Garden Science

Garden FAQ

FOR THOSE OF YOU IN THE ACNH DISCORD, WE DO NOT PRICE OR SELL FLOWERS IN THIS CHANNEL. GO TO #GARDEN-TRADE-AND-SERVICES

Someone told me to read this FAQ??
It means your question has been *answered*. You can **CTRL+F** or use the **bookmark outline** (Button on top left) to find your question quicker.

If your question hasn't been answered, it means *we don't know yet or don't have enough conclusive evidence to confirm it. We are spending our free*
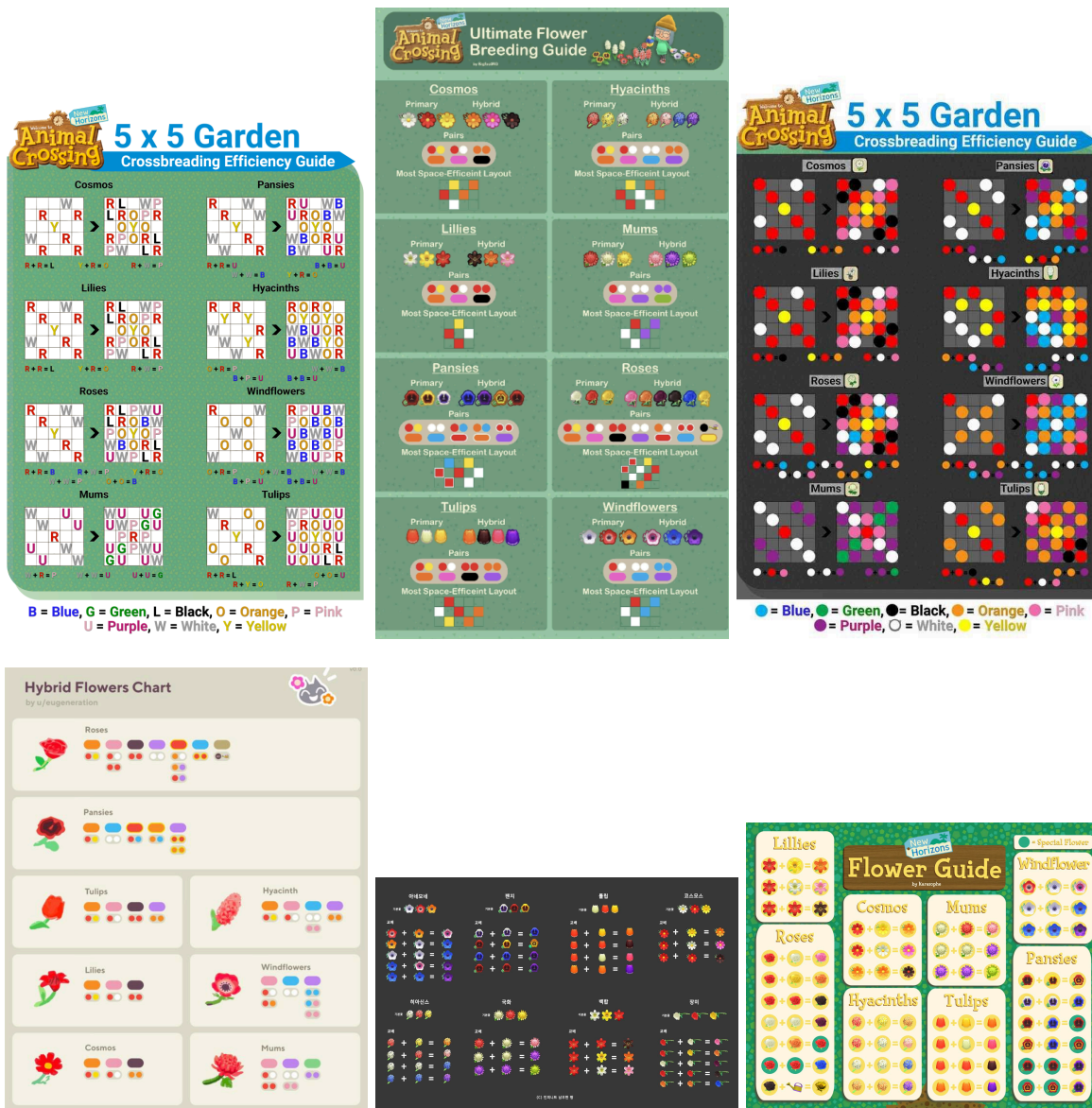
time researching virtual game flowers, do not get frustrated or impatient with us when we don't answer your question.

