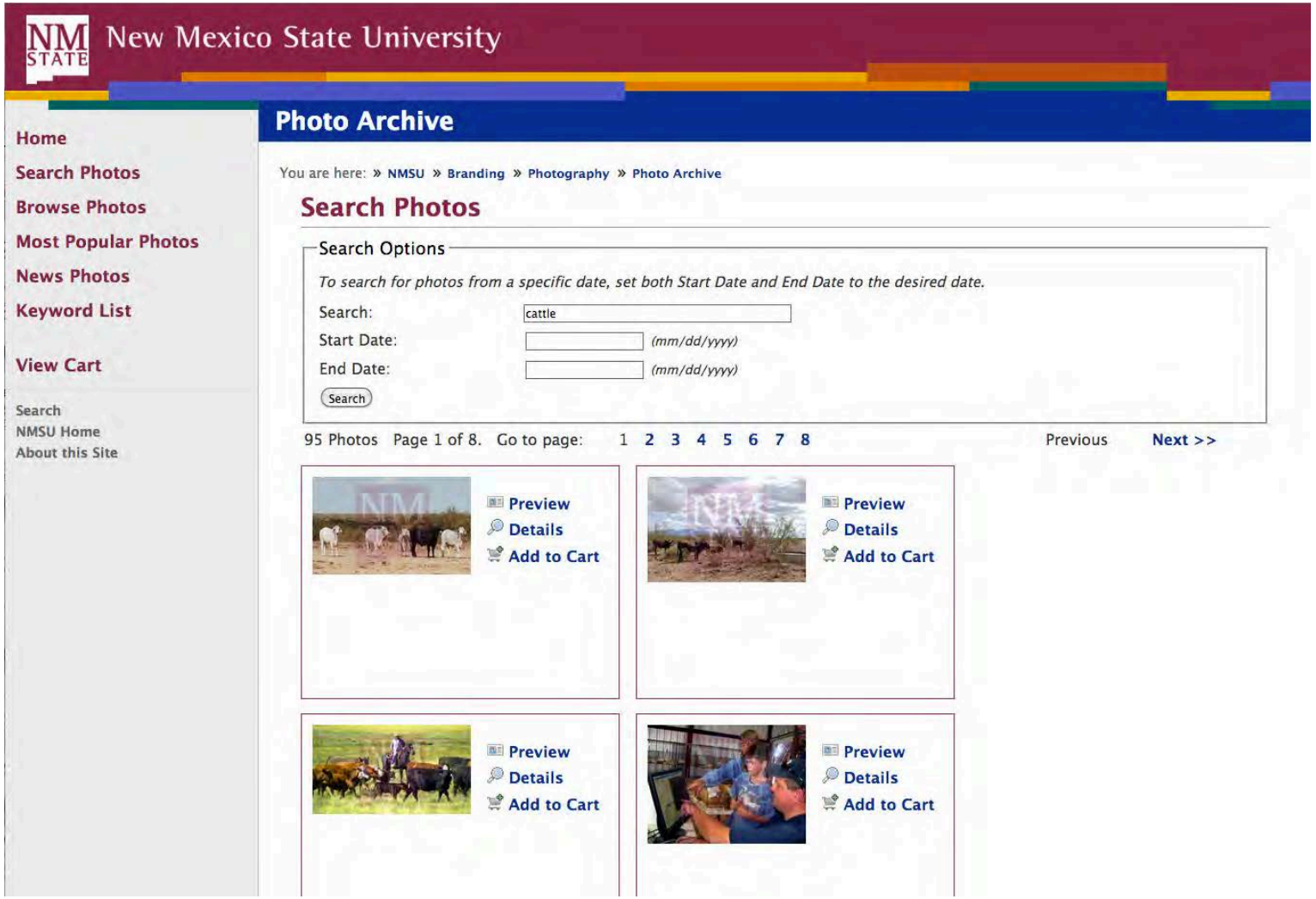
Output type

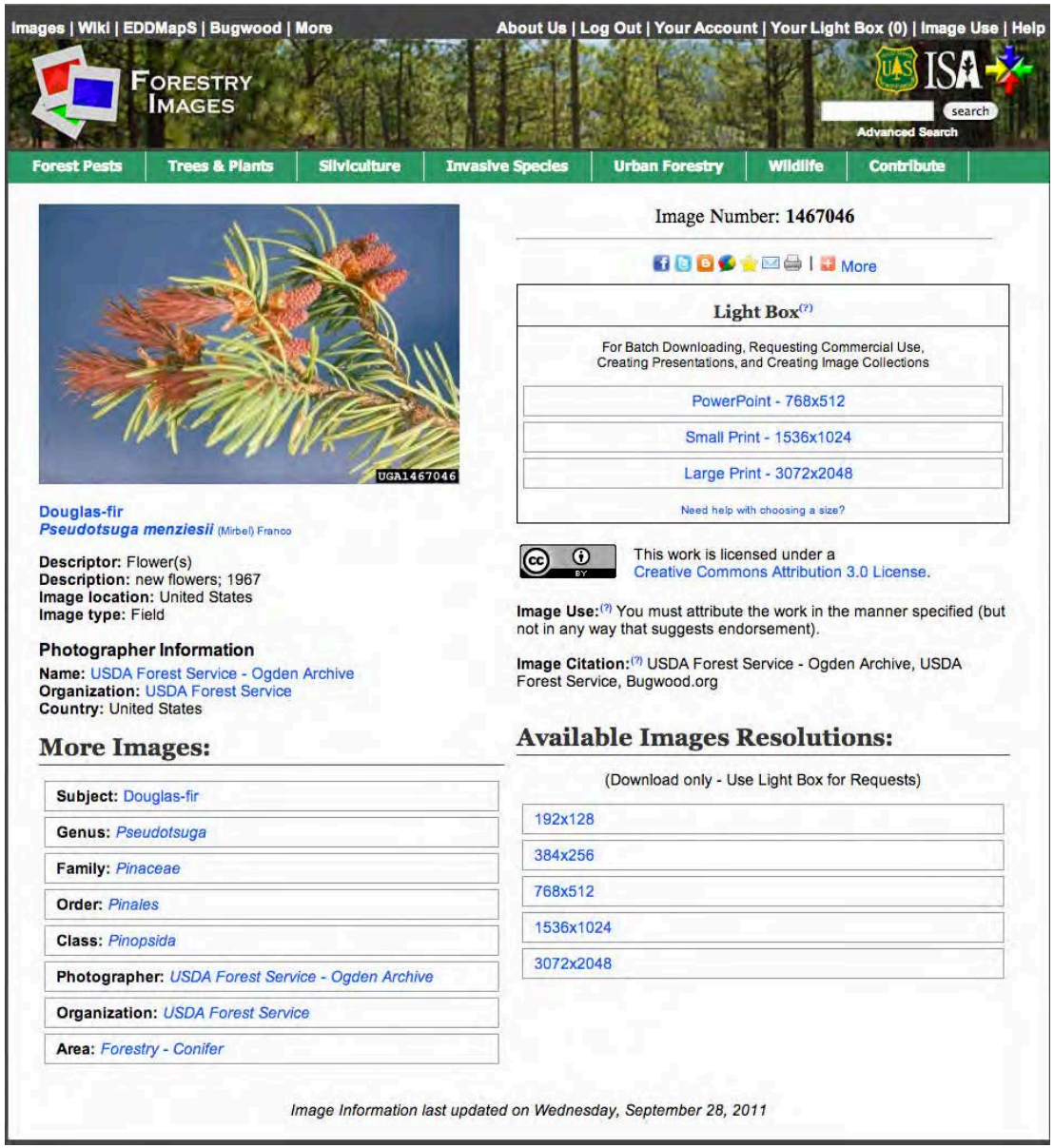
Resolution (dpi)

