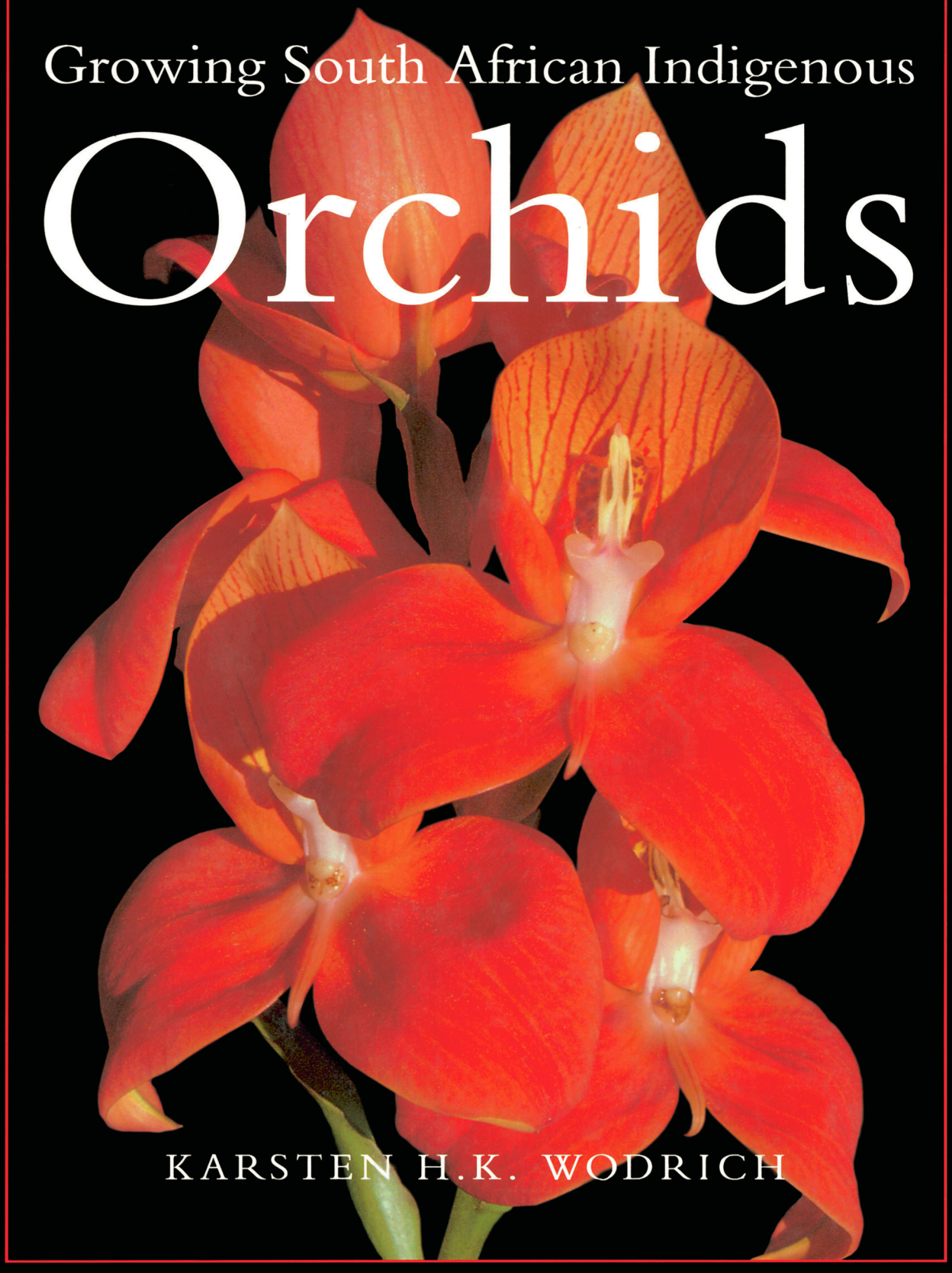
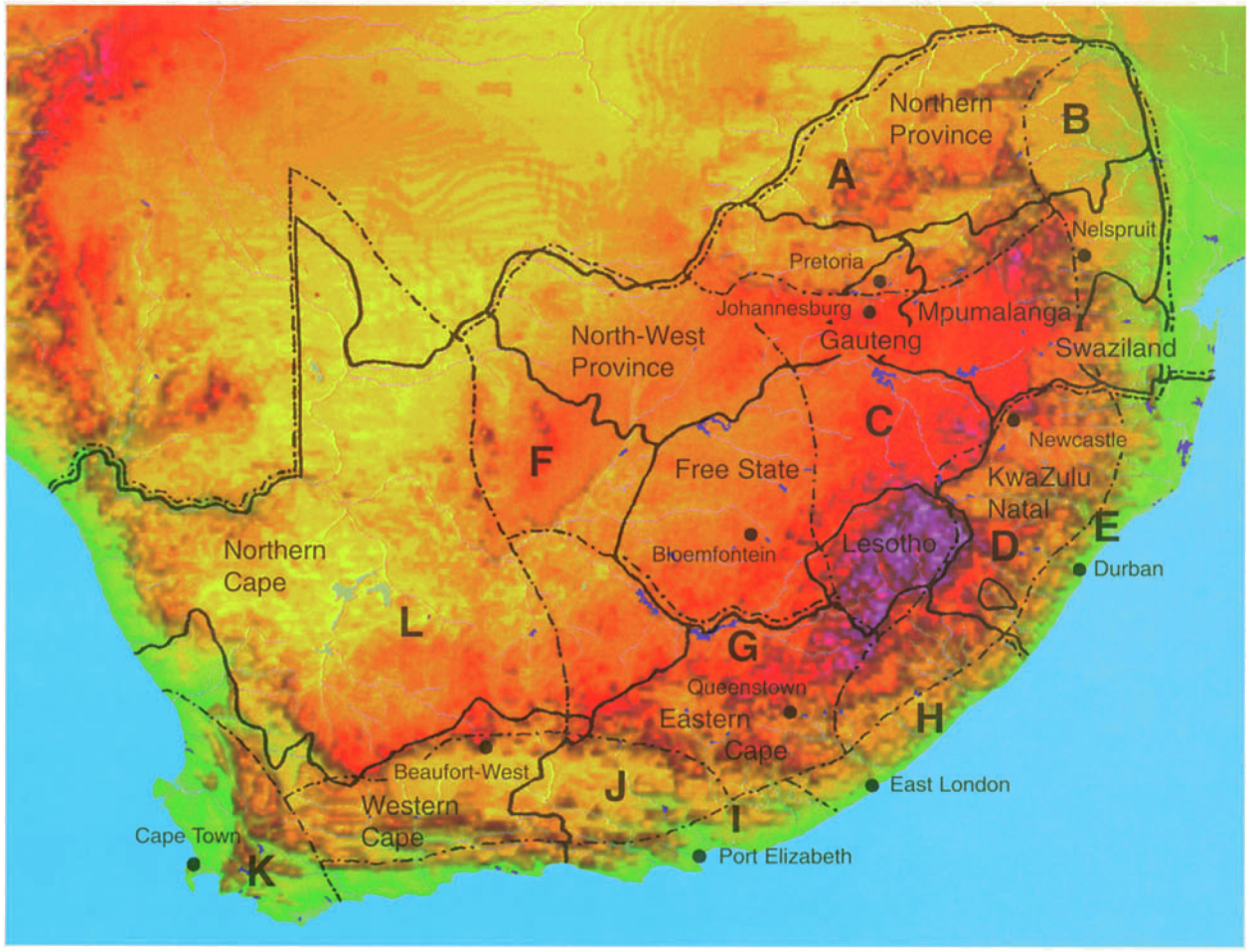
Growing South African Indigenous Orchids