[Direct link to compiled list of garden documents](#)

OUTDATED GUIDES

Does this guide still work / accurate / right?

If you see the guide listed here, it's outdated / wrong.

Okay but what about these videos??

Many videos concerning AC:NH flower breeding are inaccurate. Read more breeding videos reviews in this [Breeding Video Review](#) doc.

Okay, so those don't work, which ones do?

All visuals made by @Peach-n-key have and @yuecrossing been looked over, confirmed and approved by gardeners in #garden-science-discussion! These visuals can be found in the #garden-science pins or in their imgur albums!

Peach's album

Yue's album

Many other approved visuals can be found in the pins and in #garden-science-info as well, give them a look!

All the guides are missing my combo! / Why did __ flower make __ flower??

There are over ten thousand breeding combinations (no, seriously). The guides show the quickest breeding combo to get a particular color. Listing them all (while keeping track of ancestry) would be tedious and redundant. (See Aeon's Simulator or Back's Hairball Guide.)

GENERAL INFO

What are all the colors / types of flowers?

Flower		Red	White	Yellow	Orange	Pink	Blue	Purple	Black	Green	Gold
	9 Total Colors										
Roses		Red	White	Yellow	Orange	Pink	Blue	Purple	Black		Gold
	7 Total Colors										
Tulips		Red	White	Yellow	Orange	Pink		Purple	Black		
	7 Total Colors										
Hyacinth		Red	White	Yellow	Orange	Pink	Blue	Purple			
	6 Total Colors										
Lilies		Red	White	Yellow	Orange	Pink			Black		
	6 Total Colors										
Cosmos		Red	White	Yellow	Orange	Pink			Black		
	6 Total Colors										
Mums		Red	White	Yellow		Pink		Purple		Green	
	6 Total Colors										
Windflowers		Red	White		Orange	Pink	Blue	Purple			
	6 Total Colors										
Pansies		Red	White	See Orange	Orange		Blue	Purple			

What does it mean to breed?

People often think breeding means to "produce new hybrid colors". Breeding actually means to "produce offspring using two parent flowers". Hybrids with different colors just take up only a portion of those offspring. Two flowers will breed if they are touching in any direction. For example, the red rose in the image will try to breed with any rose in the 8 neighbouring tiles. If you place a rose in one of the spots marked in the image by the white rose, the two roses can breed.

How often do I need to water my flowers?

Just once a day. You'll know a flower is watered by seeing sparkles on their petals.

When can I start watering my flowers?

You can start watering your flowers to produce new offspring once you see the color of their buds. Watering from the time you plant them also has benefits as it allows them to have a higher chance of reproduction sooner. (Photo examples below.)

When do flowers spawn?

All flower breeding and growths happen during the first loading screen of the day, no further changes will happen while you're playing or during subsequent loading screens.

Do flowers wilt?

They do not wilt in NH.

People are saying "start over from seed flowers". Why?

The reason you should start from seeds is that flowers have genes. You can have two flowers that look exactly the same but have very different genes, and you have no way of knowing their genes unless you started from seed flowers or mystery island flowers (which have fixed genes) and you kept track of the offsprings' genes by knowing which parents produced them.

I haven't been keeping track of my flowers at all! Should I start over?

Yes, for your sanity and ours. Start over and do your best to keep track.

Is it better to breed x with x to get more of x?

If you have two of the same colored flower and you want more of that color, it's better to clone them instead of breeding them together. Read more about this below.

What does it mean to clone a flower?

Unlike other Animal Crossing games, New Horizons introduced self-cloning. When a flower is not touching another flower of its same species in its surrounding tiles OR if its surrounding flowers are locked, there's a chance the flower will clone (see below for explanation of 'locking'). You can purposefully clone by isolating a flower and watering it daily for an average 14.8% chance.

What flowers can't clone? What flowers can you clone?

Lilies of the Valley and Gold Roses can't clone. The rest of the flowers can be cloned.