Scale



Downloadable high resolution images.





Downloadable high resolution images.

Bugwood.org

Figure 2. **Whitefringed beetle larva. Note the well-developed, slightly darker brown head capsule on the right; the chewing jaws; the multi-segmented, ivory-colored body; and the absence of legs. (Photo credit: Edward L. Barnard, Florida Department of Agriculture and Consumer Services, Bugwood.org)**

Figure 3. **Adult whitefringed beetle (actual length about 1/2 inch), so named because of the white markings on the edges of the gray-striped wing covers. Also note the elbowed antennae and the short, broad snout. (Photo credit: Pest and Diseases Image Library, Bugwood.org).**

Adults live above ground, hide in plant debris, and feed by cutting small notches in the leaf margins of various plants. The flightless adults are transported accidentally

Adults emerge from the soil April through October. Flood irrigation may force the beetles to leave alfalfa and take temporary refuge around homes, other buildings,

Bad sources of image files

- **Screen captures**

  Images on the Web
  are usually only 72 dpi.
  (Find out about copyright before using any online image, and be careful to not use images with watermarks.)

- **Cut or copied and pasted images**

  I do NOT recommend copying a pasting images from one software into another! The image quality will degrade every time this is done and the resolution is usually low.

What if the only photo you have is within a MS Word document?

I do NOT recommended copying/pasting images; however, if the clarity of the image looks good **(by that I mean NO pixels)** and the image is the only thing on the page, you can make a PDF of the page and insert the PDF into your document as a graphic. You can also print the image, scan it at 300 dpi and insert into your document as an image.

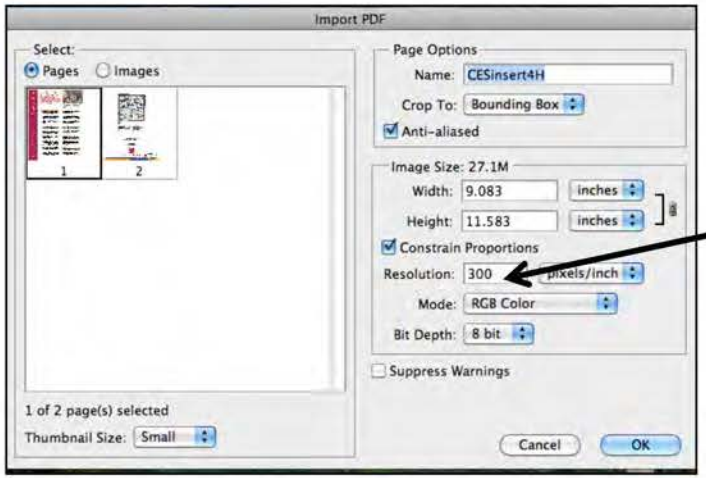
The quality won't be as good as an original, high resolution image, but it may be adequate.

What if the only photo you have is within a PDF document?

If you have Photoshop, you can open the PDF, crop out the image and save the file as TIFF image. If you don't have this software, you can print the page, scan it at 300 dpi and insert into your document as an image.

The quality won't be as good as an original, high resolution image, but it may be adequate.

How to convert a PDF into a graphic file using Photoshop.



1

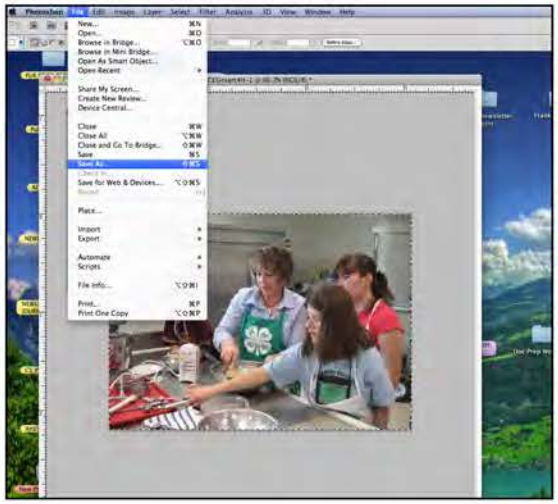
File > Open > filename.PDF. Make sure resolution is 300 dpi.

2

Select the photo with the Rectangular Marquee Tool.

3

Image > Crop



4

File > Save As > TIFF format

What image formats are best to use for print?

- **TIFF format** is preferred by the print industry for photos, etc.
  - If your project is going to be printed on a printing press all images need to converted to CMYK mode.

