Mickfield Hostas Newsletter

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Tetraploid cultivars

Most hostas are diploid, they have two sets of chromosomes, whereas tetraploids have four sets.
This month we investigate whether there is any advantage to a cultivar having more chromosomes, and why it seems to be a growing trend in hostas to chemically induce this characteristic.

Are tetraploid cultivars better than diploids?

Tetraploid varieties generally exhibit tougher leaves, have more robust/longer lasting flowers and seem to have better colour retention.
It is also claimed that tetraploid cultivars possess greater pest/disease resistance and that they perform better in harsher environments, such as full sun. We remain sceptical about such claims and still recommend gardeners to cultivate their hostas (especially those with a lot of white in the leaf) in shady, moist conditions. Cultivars can withstand more sun if their roots are kept moist, but we have found that their colours are less vibrant. Too much bright light can also shorten the period of time viridescent varieties exhibit their variegation. Plant ***h*. 'Whirlwind'**, or its offspring ***h*. 'Whirligig'**, in too much light and the fabulous colour contrast fades much more quickly than it would in deep shade.

Are tetraploid cultivars easier to grow?
To answer this question, it is very interesting to look at three very closely related plants in the list: ***h*. 'Fire and Ice'**, ***h*. 'Loyalist'** and ***h*. 'Paul Revere'**.
Out of the three, we have had the most success with *h*. 'Loyalist'.
H. 'Paul Revere' is extremely slow and *h*. 'Fire and Ice' can be very temperamental.
All three are reverse colouration sports of ***h*. 'Patriot'** (image below), but they cannot be considered to be more reliable than their parent, which is a tetraploid sport of ***h*. 'Francee'**. They all exhibit larger areas of white on the leaves than *h*. 'Francee', which might suggest they would be less robust and slower growing. However, *h*. 'Patriot', and ***h*. 'Minuteman'** (also a tetraploid sport of *h*. 'Francee') are wonderfully reliable growers and favoured by landscape designers for their impact in mass planting schemes.

Non-scientifically speaking...

We are collectors and growers of hostas and, as such, not genetic specialists. However, it is a fascinating subject and the basic concepts about how genes can be manipulated to produce different characteristics are readily accessible from a variety of sources.

As ever, we have avoided as much technical jargon as possible to answer the following questions:

Can tetraploid cultivars be engineered?
Yes, and they are now being created at quite a rate.
The introduction of Surflan (a herbicide) or colchicine (an alkaloid, used to treat gout!) can double up the chromosome number. However, some parts of the plant may remain diploid, so the effect is not always complete.

Because it is relatively simple to augment plants with additional sets of chromosomes, it is a burgeoning business. Claims of enhanced characteristics and improved garden-worthiness are fuelling the trend.

List of tetraploid cultivars

The following list is not exhaustive, as ongoing testing of cultivars is producing new additions all the time.
We hold all these varieties in our collection, except for *h*. 'Flame Stitch', which we cannot seem to keep alive. Click on the names for more information:

***h*. 'Amber Tiara'**	***h*. 'Hi Ho Silver'**	***h*. 'Radiant Edger'**
***h*. 'American Sweetheart'**	***h*. 'Hirao Supreme'**	***h*. 'Revolution'**
***h*. 'Anne'**	***h*. 'Hollywood Lights'**	***h*. 'Royal Super'**
***h*. 'Atlantis'**	***h*. 'Holy Mole'**	***h. rupifraga* 'Tetra'**
***h*. 'Avocado'**	***h*. 'Independence'**	***h*. 'Saint Paul'**
***h*. 'Captain Kirk'**	***h*. 'Ivory Coast'**	***h*. 'Schwarzer Ritter'**
***h*. 'Cathedral Windows'**	***h*. 'Karin'**	***h*. 'Second Wind'**
***h*. 'Christmas Candy'**	***h*. 'Lakeside Black Satin'**	***h*. 'Secret Ambition'**
***h*. 'Christmas Cookies'**	***h*. 'Lakeside Sir Logan'**	***h*. 'Silver Lode'**
***h*. 'Christmas Lights'**	***h*. 'Let Me Entertain You'**	***h*. 'Snowy Lake'**
***h*. 'Clifford's Stingray'**	***h*. 'Liberty'**	***h*. 'Spinach Souffle'**
***h*. 'Dance with Me'**	***h*. 'Light Hearted'**	***h*. 'Striptease'**
***h*. 'Dust Devil'**	***h*. 'Loyalist'**	***h*. 'Summer Breeze'**
***h*. 'Enterprise'**	***h*. 'Magic Fire'**	***h*. 'Summer Music'**
***h*. 'Essence of Summer'**	***h*. 'Majesty'**	***h*. 'Sweet Innocence'**
***h*. 'Eternal Flame'**	***h*. 'Middle Ridge'**	***h*. 'Taffeta'**
***h*. 'Fantasy Island'**	***h*. 'Minuteman'**	***h*. 'The Shining'**
***h*. 'Fire and Ice'**	***h*. 'Morning Light'**	***h*. 'Touch of Class'**
***h*. 'Fireworks'**	***h*. 'Night before Christmas'**	***h*. 'Touch of Frost'**
***h*. 'First Mate'**	***h*. 'Olympic Glacier'**	***h*. 'Twilight'**
***h*. 'Five O'Clock Somewhere'**	***h*. 'Paradise Breeze'**	***h*. 'Velvet Moon'**
h. 'Flame Stitch'	***h*. 'Paradise Glory'**	***h. ventricosa***
***h*. 'Grand Marquee'**	***h*. 'Paradise Gold Line'**	***h. ventricosa* 'Aureomaculata'**
***h*. 'Grand Prize'**	***h*. 'Paradise on Fire'**	***h. ventricosa* 'Aureomarginata'**
***h*. 'Grand Tiara'**	***h*. 'Pathfinder'**	***h*. 'Vulcan'**
***h*. 'Green Sleeve'**	***h*. 'Patriot'**	***h*. 'Whirligig'**
***h*. 'Heat Wave'**	***h*. 'Patriot's Fire'**	***h*. 'Whirling Dervish'**
***h*. 'Heavenly Tiara'**	***h*. 'Paul Revere'**	***h*. 'Whirlwind'**
		***h*. 'Whirlwind Tour'**
		***h*. 'Xanadu'**

Next month: We reflect on our 2010 show season...

Do tetraploid cultivars produce more tetraploids?

Apparently, as the pollen of tetraploids is larger (to hold the extra chromosomes) this makes these varieties difficult to breed with. The crossing of tetraploid plants with diploids tends to produce sterile triploids. Perhaps this is why the tetraploid cultivars listed are all sports, or originate from unknown parentage, which would suggest a sport.
The exception to this is the species ***h. ventricosa***, which is the only hosta able to reproduce reliably from seed.
It appears easier to create a tetraploid by chemical means than to do so through traditional breeding techniques.

Find out more

The processes of genetic modification have often been accused of creating bigger problems than they set out to solve. But we cannot deny the knowledge that has been unlocked in the process. There are lots of excellent resources for those of us wishing to know more about the subject. The **Hosta Library** has a growing series of lessons under the title 'genetics' on its website, which we found to be an accessible introduction for the layman. There is a lot out there - so why not explore further...

The advice and opinions contained within this monthly newsletter have been formed over more than 30 years of experience with the Hosta genus. We are constantly learning and refining that knowledge and would welcome any suggestions that readers of this newsletter would like to make so please contact us.