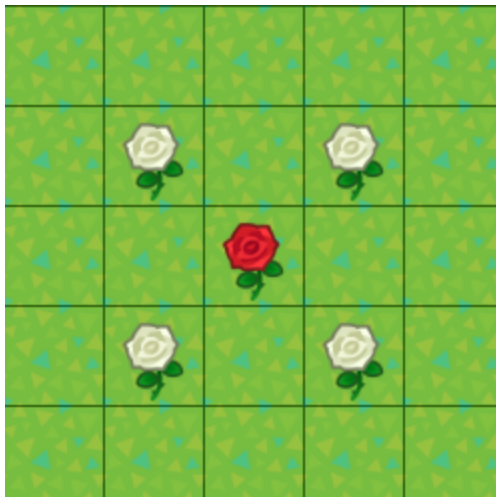### What's the difference between breeding and cloning?

Cloning only happens when a flower is selected to breed but can't find an available partner in range. It can happen with a bad layout (like the X layout or the checkerboard) or it can be an intentional method to get more of the same flower. In both cases, the new flower will have exactly the same genes of the parent.

Sometimes, a pair of flowers can produce a new flower that looks like one of the parents - <u>this is not cloning, this is still breeding</u>. The new flowers got half of the genes from one parent and half from the other, so even if the

color is the same the new flower could be very different. This is why some paths to rare flowers have "hybrid reds" or "hybrid yellows"

When a flower is locked, it means it has already bred with a flower therefore becomes unavailable to breed with any other flowers during the update cycle. This is only important / happens during the update cycle of the day, 5am or when you first open your game. You want to keep "locking" in mind when creating patterns (see "Why Xs are worse than Diamonds?") as it can create unwanted clones (See above questions.)

The significance of locking is that, during the day update process (when flowers grow and breed), if the game successfully pairs the middle red with 1 of the white roses for breeding, these 2 get locked, so all the remaining white roses will no longer have a valid partner to breed with. Not only that. once the red one gets locked, the whites will no longer have a valid partner to breed with, so they'll attempt to clone. depending on what you're breeding, you may not want your parent flowers to clone because it may get mixed up with the children flowers that you want if they're the same color.

What does it mean when a flower "rolls"?

Think of rolling a 6-sided dice. In order for a flower to produce an offspring, it needs to roll a 6. If it doesn't roll a 6, it doesn't produce an offspring! If it does roll a 6, next it looks for space! If it finds space, it looks for a partner. If there is a partner nearby (surrounding 8 blocks), it'll breed with that flower. If it finds space but can't find a partner, it may self clone.

Is there a cap to how many flowers can spawn each day?

No cap!

Can I start breeding with the flowers that are on my island?

You could, as any flower except gold roses and lilies of the valley can breed. However, be cautious when using them for breeding projects as they could have bred with the surrounding flowers after rain, preventing you from tracking genetics in a reliable way. (When in doubt, just scrap them all and start from seed.)

Can I start breeding with basic colour flowers I bring back from Nook islands?

Yes, their genes are also the same as those from seeds.

Someone plucked my flowers! / Someone trampled my flowers! When can they start breeding again?

Sorry to hear that! Flowers are ready to breed again when you can see their bud's color. The empty buds should show color the next day. Here are some examples of empty buds next to colored buds for better understanding:

How do I get Lily of the Valley?

You can get Lily of the Valley (LotV) by getting a 5-star island. Slowly more of these flowers will spawn around your island as you hold a 5-star rating. (Rate at which they spawn is still TBD.)

Does Lily of the Valley increase chances / do anything?

No, they don't do anything in NH and are just for aesthetics.

Gold Roses

Do gold roses clone?

No.

My black rose gave me a gold rose though I didn't water it with the golden can yesterday. Why?

If you watered your Black Roses with a GWC then this is totally normal! Black roses "remember" when they were watered by a golden watering can. They hold onto that "memory" forever until they produce a gold rose. If you bought them recently, the previous owner could have watered with a golden watering can before selling them to you! The Black Roses will still carry that "memory" even when moved to another island.

Can I still water my Black Roses with a golden watering can even if it's raining?

Yes! The Black Rose will still hold onto the "memory" of being watered with a golden can, rain will not override this or cancel it out.

Someone plucked / trampled my Gold Rose!! Will it grow back?

Yes, it will grow back as a gold rose in NH.

How do I make a Golden Rose?

You water a black rose with a golden watering can. The black rose, when selected to breed with other roses or clone itself, will have a 50% chance of producing a gold rose instead of a normal offspring/clone. For this reason, the best way to optimize your gold rose production is having the black roses in a cloning layout (see more on cloning in the section above)

How can I get a golden watering can?

You can get the golden watering can recipe by having a 5-star island!