- **EPS, AI format** is preferred for illustrations.

What is CMYK and what is RGB?

The **CMYK color model** stands for **C**yan, **M**agenta, **Y**ellow and blac**K**. When a color photo is printed it is literally separated into these four colors and printed one color at a time. These four colors then combine to give you the full color image.

When a photograph is going to be reproduced on a traditional printing press or on today's digital presses or color printers, photos should be converted to CMYK format prior to reproduction to ensure color accuracy.

The **RGB color model** stands for **R**ed**, G**reen **and B**lue. Files in **RGB** format are intended for use on electronic systems like TVs, mobile phone displays and computer monitors.

You've probably noticed that the colors of photos on different electronic devices often look different—that is because each device reads the color breakdowns differently. You don't want this type of inconsistency in print.

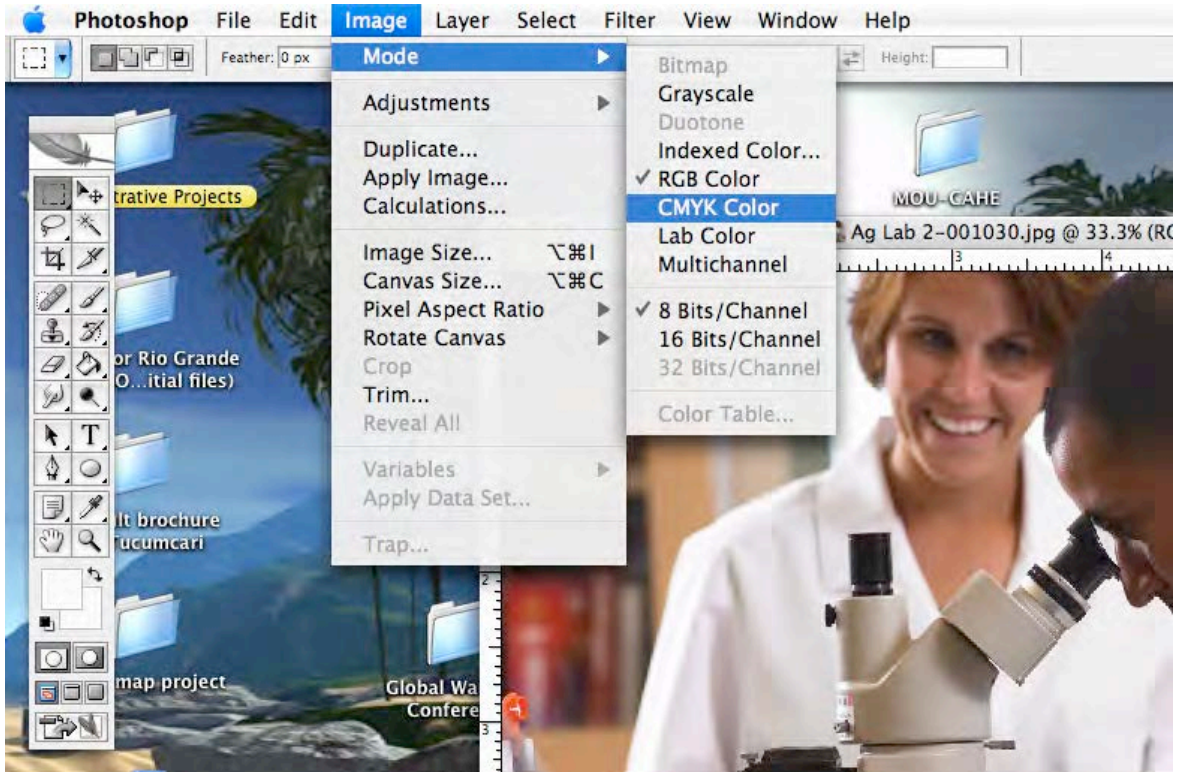
How do I change a file from RGB to CMYK to prepare file for printing?

The only way to change a file from RGB to CMYK format is to use Photoshop.

You would go to Image > Mode > CMYK Color.

Also, remember to to save the file in TIFF format.

If you don't have this software, pre-press staff at your print shop will need to make the change for you.



Linked vs. Embedded images

- Placing or inserting your images **LINKS** them to the document. Pasting them in **EMBEDS** them.

  – **Links** establish a connection from one file to another, without significantly increasing the document file size.

  – **Embedding** literally puts one file into another, often significantly increasing the document file size.

