

Unique Glass Colors

Margot Clark and Dr. Saulius Jankauskas present



Intro to Fired Glass Color and Fusing Techniques

This lesson is designed to introduce you into the fascinating world of fired glass. We will be Marbling with Metallics, learning to “Control Your Bubbles,” applying solid color and capping it with a second piece of glass with a MUD Floral design, applying color that will create bubbles and cap it with a MUD Leaf Motif, sift dry color and cap it with a MUD Rosebud design and apply color that will create two different looks. All these pieces will be fired in a glass kiln and complete firing instructions will be included. All the pieces are two inch squares which make great sample pieces for larger projects, or to create a necklace, or mosaic them together to form a collage or.....whatever you can think of when you see your own finished pieces.

Unique Glass Colors Products:

NT Color Line

- 1956 Dark Blue
- 11020 Violet
- 1995 Apple Green

1997 Leaf Green
11012 Gold Dust
11013 Copper Glow
11016 Vanilla

Artisan Color Line

600 Azure
603 Royal Blue
604 Teal Green
605 Sienna
613 Plum

Original Color Line

950 Clear

Medium

White MUD Kit contains the following;

Stainless Steel Writing Tip
Pastry Bag Coupler
Disposable plastic applicator bag
Rubber bands
Storage Container with Sponge
Basic Instructions for MUD

Brushes

Margot's Miracle Brush for creating MUD flowers (included in MUD Kit)
Margot's 10/0 script liner for adding all color

Surfaces

10 - 2" square pieces of clear glass, cleaned well (no rubbing alcohol as it leaves an oily residue)
Assorted small pieces of compatible glass for accents

Misc. Supplies

A piece of **white paper** as it is easier to see what you are doing as you are applying color.
10 Empty 1 oz jars with lids for storing mixed colors
Water container
Paper towels
Small piece of screen or a sifting tool

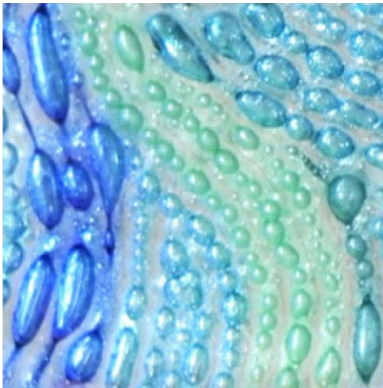
Mix all your colors *EXCEPT Leaf Green, Apple Green and Violet* (we will be using these colors in their dry powder form) with Medium using a 1:1 ratio. You are looking for the consistency of melted ice cream. Set aside.

Caution: Your imagination is going to be going at full speed as you work so be prepared for brain overload!



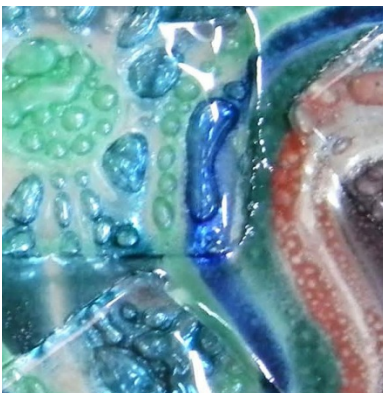
Marbling with Metallics – This project uses only one piece of glass. Colors used – Vanilla, Copper Glow and Gold Dust.

Place individual, random sized drops of Vanilla off the end of the 10/0 script liner brush and cover about half the surface of the glass. Now drop in Copper Glow and Gold Dust in the remaining areas. Wipe your brush, form a nice, sharp tip and drag the tip back and forth horizontally working from the top edge of the glass to the bottom. DO NOT play in it! Whatever pattern you create will fire that exact same way. Set aside to dry.



Control Your Bubbles – Two pieces of glass used on this tile because the product we are using UGC Artisan Colors and they need to be used in-between layers of glass for the bubbles to form. We are going to control where the bubbles go by creating lines of color that do not touch one another. Colors used are Royal Blue, Azure and Teal Green applied in solid lines.

You can see by the photo that the different colors create different sized bubbles when fired. To do this one simply start in the middle of one of the pieces of glass with Teal Green and create three lines that do not touch. Work off to the right with Azure following whatever lines you created with the Teal Green. Same on the left, then go to Royal Blue. Fill in any spaces left with Azure.