SELF WATERING VS. FRIEND WATERING

Wow, there's a confirmed bonus if your friends water your flowers???

Yes.

What are the rates of x friends watering?

They add a bonus to your chances of your flowers producing an offspring. (When 5 friends water, you may get big sparkles on your flowers, this is normal.)

	Cloning Flowers (per flower odds)	Breeding Flower Pairs (per pair odds)

By yourself	14.8%	19.9%
1 Friend	28.9%	45.5%
2 Friends	37.3%	58.3%
3 Friends	50.9%	75.1%
4 Friends	65.3%	87.8%
5 Friends	80%	96%

Because breeding flower pairs odds are per pair, they would need to be 2x as high as per-flower odds to outperform cloning.

Calculations by Chomp. (Read more in Aeter's guide here) If you don't know what cloning is, see "What does it mean clone a flower?")

Cool! I'll put my flowers near the airport, let people water it, and then put them back in their original spot!
If you do this, you reset all the visitor watering flags, so you lose the bonus. It doesn't matter if they keep the big sparkles, it's a visual glitch: the moment you dig up the flower, everything gets reset (except the "normal water flag" and the "golden watering can flag" if it's a black rose)

How am I supposed to find more friends to water my flowers??
You can find more friends to help water in @MurdererFight's Watering Group doc. If you ever lose this doc, you can find it in #garden-science pins.

Do other residents on my island count as bonuses?
No, only other online / local players from other islands count towards the bonus.

Can my friends use a golden watering can to help increase my chances of a golden rose?

If you don't have a golden watering can, a friend can apply the "golden watering can flag" to your black roses, and since it's still water from a visitor it will also apply a bonus to the chance of producing a new flower. However, the chance to get a gold rose is still 50% so the chance to get gold does not increase.

Can I get an extra bonus if I / we water when it rains?

No. Rain, animal villagers watering, and other residents watering are all the same as owner watering. There is no bonus with them.

If I water when / after my friend waters, does it cancel out their bonus?

No. Friend water and Owner water are different states and do not overlap or override each other.

Do I still need to water my flowers before/after my friends water?

No, water is water. The visitor's water not only applies the bonus to the flower breeding chance, but also waters the flower.

How many times a day does my friend have to water? If they water multiple times does it increase the bonus?

Just once a day will work and no, them watering multiple times won't increase the bonus. They have to be separate visitors.

Hybrid Islands

As of game version 1.2.0, hybrid flower islands have been disabled, meaning they're inaccessible. The following information applies only if you are playing an older version of the game and haven't updated

What are the rates of getting the hybrid flower islands?
Note: as of game version 1.2.0, hybrid flower islands have been disabled. There are 2 different islands that have hybrid flowers that you can fly to using Nook Miles Tickets. One has a 2% chance of you getting there, and the other has a 3% of you getting there, for a combined rate of 5%. However, the game stops you from going to these islands more than once *per day*, meaning you can go to both in the same day. Other information about Nook Mile Tour islands can be found here.

I can't find x Hybrid Island?? What flowers can I find at Hybrid Islands?
Note: as of game version 1.2.0, hybrid flower islands have been disabled. You can only find your Native and Sister flowers at Hybrid Islands.

Flower Availability

What does Sister flower mean?
Your Sister flower is one of the two flowers you can find on Nook Mile tour islands. It is also one of the two species that are always available in your Nook's Cranny. Your Native flower is the species that was on your cliffs at the beginning.

How do I get flowers that aren't in my shop?

Your shop will always sell your native and sister flowers. It will also rotate between the flowers that are in season throughout the month.

What flowers are in season?

View this guide. (Read it in columns of month to understand) There are more than one flower in a season per month! It will rotate between the 3 or 4 flowers of that season.

Flower Availability - Northern Hemisphere												
Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rose					✓	✓	✓			✓	✓	✓
Tulip			✓	✓	✓	✓						
Pansy	✓	✓	✓	✓							✓	✓
Cosmos							✓	✓	✓	✓		
Lily						✓	✓	✓	✓			
Hyacinth		✓	✓	✓								
Windflower	✓	✓	✓	✓	✓							✓
Mum	✓							✓	✓	✓	✓	✓

Flower Availability - Southern Hemisphere												
Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rose	✓			✓	✓	✓					✓	✓
Tulip									✓	✓	✓	✓
Pansy					✓	✓	✓	✓	✓	✓		
Cosmos	✓	✓	✓	✓	✓	✓						
Lily	✓	✓	✓									✓
Hyacinth								✓	✓	✓		
Windflower						✓	✓	✓	✓	✓	✓	
Mum		✓	✓	✓	✓	✓	✓					

How are my island flowers determined?