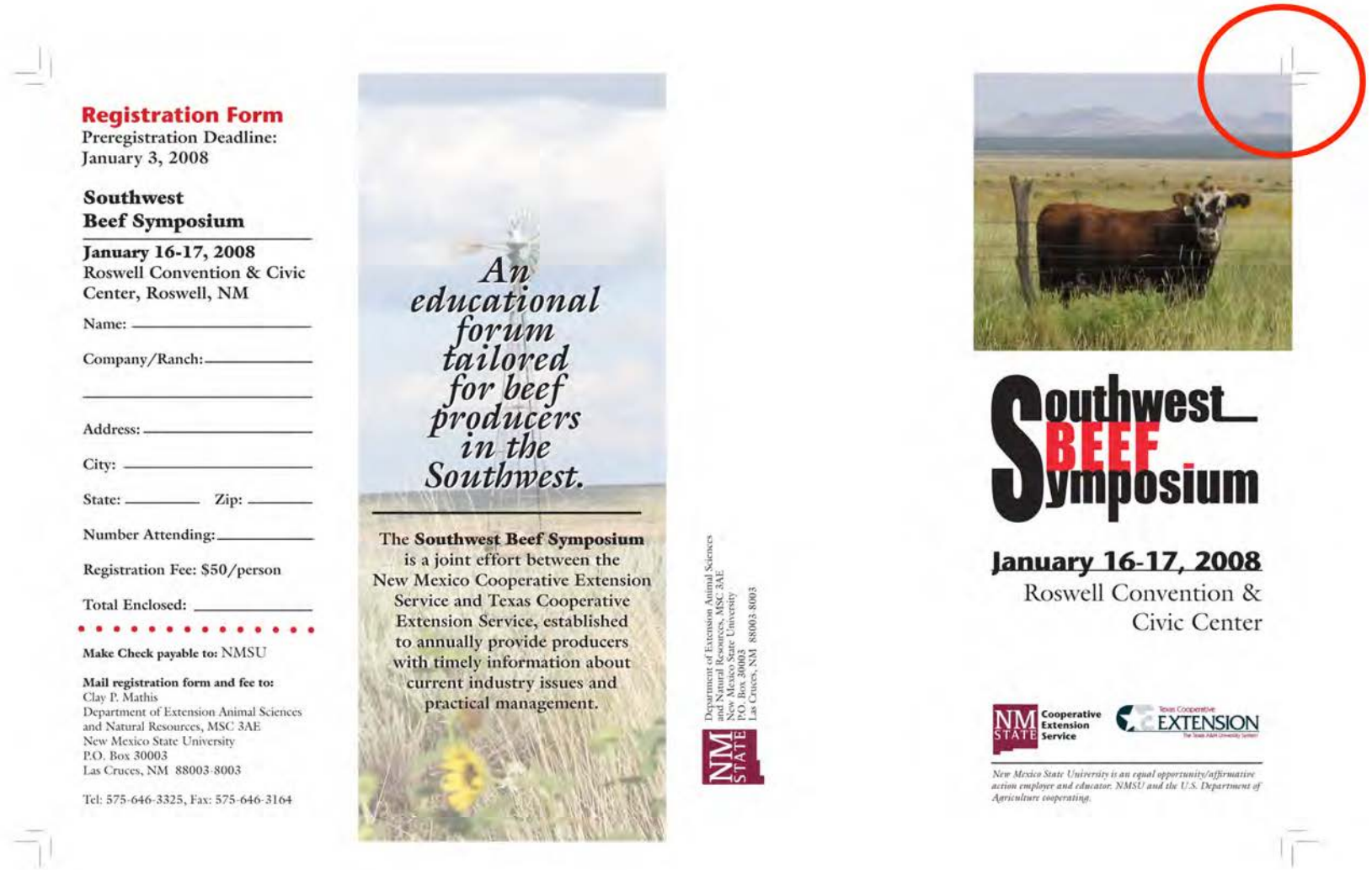
Why is embedding images a BAD idea?

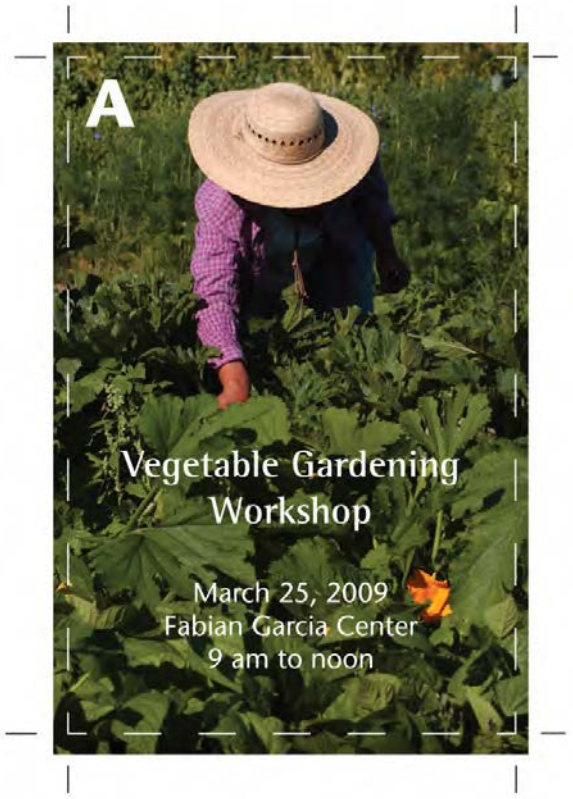
- Embedded images are usually low resolution.
- You **CAN'T** modify embedded images.
- When all images are embedded, it is sometimes difficult to print a document.
- Embedding images increases the size of the document more than when they are linked.

What are bleeds?

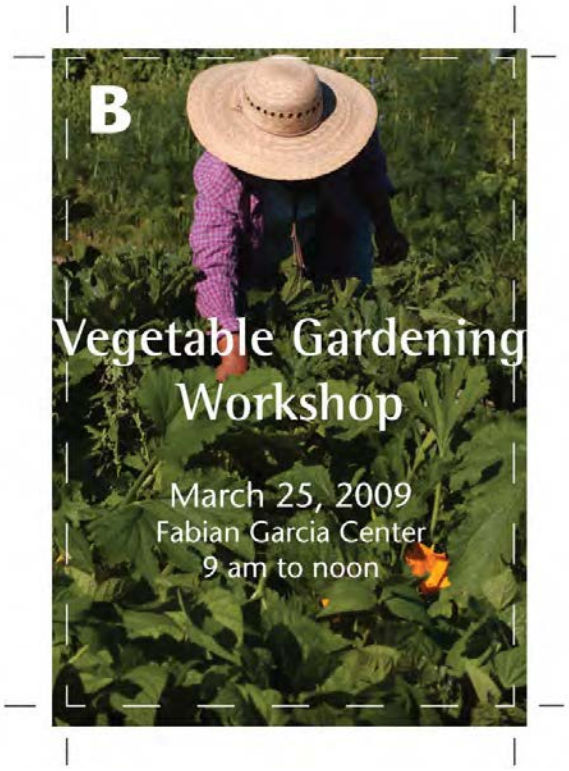
A bleed is when an image extends beyond the edge of the paper and excess is trimmed off.

Crop marks (highlighted) let the print shop staff know where the paper should be trimmed. These were generated by Adobe InDesign.