Control Your Bubbles and Create Texture – Same application directions as the last piece but adding in Sienna and Plum Artisan Colors. This time you choose where you want color and what design you want on the glass. The difference on this piece is that we are going to cap the glass with a few smaller pieces. The result will show that under the added pieces of glass you will have bubbles. On the areas that are not capped you will see that you will have a darker color and texture from the same product. That is because the Artisan Line was developed to create bubbles between layers of glass. Added bonus is the great texture you can achieve by using it on top of the glass. When bottom layer is dry, place the smaller pieces on top in a pattern that pleases you.



MUD Leaf and Artisan Color – Two pieces of glass. Artisan Royal Blue on the bottom and MUD leaf design on the top piece.

This time we want random bubbles instead of controlled bubbles. Wet the surface of the glass with water. Apply Royal Blue in a streaky manner to the whole surface of the glass so that some areas have heavier color and others have a much thinner application. This will create the look in the photo. This NEVER comes out the same way twice so just “go with the flow” and have fun applying the color!

Create a MUD leaf on the top piece of glass using the Three Dot Fillers shown in the next photo. Set both pieces aside to dry.

Three Dot Filler/Leaf/Snowflake/Daisy Petal design elements (how’s that for a descriptive name!) are used for a ton of different things so they are a really good thing to practice. We will use them in this lesson as fillers and to create the leaf. They are created by making three dots with the one in the middle being higher than the other two. Flatten the MMB against the “palette” (the lid of your storage container) in the medium/water mix until it is totally flat and you can

see “corners” on each side of the brush end. You will be using just the very corner of the brush, holding it vertical, to touch the top of the center dot and exert just a small amount of pressure as you pull down forming the tail. Repeat for the other two and pull their tails into the first one. If you are doing flowers you would be pulling towards the center, if doing leaves you would be pulling towards/into the main stem. Remember not to exert much pressure on the brush as you want that tail to be thin, thin, thin!

For the leaf, create the three dots at the outer tip of each leaf segment. Then go back and add two dots out to the side and pull in towards the stem. Repeat for each leaf segment until you have a pleasing leaf!



Learning to Apply Solid Color and a Five Petal Flower – Two pieces of glass. On the bottom piece we will be using Dark Blue and the script liner. Puddle, push, pull is the method we will use to apply the color evenly. This means to drop a small “puddle” of color off the end of the brush onto the surface (the brush is only a tool for this!) then use the tip to push and pull the puddle out a bit. Keep repeating until surface is covered. To see if you have even coverage hold the piece up and look at it from underneath. If you can see through the color, the application is too thin.

On the top piece create the Five Petal Flower and tuck in some Three Dot Fillers between the petals. Set aside to dry.

Basic Five Petal Flower. In all of the art world this is the most common flower you will see. Every artist I know has used these flowers somewhere along the line even if they were just used as filler flowers. In MUDDING they are great for all over designs and learning their construction is the basis for most all of the other flowers I create, even detailed roses!

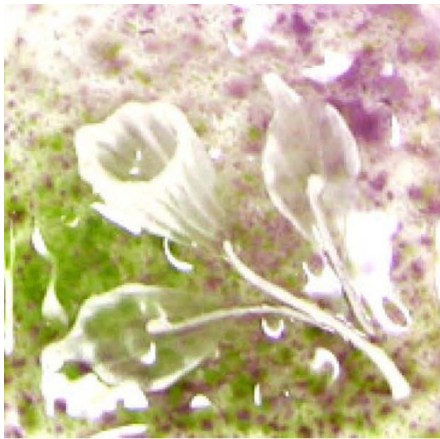


The photo shows the construction of the flower. Note that when you are forming the “Y” shape by turning the flower upside down, it is doing two things for you. It is creating two spaces for your last two petals so the flower shape comes out nicely instead of ending up with too much or too little space for the last petal and it is also not allowing you to create a “pinwheel” look to the flower as sometimes happens when you go around one petal after the other. You also want to be conscious of forming an arc to the top of each petal so they look natural and not like “teeth” unless of course you are creating Bachelor’s Button flowers and then that is fine. So you see – if you make a mistake just change your story!