Your Native flower was picked randomly from your birth month pool. Your Sister flower was picked randomly from your island creation month pool.

Trees

Why isn't my tree growing?

Tree science is a mystery, at the moment. Our current science is:

"A tree will not grow if there are 12 or more "blocking trees" within a 9x9 square centered on itself.
All trees in all stages that are equal to or are higher than a tree's own stage are considered to be "blocking trees";
(except for hardwood and cedar saplings which never block)"

Our advice is still "if your tree isn't growing, move it in a spot where it grows, and then put it back where you originally wanted it when fully grown. It will produce as normal."

Ok but why did the other trees grow normally?

We have no clue (but it's likely due to it being blocked, see the explanation above).

Bushes

What color / types of bushes are there?

There are Pink Azaleas, White Azaleas, Yellow Hibiscus, Red Hibiscus, Red Camellia, Pink Camellia, Yellow Tea-olive, Orange Tea-olive, Pink Hydrangea, Blue Hydrangea, and Holly.

How can I get the hedge diy?

Complete one (1) earth day task, you can find them in the Nook Mileage App, then talk to Nook.

Can bushes breed?
No.

Can bushes be placed / grown next to each other / cliffside / riverside?
Yes.

Do you know how many bushes can be placed next to each other?
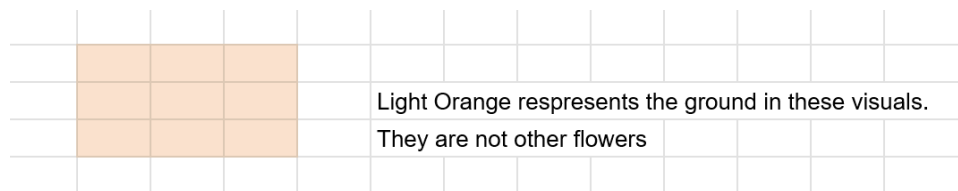We believe there is no cap.

My bush isn't blooming??
Bushes have blooming seasons.

Do you know the bush blooming seasons?
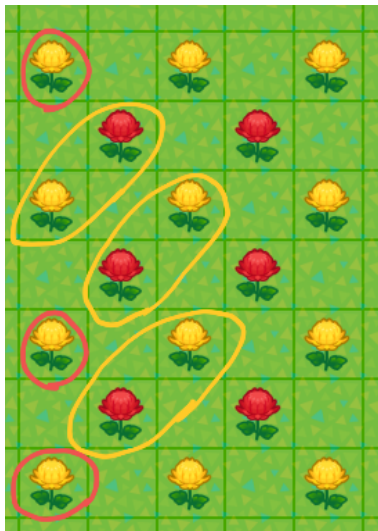Yes, see this image by Dazzabound

Layouts

Light Orange respresents the ground in these visuals.
They are not other flowers

What are paths / fences used for in layouts?
Fences used to help prevent / contain cloning. Dirt paths are to mark where offspring will be or where parents are to help confusion. Stone

paths are used to help prevent / contain cloning. A good tip: if you can't dig through the path, a flower won't spawn there.

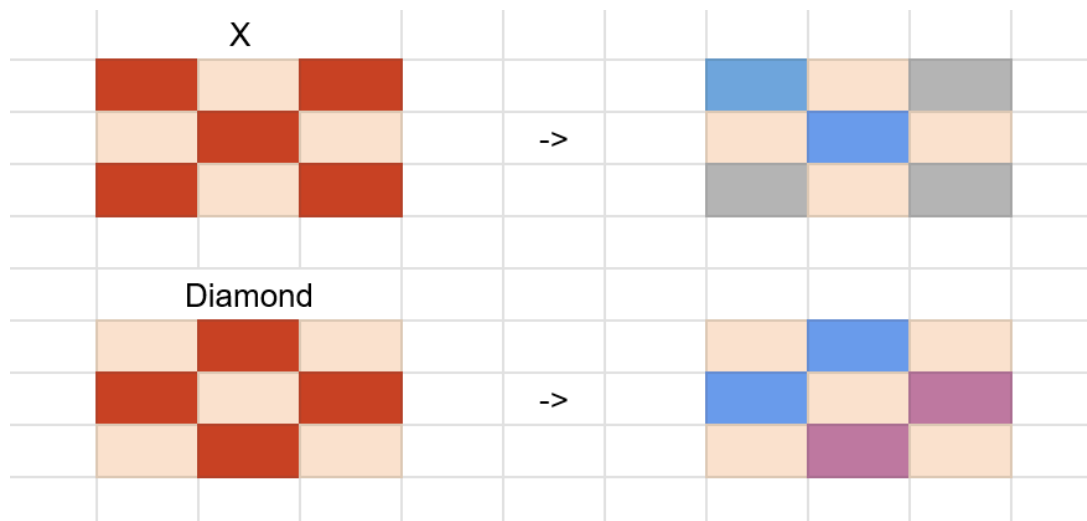### Can we still use the checkerboard layout?