Good setup



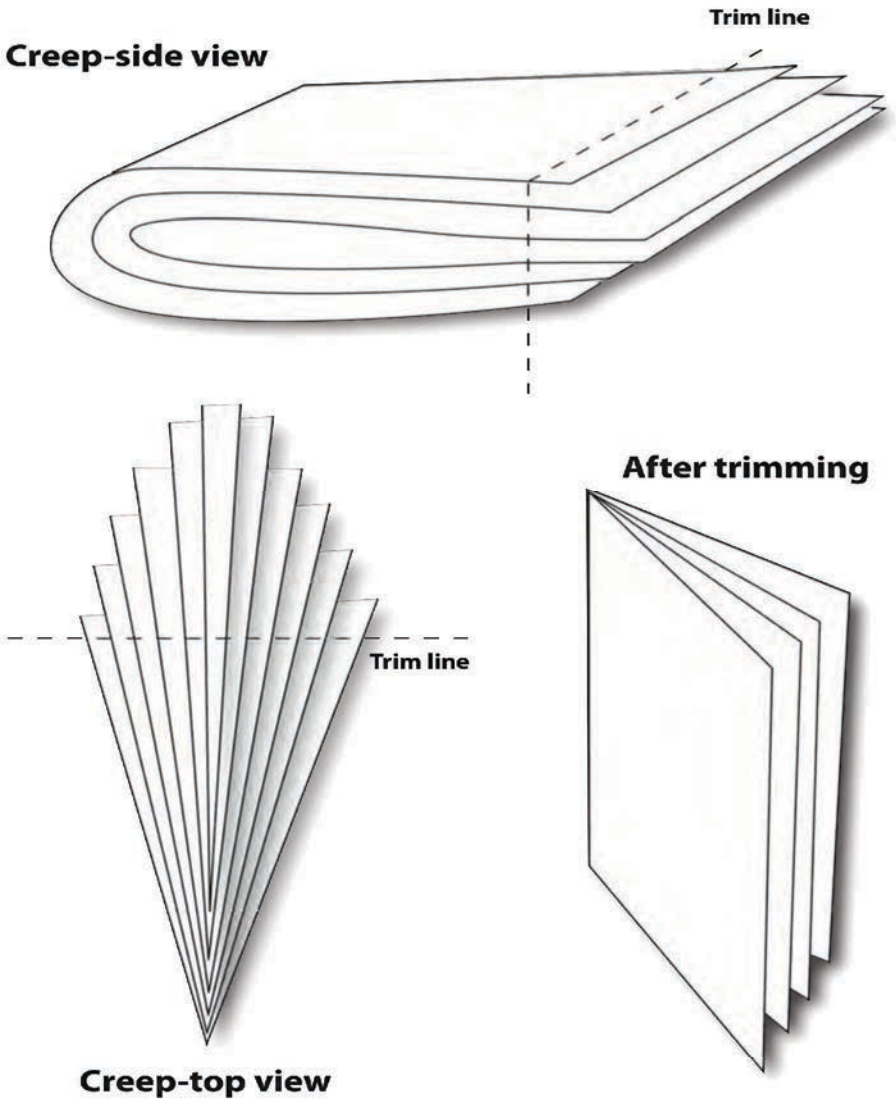
Bad setup

If you don’t have a design software, you can still set up a project to allow for bleeds. The easiest way to do that is to place your text and images on the page with wide enough margins (.25 to .5 inch) that will give the print shop staff enough space to trim excess content from the image to give you the bleed you want.

What is binding and when should you start thinking about it?

Binding is how the pages of your print project are assembled. **You should start thinking about it as soon as you start working on your project**—so you can adjust margins for the desired binding option. We'll be discussing the three most common types of binding: saddle stitch (staple) binding, spiral binding and perfect binding.

Saddle-stitch (staple) binding



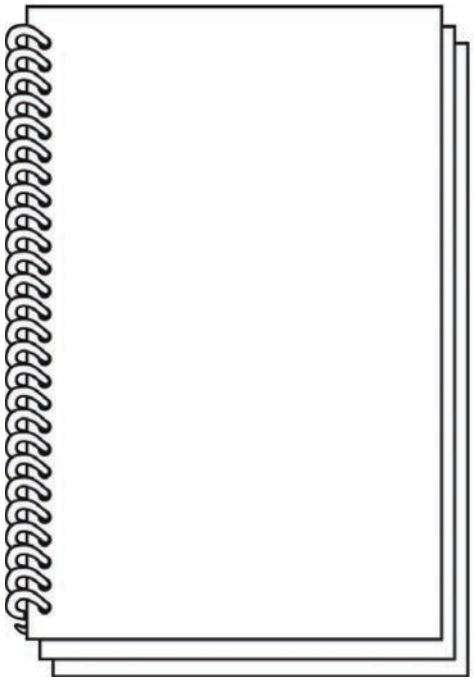
Tips

• **Margins should always be set to at least .75 in.** The bigger the document the wider the margins need to be (if saddle stitching is the preferred binding.) **Remember you only have so much space to work with!**

• You need to worry about creep (excess paper beyond trim line) if your document has over 60 pages (or 30 sheets, back/back)

• Consider other types of binding if your document is over 80 pages long (or ~40 sheets, back/back).

Spiral binding



Perfect binding

Remember

Creep is NOT an issue in either of these types of binding. **But it is a good idea to use wide margins on your documents—preferably .75 in. or higher.** The inside margin should be wider than the outside margins to allow for spiral binding and to allow easier reading on large documents.

How to organize your files.

- **Main software file (native file)**: Adobe InDesign, Publisher, MS Word, PowerPoint **(Note: we recommend using professional design software whenever possible!)**