Also, place a dot on your surface where the center will be – it is where the flower attaches to the stem, the calyx - you can see it in the second step. This is the direction you pull all the MUD to after you “dribble” it – that is the “catch and pull” part – you are *catching* the top edge of the MUD that was squeezed out of the applicator bag and *pulling* it towards the calyx where it attaches to the stem that goes down to the ground! The brush is dampened and flattened on your “palette” and you are just skimming the top of that edge – do not press down hard into the MUD – and then you are “pulling” with the brush still flattened so you keep your highlight and as the pressure lessens your shadow is created. This is also how the vein lines appear at the beginning of the petal and then fading away. Your flower size is determined

by how far out you start the first petal! Leave a bit of space between each petal for two reasons; 1) to make sure it doesn't end up looking like a blob of white on your surface and 2) in case you would like to add the three dot fillers between each petal as I show on the sample photo.

Note: Create one petal at time! If you make a bunch of "dribbles" around the flower intending to then go back and complete the petal you will find the MUD has begun to set up and you will not be able to "catch and pull."



Sifted Color and MUD Rosebud – Two pieces of glass. On the bottom piece apply a layer of Medium. Using the piece of screen, place a bit of dry powder Violet on the screen and then run your finger across the screen to sift the color onto the wet Medium (the Medium is used here to make the powdered colors stick to the surface of the glass). Heavier at the upper right, letting it fade off to the bottom left.

Dust off screen and repeat for Apple Green and then Leaf Green, allowing colors to come up a bit into the Violet.

Create the rosebud, (one petal of the Five Petal Flower with a second layer added to form the bowl), then the stem and then the leaves on the top piece of glass.

A Jen-Ken Bonnie Glo 15", 110V fiber kiln was used for all these tiles. However, at home both Margot and Dr. SJ use a combination of glass kilns and traditional ceramic kilns. The kiln just has to be able to go up to 1700°F. If firing in a ceramic kiln use the middle shelf as that is where the most accurate heat will be. Top shelf is hotter and the bottom shelf is cooler so you can use that to create different looks to your pieces. UGC products fire in the range of 1425°F to 1550°F on glass but can fire much hotter on other surfaces.

Because all of the glass used in class was double strength float glass and most of these tiles have two pieces of glass we used the following schedule in the Bonnie Glo kilns and have given complete firing directions. If you are using a different type of glass or thinner glass you will have to adjust your firing schedule. This just gives you a starting point.

This is the schedule of segments that we are using for this project:

SEGMENT 1: rA1 – 750 (degrees); F1 – 1525 (degrees); HOLD1 – 10(min.)

SEGMENT 2: rA2 – 9999 (as fast as possible); F2 – 1000; HOLD2 – 10.

SEGMENT 3: rA3 – 300; F3 – 850; HOLD3 – 20.

SEGMENT 4: rA4 – 9999; F3 – 80; HOLD4 – 0.

The length of time for the firing will be determined on how full of glass the kiln will be loaded. It takes the longest time to cool down and you want to be able to place your hands on the sides of the kiln and it be barely warm or cool is even better!

Any of these designs would make great full sized tiles for home installation. Custom glass tiles are very expensive to purchase and you now have the secret to producing your own custom tiles!

The Artisan pieces, because of their translucent nature would be wonderful anywhere light could be coming through them and are just as easy to create in larger sizes as panels.

The MUD designs can be used on both kiln fired and air dried pieces. Great technique for faux wood carving!

We hope you have enjoyed creating all these fused glass samples and hope you are inspired to add glass to your artistic endeavors.

Margot and Dr. SJ



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<http://uniqueglasscolors.com>

300 Ryder Lane Unit 1000, Casselberry Florida 32707 407.261.0900, Fax: 407.331.0900

Basic Information on UGC Kiln Fired Glass Colors

By Margot Clark and Saulius Jankauskas, MD, a.k.a. "Dr. SJ"

What are the differences between our NT Colors, Original Colors and Artisan Colors and ACCENTS?

Please visit our website and click on Shop then on UGC Color Lines. You will then be able to see each color and how it looks when fused between layers of glass. The particular characteristics of each color are also included in the description.

The **NT Color** line comes in a powder form that needs to be mixed with Medium on a 1:1 ratio, are not as transparent as the Original Colors, contain no lead and have colors that are not available in the Original Color line. Can also be used in powder form.

