4N

The ever increasing number of new young plants labelled **4n** attracted my attention and if you believe nurseryman, "breeding" **4n** orchids is as easy as making a two-egg omelette.

Every now and then "entrepreneurs" come up with new ideas to improve the saleability of products and Orchid nurseries are no different. Half century ago, after a cloning mishap, the word "**Peloric**", an ill-conceived name that means "Huge", "Gigantic", was introduced in order to sell Phalaenopsis with odd looking mutated flowers. Today the word "Peloric" is used by nurseryman to sell orchids with mutated flowers of any Genus.

Today, the new selling point is **4n**. What does **4n** mean? How can anyone be sure that plants labelled and sold as **4n** are in fact **4n**? The answer is very simple. The chances are, **99.9%** they are not.

Life in the world of living is based on sex or if you prefer crosspollination. A cell that contains half the number of total possible chromosomes, like **gametes** (macrogamete (egg)/ microgamete (sperm)) is called **haploid (n)**. Haploid cells, unable to divide themselves, come together by fertilisation and create **diploid (2n)** cells. Human haploid cells contain 23 chromosomes. If we triple that, the new cell will have a total of **3n, 69 chromosomes;** however, it is still a **haploid (n)** cell.

A **Diploid (2n)** cell, contain the full number of total possible chromosomes and has 2 unique copies of each and every chromosome. Doubling a **diploid (2n)** cell, give us (**4n, 96 chromosomes**); however, it is still a **diploid (2n)**.

Tetraploid (4n) is an individual, organism, strain or cell that has four complete sets of chromosomes. In plain English, **4n** has four times the haploid number of chromosomes in the cell nucleus or quadruple the haploid number characteristic of the species. **Tetraploid (4n)** occurred by accident during the early evolution of plants many million years ago as a genetic mutation. Mutated genes were passed on and are more common today.

Different species have different numbers of chromosomes. When there are more chromosomes present than normal, the condition is known as **polyploidy**.

Assuming you understood the above complex issues, imagine a nurseryman you know well, dressed in white sterile overalls (uniform), with mask and all, entering a sterile million dollars purpose build facility, equipped to manipulate the genetic code (DNA). Changes can only be done before or at a very early embryonic stage and only experienced geneticists can perform such a task.

But wait, there is more. Tests must be carried out all the way from start to finish to prove or disprove the success of failure of the experiments. Modified orchid embryos, must grow and flower before anyone can tell if the desirable results were achieved. Mutations are often sterile, die early or may never flower. The only certainty in life is "nothing is certain". With orchids, there is another complication. The time required from an embryo to become a seedling and the seedling to flower can take from 3 to 15 years and some seedlings never flower. In the field of genetics, there are millions of failed attempts every year. The desire/dream/plan to "create" something special may never be fulfilled/materialize. Imagine the costs involve.

Manufacturers of genetically modified crops, make money from the sale of seeds. The seeds required to produce a crop must be purchased. Seeds from the harvested crop, to my

knowledge, cannot be used any further. Every year, farmers must buy new seeds, that's how companies make money.

Orchids are different. We can propagate orchids by division. Without a steady income from royalties, any investment in research cannot be justified. Cross-pollinating by hand to "create" **4n** plants, is haphazard and illogical. Starting plants must be tested beforehand and subsequently, all newly "created" hybrids must also be tested. Testing never ends. If the plants are never tested, how does anyone know they are **4n**?

Misinformed orchid growers believe: "If the flowers are large, it must be **4n**".

Advice: Buy the orchids you like and can grow. If you like surprises buy seedlings because with seedlings, you never know what you have until it flowers.