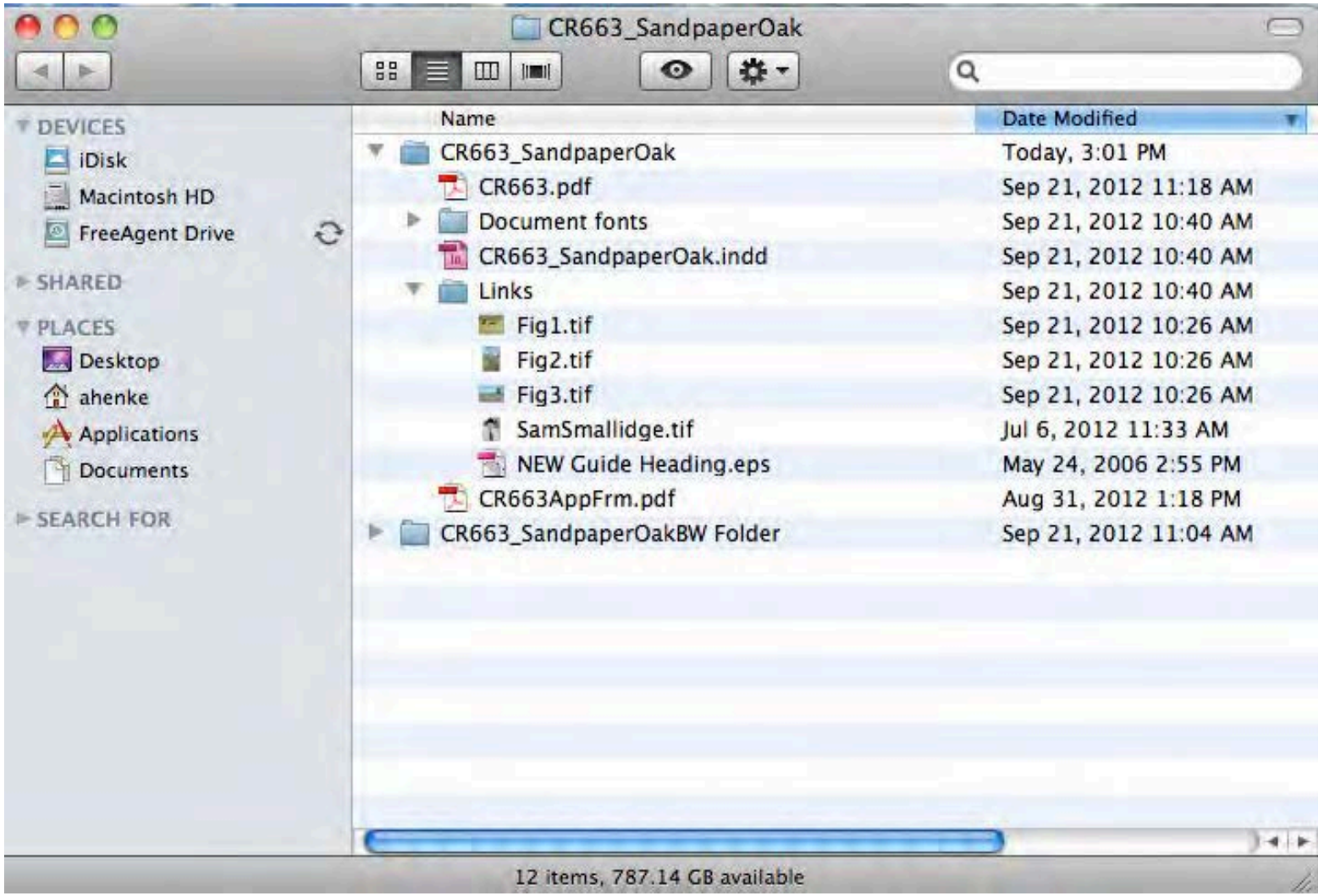
- **Image/graphics folder:** TIFF, JPEG, GIF, PNG, PICT, BMP, EPS

- **Fonts folder** (This can be generated automatically if you are using a professional design software.) If you don't know how to access your fonts, I recommend that you use standard fonts found in most computer systems in your designs. This will limit the amount of text shifting that may occur when the pre-press staff at your print shop works with your file. (EX: Times New Roman, Garamond, Helvetica, Arial, etc.)

- **PDF of document**

NOTE: Putting all of these files and sub-folders in ONE folder will make it easier for your software to locate the images when the file is opened. This will also make your job and the print shop's staff job easier when printing your project.

Example of how to organize your files.



Why are PDFs so important NOW?

- **PDF (Portable Document Format):** These files are basically a fixed electronic image of your publication.

- **PDFs are now preferred by most print shops to produce color copied projects AND press run projects because using this one single file—that contains everything—is much easier to process than needing to work with all of the individual elements that you used to build your publication.**

- **How to create a PDF:** The software you are using to build your print project (also known as native file) usually allows you to make a PDF easily by using the “Save As” option or from the “Print” option.

Graphic Design Basics

- **Legibility** (If you can't read it, what's the point?)

- **Alignment** (Headings, photos, column content, etc.)

- **Repetition** (Try to use ONLY two fonts, one for your headings and one for your body text, use the same color scheme throughout, same sized photos/charts & graphs).

- **Contrast** (Font headings should be larger than text font; contrast in text color and background enhances legibility!)

- **Use high-quality images, charts or graphs.**

Legibility and capitalization

HURRICANE KARL BATTERS MEXICO AS IT NEARS LANDFALL
POWERFUL HURRICANE KARL BATTERED THE CARIBBEAN COAST OF MEXICO ON FRIDAY, BRINGING TORRENTS OF RAIN AND FIERCE WINDS SEVERAL HOURS BEFORE ITS CENTER WAS EXPECTED TO MAKE LANDFALL.

Hurricane Karl batters Mexico as it nears landfall
Powerful Hurricane Karl battered the Caribbean coast of Mexico on Friday, bringing torrents of rain and fierce winds several hours before its center was expected to make landfall.

Which is easier to read?