The **Artisan Colors** come in a powder form that needs to be mixed with Medium, contain no lead and will always form bubbles when fused between layers of glass and create a darker texture when fired on top of the glass. They can be applied lightly or more heavily depending on the desired effect. Can also be used in powder form. You can "control" the bubbles by leaving a space between lines of color and the bubbles will follow one another!

ACCENTS are a line of metallic colors that come pre-mixed in liquid form. Firing range 1425 – 1550F, same as for our color lines. Must be stirred thoroughly and shaken prior to use. Can be used with Artisan and NT Color lines. Can be fused between layers of glass or on top. When fired on top the excess burn-off will need to be removed with water and a soft brush. Accents differ from our NT Metallics by being brighter but the NT Metallics are very useful as they can be used in powder form

The **Original Color** line comes in a liquid state and feature some colors not available in the Non-Toxic line. They contain lead which enables them to flow more smoothly and to be more translucent or transparent. When fused between layers of glass, random bubbles will form between the layers

Which ones to use: Where and Why.

All of the color lines can be used on decorative items, glass panels, glass tiles, glass to be used in a stained glass project. *Test for compatibility on actual varieties of stained glass.*

NT's are great for use in all of the above, for use in schools and when creating items that will come in contact with food. Same for the Artisan Colors.

The Original Color line is great for all of the above but need to be used on the **back** or in-between layers of any item designated to be used with food because of the lead content. To make a "food-safe" item you would fire on a drape mold and then the actual colors would end up on the back side of the piece making the front "food-safe".

On what surfaces can both Original Colors and Non-Toxic/Lead Free colors be used?

All three color lines were developed to be used on glass from COE 85 to COE 96. They can also be used on commercial tiles, terra cotta, porcelain and "found" glass (bottles, table tops, old windows), etc. *Before starting any project a test application on your chosen glass is recommended.*

HOW TO APPLY COLORS

Keep all color stirred as you are using them as the pigments tend to settle to the bottom of the jar.

NT and Artisan Colors

Mix the powdered color with Unique Medium on a 1:1 ratio then add a drop or two of water if necessary so they are the consistency of “heavy cream” or “melted ice cream”. Colors can be mixed and stored in an airtight jar (we sell 1 ounce jars with lids on our website for your convenience). Some of the colors settle faster than others, *so all must be stirred well* before using again. There is a wide variation in how the different colors settle.

A note on the Artisan Colors. When using to create “lines” of color with a brush make the consistency a bit thicker so the lines of color stay in place easier and don’t spread out.

Fluid consistency for NT’s is very important. If the applied color does not level itself, the consistency is too thick – dilute using the Medium or a drop or two of water. If it is applied too thickly, it may curl back and pop off as it dries or pull back from the glass during firing. For Artisans you will notice that each color mixes up a bit differently. Thinner application will give a more translucent color and smaller bubble and a heavier application will have stronger color and larger bubbles – but- each color has its own size bubbles!

To apply colors for the most solid coverage - you need to “**Puddle, push & pull**”. Use a brush (10/0 liner for small areas, a small round for other areas. Pick up color and drop a small “**puddle**” of color to your surface then “**push**” and “**pull**” the puddle to apply. Add another puddle, push and pull until you have filled your area with color. **DO NOT BRUSH THE COLOR OUT OR “PAINT” IT ON UNLESS YOU WANT STREAKS IN YOUR COLOR! IT IS NOT PAINT!** A thin application will result in streaky color after firing. You **should not** be able to see through the wet color. Look at you work from underneath the glass as what you see there is how it will fire. If you make a mistake, let the color dry and scrape off with an Xacto knife or toothpick and brush off the chips and dust created with a soft brush and re-do the area.

To shade or highlight with colors, you need to “**pat, wiggle & muddle**”- apply colors side by side and blend by the using the tip of the brush to **pat** or **wiggle** between the colors to blend. To “**muddle**” push the color around with a larger brush in a more random, free-flowing manner.

To apply colors for a watercolor look – Leave water in your brush so the colors become thinned as you apply them to your surface. Tilt your glass so the colors run down your glass &/or run together. Note that colors will not be as strong as extra thinning has taken place. Be careful not to thin too much or you will have weak or no color. Test, Test, Test!!!!

When applying color and it is “beading up” on your glass - rub over the area with a toothpick and reapply the color. “Beading/Crawling” (color pulls in on itself or forms separate beads of color) as you apply the color. This may be caused by the surface not being properly cleaned, or oil left behind in a fingerprint.