Technically, yes, you can use it to produce hybrids. However, it's very inefficient, and if you're looking to use the offspring from the checkerboard to get more colors, you could have unintended results. If the offspring you're looking for is the same color of one of the parents, you wouldn't be able to tell whether or not it is a clone.

In this picture, you can see a possible outcome of the breeding algorithm: the pairings of the mums can leave the other yellow mums isolated and force them to clone. When you look at your mums the next day, you'll see new yellow flowers that can either be hybrid yellows or cloned yellows, meaning that if you tried to use them as a step to get green mums, it might not be possible to do so, slowing you down and wasting your time. Layouts like independent pairs or independent diamonds can give you the flower you're looking for with 100% certainty.

Why are Xs worse than Diamonds?

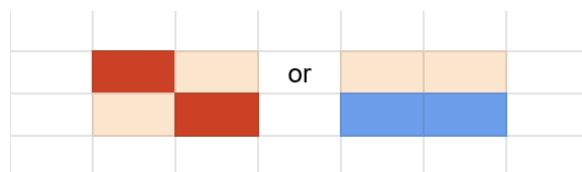When we refer to Xs and Diamonds, we're referring to layouts.

When using the X Layout, when a flower rolls and pairs, it'll lock the middle flower, represented by the blue blocks. (That's because it's the only one it's connected to.) This leaves the other 3 flowers, represented by the grey blocks, to clone because there are no more available partners. This layout is better when it's expanded around but then it becomes checkerboard. (See above question.)

When using the Diamond layout, when a flower rolls, it has two chances at pairing with a flower. This layout leaves no flower unable to pair and has less clones.

What is an independent pair?
An independent pair is a flower touching only one valid breeding partner.

Where can I find better or more efficient layouts?
Have a look at Yue's website here

Will you make an efficient layout for me?

No.

IntertwinedDiamonds are two Diamonds overlapped with each other. This is a form of a compact layout. The two diamonds *CANNOT BE THE SAME FLOWER SPECIES / TYPE*. They can be the same color but not the same species / type.

Flower TYPE 1
Flower TYPE 2
They are two **different** TYPES

<u>Genes?</u>

"Not all red tulips breed the same way, there are different kinds of red tulips that all <u>look </u>the same, but they breed in unique ways."

Genes?
Yes, ACNH and previous AC games have used genes.

What does that mean?
You'll often see gardeners say that phenotype doesn't mean genotype. But what does *that* mean? Phenotype means "face"-"type" or often called a "characteristic", is what shows on the outside. Think of your hair color / type, eye color, height, the sound of your voice for example, those are all phenotypes! Genotypes are the individual combinations that make up phenotypes / characteristics. In lame terms, this means that we found that the color of the flower is a result of its genes and not the other way around which we thought it was all along. It means that *genotype creates phenotype.*

Why is that important? Why does it matter to *me*?
This explains why not everyone is getting the same results from the same combinations. It's why someone might say, "I got y from x and x flower." then someone else also reply, "I got y from z and z flower!". We've found that breeding is not as easy as 1+1=2, and why some genes might "fall short" in creating other phenotypes.

What do you mean by "fall short"?
Say you want to achieve the number 2. You add 1+1 to create 2! That's great! But in the mechanics of the game, you don't have a *clear* grasp of the numbers as all you can see are *what colors the numbers make*. So now you add a red+red but it doesn't make 2. That's because behind the colors, the numbers "fall short", one red may be 1, but the other red could be .50, leaving you at 1.50 and not 2.