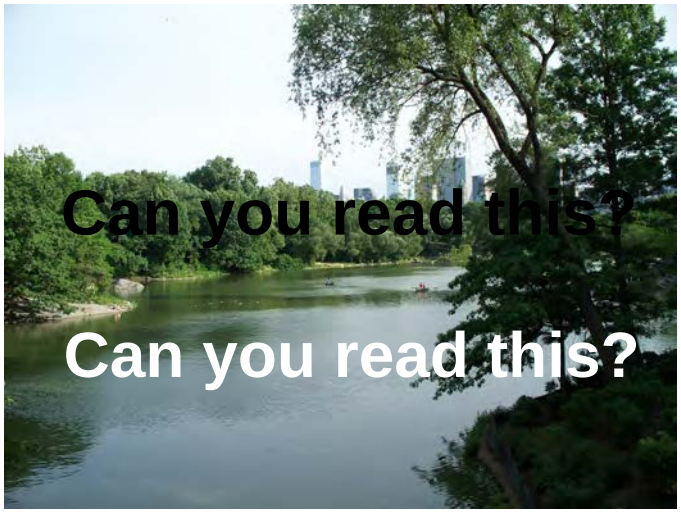
The lack of **contrast** between background photos and font colors affects **legibility.**

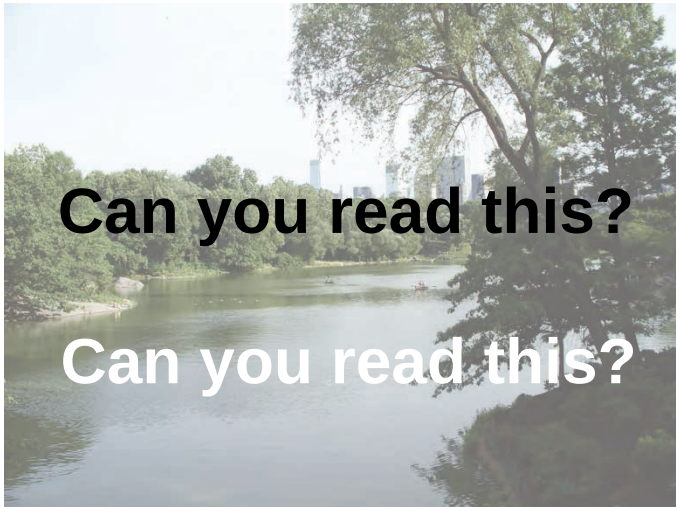
Full color

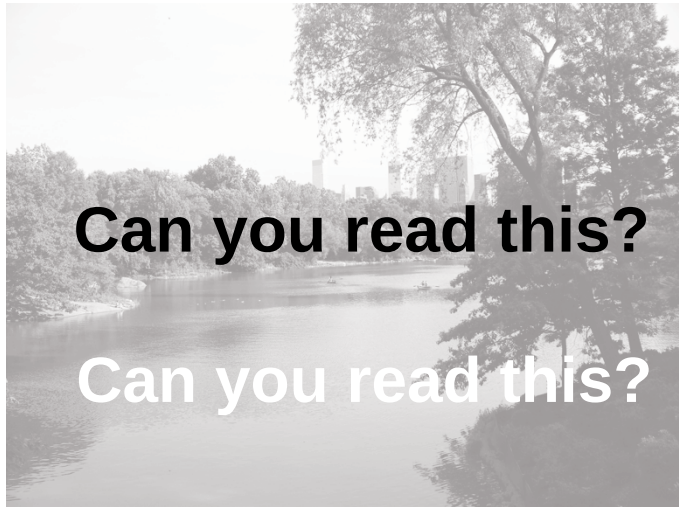
Watermark

Grayscale

The better the contrast, the more legible the text.







Alignment is demonstrated beautifully in this example by how the subheads are aligned to the left margin of the columns, while the text is indented. This sets the paragraphs off nicely and draws the eye down the page and onto the next column. Also, notice how the text from both columns align with each other.

Repetition is demonstrated by the repeated use of color in the sub-headings and consistency and limitation of font choices in the layout.

Contrast is demonstrated by the larger font size of the subheading and the black text on white and light yellow boxes, as well as the reversed out text on crimson.

Ask us | Work with us | Grow with us

New Mexico 4-H Youth Development

4-H provides youth with opportunities to learn skills, gain knowledge and make contributions to their communities.

About

The New Mexico 4-H Youth Development program is an informal education program dedicated to creating self-directing, productive, contributing members of society by providing youth with the opportunities to acquire leadership, citizenship and life skills. Members learn how to think, not what to think, and develop an appreciation for the importance of self, science, agriculture and the home.

The goal of the 4-H Youth Development program is to provide appropriate developmental opportunities for young people to learn and experience life skills, practice them and be able to use them when needed throughout a lifetime. The program achieves success by providing members with positive peer groups, year-round community clubs, special-interest groups, school enrichment programs, leadership experiences and other camps, events and activities.

Youth can grow through numerous leadership opportunities at the club, county and state levels, and may even go on to represent their state at the national level. Running for or serving as an officer or in committee positions not only helps youth develop leadership abilities, but also helps develop skills in public speaking, teamwork and decision making.

More than 200 projects are offered in a variety of areas, such as animal science, creative arts, engineering, nutrition, horticulture, agronomy and citizenship. Shorter-term projects are also available for special-interest groups and school enrichment programs.

Nationally, 4-H began around the start of the 20th century in the work of several people in different parts of the U.S. who were concerned about young people. The seed of the 4-H idea of practical and hands-on learning came from the desire to make public school education more connected to country life.

Head, heart, hands and health are the four Hs in 4-H. They are the four values that members work on through fun and engaging programs. Head –managing and thinking. Heart –relating and caring. Hands –giving and working. Health –being and living.

Get Involved

The success of the 4-H program is made possible by the dedication of some 2,800 adult volunteer leaders who share their time, skills and knowledge with 4-H members. The program reaches more than 75,000 children aged 5 to 19 with diverse ethnic and socioeconomic backgrounds from urban, suburban and rural areas across the 33 counties in New Mexico.

Contact

For more information or to join the 4-H Youth Development program, contact your county Extension office. Additional information is available by calling (575) 646-3026 or by visiting http://aces.nmsu.edu/4h/.

Maintain **alignment** by using grids. **Repeat** fonts and color scheme and create **contrast** by varying font sizes.

NMSU Gives Back

Aggie cancer survivor starts new scholarship for other cancer patients

Dealing with the challenges associated with the diagnosis of cancer is hard enough, but continuing the pursuit of a college degree can make it harder. To help survivors of cancer, or those with the diagnosis of the disease, NMSU has started a new scholarship for graduate students.

Aggies Cancer Survivor Endowed Scholarship was the brainchild of NMSU graduate student James Kilcrease, a cancer survivor who wants to help other NMSU students in similar situations.