Outlining a design - Use Outline Black or Outline White in the Decorator Bottle with the metal tip or with a small brush. Or – use MUD in the decorating bag. When filling the Decorator Bottle, be sure to first wipe off the rim of the jar to prevent little bits of dried color from around the lid getting into the applicator bottle and clogging the metal tip. Place a damp piece of paper towel over the tip and just set the plastic cap over that or place the cleaning wire down into the metal tip when you want to keep the Outline color ready to use (in case you forget something!) When you are done with the tip, unscrew it and place it in a container of water until you are ready to clean the tip. Keep an extra Decorator Bottle on hand, fill it with hot water, place the dirty tip on and squeeze clean water through the tip until clean. MUD can be kept in its storage box for months as long as the sponge remains damp

Clear Glaze (950T) This is from the Original Colors line so contains lead. Use when you want to slump, sag/drape a piece of glass with no color or use it in a design where some of the areas are clear. You can also coat real copper for inclusions in your fusing and it will keep the copper shiny.

Let color dry completely before firing.

PREPARING THE GLASS

There are many ways to clean your glass; here are the two we use most often.

A). Scrub both sides of the glass with a powdered abrasive cleanser and a green grit pad. Dry thoroughly. Make a brushstroke of just clear water on each side, the side that beads up most is the “tinned” side and should not be used for the colors. It won’t hurt the colors, you just have to rub over the area with a wooden toothpick and the colors lays right down – it is just a nuisance to have to do that!

B). Use very hot water and a hard bristled scrub brush.

C). Rub down with denatured alcohol (flammable) (We use this method only when teaching in a classroom situation and water is not available.)

Do not use rubbing alcohol or glass cleaners as they may contains oils &/or silicone and will cause the color to crawl and bead up.

Glasses normally used: single and double strength window (“Float” glass), framing glass and stained glass.

Framing glass is very thin and is good for very small items or where weight is a problem. It is usually hard, has a tendency to be brittle and harder to cut and normally two or more thicknesses are used when fusing.

Single strength window glass is light weight and is good for smaller items and dishes less than 10” in diameter. Two pieces are great for fusing. It is about 1/8” thick.

Double strength window glass is thicker, about 3/16”.

Stained glasses vary greatly and need to be test fired before using in a design as colors can change and to find out the bending properties of the glass.

FIRING GLASS COLORS

Use **Unique Glass Separator** on your kiln shelves and sagger/drape forms so the glass does not stick. Use **Unique FREE** to allow the glass to move “freely” on the firing surface. Place FREE in an old cotton sock and dust over the area where the glass will be, then apply every 2 or 3 firings after the first firing or each time to be sure.

ALWAYS FIRE WITH GLASS COLOR FACING UP! If you fire with the color down, whatever it touches will become permanently attached! Of course, there is an exception to every rule so you can fire with the color down as long as it is on fiber paper or fiber blanket or when it is in between layers of glass.

Our very best advice on firing is to contact your kiln manufacturer about firing your kiln and to always test fire before beginning a project to be sure you get the results you expected.

There are many good reference books on Glass and Firing. The two we use the most are:

“**Warm Glass**” P. Beveridge; I. Domenech; E. Pascual. Lark Books/Sterling Publishing Ca, New York, NY

“**Glass Notes**”. H. Halem. Franklin Mills Press. Kent Ohio.

The Basic Theory for firing glass: (these steps are modified depending on the size, thickness and effects you are trying to achieve in your piece)

1. Heating phase to warm & prevent thermal shock. (The thicker/bigger the piece – the slower.)
2. A rapid increase to your working temperature and then “soaking” or holding.
3. A rapid decrease in temp to around 1100-1000 F and “soaking” to allow equilibration.
4. Between 1100 and 850F cooling must be slowed and controlled. You can never go too slowly in this step! “Soak” or “Hold”, again to allow Temperature equilibration (the Annealing Phase)
5. Then a regular decrease in temp to room temp.