What do the numbers mean?
You'll often see avid gardeners refer to flowers as a series or numbers or capital or lowercase letters. We are referring to their genes as we've found that their genes are more important than their color. Here's a small guide deciphering our "code":

Trinary	Binary	Genetic Notation
0	00	rr
1	10	Rr
2	11	RR

I see some genes with a 4th value, what's that?
Those are roses. Roses are the only flower that has 4 genes / values. The rest of the flowers code will only have 3 genes / values or refer to the 4th value as 0 or 00 or simply not put the 4th value in at all (Because they don't have it!)

Wow this is really complicated, where can I learn more about this stuff?
You can learn more with these docs!

+ Many of us began here with Paleh's [Advanced Flower Genetics Guide](#) and grew from there. It has a great explanation and in-depth intro about genes and how each gene affects each flower individually!
+ Take a look at Aeter's [Complete Flower Guide](#)! It's incredibly reliable and has great explanations of all parts of the flower breeding process!
+ You can also view Aeter's [Flower Research](#) here as it contains more info that is a little too advanced for a simple FAQ.

Credits

The end isn't really the end, but a road map to the future.

People to thank…

Tristan, @Tristan0001

For leading us into this mess and saying that genes could be at the root of this. You were right.

[First Message Mentioning Genes](#)

Paleh, @Paleh2526

For giving us the first document about genes in Animal Crossing and all the data she's given us and for dragging us all down the rabbithole with her.

[ACNH/NL Advanced Flower Genetics](#)

Backs, @BackwardsN7201

For providing data and testing all layouts imaginable for efficiency and staying through all this madness.

[Optimized Layout Doc](#) | [Mad Rambles](#) | [Layout Simulations](#)

Aeter, @Aeter#9823

For providing the datamines confirming flowers had genes and creating a modern introduction for others to understand.

Flower Research | Complete Flower Guide | Flower Flags

Peach, @Peach-N-Key#1871

For creating all these eye-pleasing visuals that are being shared around the internet today as well as her simple layout guide.

Visual Guide Album | Layouts and Placement Guide

Aeon, @Aeon#5777

For creating a flower simulator that is helpful to many.

Flower Simulator

Murder, @MurdererFight#6308

For creating a way for the community to get together and solving everyone's issue of "not having enough friends".

Watering Group Doc

Ninji, @Ninji#1624

For giving us clarity with datamines when we were at a stop.

…

J, @J_MASTER#8835

For creating and researching more about layouts and how dense we can actually go.

ACNH Space Efficient Flower Production

Chomp, @Chomp#2418

For his mastermind calculations.

...

Nubleh, @Nubleh#3491

For creating a flower planner so we could understand each other better and creating a little fun in our channel.

[Flower Planner](#) | [Isabelle Announcement Maker](#) | [GS Memes](#)

Geny, @GεηY#5307

For creating the first calculator.

[Flower Crossbreeding Simulator](#)

Nia, @Chelidonia#1602

For optimizing the 21x39 into a grid

...

Rataime, @Rataime#2586

For beginning the search of and hypothesizing gold rose genes and creating the homozygous guide.

[Rose Gold Genes Message](#) | [Pointless Guide to Fully-Homozygous Flowers](#)

Aster, @Asteriation#6884

For a small guide of useful flower guarantees.

[Flower Guarantee Message](#)

Kaze, @Thomakaze#0420

For discovering strange red rose spawns.

[Message Mentioning a new Red Rose](#)

Keith, @KeithLapinig#1309

For discovering super sparkles and that you never have enough friends to water your flowers. (5V Cap)

[Message Mentioning Super Sparkles](#)

Bigfoot, @BigFoot MG#9157

For spreading the word with his in depth visual guide and explanation to Reddit.

[Reddit Post + Guide](#)

Yue, @Bean#1193

For her sleek and clean visual guides.

[Visual Guide Album](#)

To our testers,

Ellie33, @Ellie33#5074

[ACNH FLower Tracker](#)

Pilots, słolị̆d#6938

[Friend Water Sheet](#)

Lazy, @LazyLee#0069

[Gold Rose Gene Hypothesis Test](#)

Cato, @Catbat#4610

...

PCV, @PCVXD#1272

...

Everyone else in the gardening community in GS

[ACNH Discord Link](#)

Lastly, you, the reader

Thank you for getting this far. Reading all the way to the end and giving us

support throughout this all as we found everything out.

Happy watering!