"I had the idea to start up the Aggie Cancer Survivor Scholarship as a means of recognizing others that have battled this common enemy, overcome the odds, and continued on to pursue a higher education," said Kilcrease, a graduate research assistant in the Department of Plant and Environmental Sciences and president of the department's Graduate Student Organization. Kilcrease maintained his doctorial studies while receiving chemotherapy.

"The mental, physical and financial challenges of cancer are no small feats to be dealt with, and those who have ventured down this road should be rewarded for their efforts. I think this scholarship has the ability to give great opportunities to many future graduate students," Kilcrease said.

While the scholarship is for any NMSU graduate student who is a U.S. citizen with a minimum cumulative grade point average of 3.0, the College of Agricultural, Consumer and Environmental Sciences will administer the fund.

Recipients of the scholarship must be cancer survivors or currently diagnosed with cancer, but do not have to currently be receiving treatment to qualify. Applicants must submit a 600-word essay describing how cancer has affected their life and how they are involved in cancer awareness activities.

"Thanks to the generosity of Cowboys for Cancer Research and Tough Enough to Wear Pink, NMSU has strong support for cancer research, so the natural next step is to begin supporting cancer survivors themselves," said Mark Gladden, College of ACES director of development. "We are taking a truly all-hands-on-deck approach by asking the community to help us grow this important new endowed scholarship, and by making it open to students campus-wide."

James Kilcrease demonstrates how to operate a transmission electron microscope in one of the microscopy labs located inside Skeen Hall.

For more information about contributing to the scholarship, contact Gladden at markglad@nmsu.edu.

Jane Moorman

NMSU forester honored by renaming of Mora research facility

The contributions of the late John Harrington to NMSU and the state and regional forestry industry are being honored with a scholarship and the renaming of the Mora Forestry Research Center.

NMSU alumnus and faculty member Harrington died suddenly on June 6, 2011, when a car struck the bicycle he was riding home from work at the Mora research facility.

"When John died, his wife, Ann Wagner, said she'd like to start a scholarship in his name," said John Mexal, assistant head of the Department of Plant and Environmental Sciences. "We have had a great response from his fellow faculty members, co-workers, family and friends."

Harrington

The John Harrington Memorial Endowment Scholarship will be awarded to undergraduate and graduate NMSU students who are pursuing a degree in forestry, urban forestry or natural resource management through the Department of Plant and Environmental Sciences. The recipient also will demonstrate leadership in department or college activities.

"Preference will be given to a student who has collaborated with other students, faculty and staff as evidenced by a statement of career and college activities," Mexal said.

Harrington also will be honored with the renaming of the forestry research center in Mora where he served 20 years as the superintendent and research director. Dedication of the new facility name will take place on Aug. 16 during field day activities at the facility.

"The university's facility naming policy allows for individuals to be honored in extraordinary circumstances, such as John dedicating his whole career to the university and his sudden death," said Mexal. "This honor places John in a fairly elite crowd. Only two other agricultural science centers are named for individuals – Fabian Garcia and Philip Leyendecker."

Jane Moorman

NMSU celebrates sesquicentennial of Morrill Act

In 1862, the second year of the Civil War, the U.S. Congress accomplished important legislation that, while tangential to the war effort, made a monumental and lasting difference in agriculture and higher education throughout the country.

"An Act donating Public Lands to the several States and Territories which may provide Colleges for the Benefit of Agriculture and the Mechanic Arts" is the full name of the legislation variously known as the Morrill Act of 1862 and the Land Grant College Act.

President Abraham Lincoln signed it into law on July 2.

The act was the brainchild of Vermont congressman Justin S. Morrill, who for several years had been advocating for expanding the availability of higher education to the college-age children of America's working class.

Under this legislation, profits from the sale of these federal "land grants" would support at least one college in each state or territory still loyal to the Union.

The land-grant institutions were to emphasize the teaching of "such branches of learning as are related to agriculture and mechanic arts … in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

Although it wasn't until 1889 that the New Mexico College of Agriculture and Mechanic Arts – now New Mexico State University – was established by the territorial legislature, the mission of the institution dates back to that 1862 law.

NMSU is New Mexico's land-grant university.

As NMSU joins with the rest of the state in observing the centennial of New Mexico statehood, the university also acknowledges its own roots by celebrating the sesquicentennial of the Morrill Act.

Jay Rodman

USDA Undersecretary Avalos visits NMSU campus

"Sometimes you have to take the dirt road," Edward Avalos ('74, '96) told Cynda Clary's agricultural leadership class during a presentation last October. The expression is a mantra for Undersecretary Avalos, who has responsibility for three of the U.S. Department of Agriculture's 17 agencies and reports directly to Secretary of Agriculture Tom Vilsack.

Avalos grew up on a Mesilla Valley family farm, a "dirt road" experience he said not only taught him farming, but also the work ethic that has served him well in his career.

During his class presentation, Avalos told how choosing the more difficult option – the dirt road – at key moments in his life had gotten him where he is today. He even attributes being hired by the New Mexico Department of Agriculture in 1980 to such a choice, specifically to going "above and beyond" on a Texas Department of Agriculture publication assignment in the late '70s. He stayed with NMDA for 29 years.

Clary is interim head of NMSU's Department of Agricultural and Extension Education. She had invited Avalos to campus during homecoming week to receive AXED's outstanding departmental alumni award. His 1996 master's degree is from her department.

"Edward Avalos was selected for this recognition in appreciation of his contributions to the agricultural industry and especially for his commitment to helping young people find their careers," Clary said.

Edward Avalos, U.S. undersecretary of agriculture and an NMSU alumnus, received the outstanding departmental alumni award from the Department of Agricultural and Extension Education in October. He is pictured with Cynda Clary, interim department head, and members of her agricultural leadership class.

The importance of internships in federal agencies was another point Avalos stressed to Clary's students.

Avalos has worked hard to open up such opportunities at the USDA, especially for students from rural backgrounds in states like New Mexico that are far from the seat of government.

"It is an eye-opening experience for them to see how things work in our nation's capital," Avalos said in a recent interview. "Decisions are made there that not only impact their communities and state, but also the entire country and the world. Even a short internship in D.C. makes a big difference in their lives."

Jay Rodman