The following info on firing is based on what Margot does in her ceramic kiln and what Dr. J does in his glass kiln. You **MUST** do a test firing in your own kiln to see how your particular kiln fires and what gives you the best results. Remember, firing is based on time and temperature. **Test, test, test!!!! Note: We tend to use a lot of float glass so be aware you will have to find out the proper temperatures of whatever glass you are using!**

Firing in a ceramic kiln with cones - Peep holes are left in for the full firing. Fire 45 minutes on low, 30 minutes on medium keeping the lid vented about 1” during the first hour. Cool to room temperature, cold is even better! Generally, most ceramic kilns will be cooler at the bottom and hotter at the top, usually 017 at bottom, 016 in middle and 015 at the top for a 016 cone firing. By using witness cones you will find if you have hot and cold spots in the kiln and can then fire accordingly. Raise the bottom shelf 4”. Do not place anything at the very top as this is usually too hot.

Firing in automatic/progression ceramic kiln - Set the heat rise to 450 degrees and fire to 1517 degrees (016). For cone 017 it is 1445 degrees and for cone 015 it is 1550 degrees. Again, vent for the first ½ to full hour.

Firing in a programmable glass kiln – (For small pieces less than 10” again, using float glass) Vent for the first ½ to full hour. Heat rise of 450F/hour to approximately 1000F. Full speed to 1450-1525 and Hold or “Soak” for 10-20 min. A full speed decrease in temp to approx 1000F, hold for 10 min. A slow controlled decrease of 100F/hour to 850F and again hold for 10-30 min. A rapid decrease in temp, with the lid still down to room temp. You can NEVER go too slowly in your annealing phase!!!!!!

All kilns - Keep glass to center of kiln away from firing elements and be sure all elements are firing properly.

FIRING PROBLEMS

If the middle of the glass edge forms sharp, needle like points, it is over-fired. If the edges just feel rough or are still straight it is under-fired. Colors should be fine on both.

Firing UGC Reds – Vent your kiln, be sure you are not using a kiln that fires other things that may leave a residue behind to affect the reds, apply sufficient color and apply it evenly, be sure it is dry before firing. Lite Red causes fewer problems than Deep Red although both are considered “rouge” colors.

If the color is dull and tends to rub off after firing it is very under-fired.

If colors turn gray after firing, possible cause could be cleaning the glass with glass cleaner which can leave a residue or not enough ventilation in the kiln during firing.

Crawling during firing is caused by too heavy of an application of color or if color was not properly thinned. Remember, it must be the consistency of heavy cream or melted ice cream.

UGC Specialty Products

Unique Bubble Powder - Mix a small amount (no bigger than a small pea) with NT color and place dots of the mix where you would like raised bubbles. The size of the dots controls the size of the bubble. Must be used between two pieces of glass. Mix into NT's at 1/8-1/4teasp per 1/2 oz of dry color for nice random bubbling.

Unique Glass Sand – mix with any of the Fired Glass Colors to create texture. Aim for 1:1 mixture but be sure you have a bit more color than you do Glass Sand or it will pop off after firing. You can also add less Glass Sand for just a bit of texture

Unique MUD – Comes in White and Black and can be used as is (White only) or tinted with any of the NT colors (resulting color will only be a pastel). Fire between 1445 and 1550 along with UGC colors or can be fired cooler if desired. The hotter it is fired the shiner it becomes.

MISCELLANEOUS

*Colors may be brushed, sponged, air-brushed, stippled, stenciled and spattered.

*Apply over fired glaze and you have beautiful overglaze colors! Note: When planning to use over fired glaze a test fire is most important to see if the products are compatible when they fire. .

*To airbrush – On glass, spray an even coat and allow drying before applying another coat to prevent runs and sags. Two to four coats should be sufficient.

*If firing glass that has a predrilled hole in it, fill in the hole with Unique's Glass Separator before firing to keep the hole from filling in during firing as the glass moves. The fired Glass Separator just pops out after the firing.

***Remember – Test, test, test!!!!!!!!!!!!!!!!!!!!!! And....HAVE FUN!!!!!!!!!!!!!!!!!!!!!!!!!!!!**

Please be sure to visit our website www.uniqueglasscolors.com for more information, to sign up for our newsletter, for photos, projects, color charts etc.

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Margot Clark – CEO/Director of Marketing
Saulius Jankauskas (a.k.a. Dr. S J) – CFO/Director of Research and Development
Harold Clark – COO/Director of Production and Warehousing
Heather Nield – Office Administrator
Jennifer Clark - Webmaster