KARSTEN H.K. WODRICH

GROWING SOUTH AFRICAN INDIGENOUS ORCHIDS



Map 1. Climatic regions and topography of South Africa. Colour map supplied by Dr O.Malan, Stellenbosch; climatic regions based on information from the South African Weather Bureau, Pretoria; provincial boundaries based on a map published by the Chief Directorate of Surveys and Land Information, Department of Regional and Land Affairs, 1994. Dots/lines: climatic region boundaries; solid lines: province boundaries; bullets: towns and cities; A-L: climatic region identifyers.

Growing South African Indigenous Orchids

By
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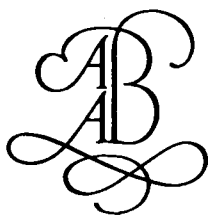

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To Mom, Dad,
Anke, Mariusz and Vincent

Preface

This comprehensive guide was born out of the frustration experienced in trying to obtain information on the cultivation of indigenous orchids. Although many excellent articles on orchid cultivation have been published in the *South African Orchid Journal,* in *Orchids* (formerly the *American Orchid Society Bulletin*) and in other national and international publications, there is still no single comprehensive guide available. The help of numerous dedicated growers, who shared their experiences and provided me with detailed notes on cultivation, has enabled me to compile this guide to the propagation and cultivation of indigenous epiphytic and terrestrial orchids.

Increased land usage and particularly wetland drainage for city expansion, agriculture and rural settlements have infringed on the natural habitats of many plant species with serious consequences for natural populations. Within the next few decades South Africa may reach the land usage percentage that some European countries have now. The risk of extinction of local populations and species is very real.

Because of this, successful propagation of wild orchids should be a priority. As plants grown from seed and from vegetative divisions and tissue culture become available, pressure exerted on natural populations by over-collection will decrease. In some instances it will be the only means of the species' survival where the natural habitat no longer exists.

The guide is a culmination of eight years of 'putting things together' and has been a rewarding learning experience in a process that does not end with the publication of this book. The world of orchid growing is changing constantly; new cultivation methods are tried by growers as is the experimentation with new and different seed germination and tissue culture media. Together with this there have been changes in the classification of orchid species in the recent years and new species are regularly being added to the impressive list of orchid species found in South Africa.

Acknowledgements

I am greatly indebted to the numerous growers that have contributed their experience and knowledge in growing many different species both in discussions and by tedious filling in of cultivation information sheets. Their generous contribution is acknowledged at the end of the relevant sections. Without their help this book would not have materialised.

To Miss E.-M.Cadell of Acorn Books a thank you for her support, advice and patience during the initial stages of preparation of the written part of this book.

A sincere thank you also to Prof. E.F.Hennessy, Mrs T.Hedge, Mrs J.Stewart, Dr L.Vogelpoel and Mr G.J.McDonald for their valuable time in commenting on and suggesting improvements to the manuscript and advising on botanical correctness.

The stimulating discussions on culture and seed sowing with Mr J.Holmes and his willingness and that of Mrs C.Coll, Mr H.Rogers and Mr M.Waltner to contribute towards the photography in this publication are greatly appreciated.

Dr L.Vogelpoel deserves a special mention for his constant willingness to share experiences and advice, and for his contribution not only in the field of indigenous orchids but also in the culture, judging and photography of orchids in general. I am particularly honoured to have been allowed the use of some of his superb photography for this publication.

My gratitude is extended to Mr D.McMurtry whose encouragement and help were not only instrumental in deciding to write this book but also awakened a keen interest in the propagation of South African orchid species.

Most importantly a thank you to my parents for their continued moral support and encouragement.

Thank you also to the team responsible for the publication at A.A.Balkema Publishers for their support, patience and expertise throughout the final stages of this project.

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CHAPTER 1

Introduction to South African indigenous orchids

1.1 GENERAL

South Africa is richly endowed with orchids. More than 430 species belonging to 53 genera are found in a variety of habitats. The reason for the species diversity is not difficult to find. South Africa has 12 climatic regions due to the varying topography and rainfall.

Approximately 10% of the species are epiphytic and are found mainly in the northern, eastern and south-eastern parts of South Africa. The term epiphyte is used for species that grow on trees. The roots attach themselves securely to the bark of the trees. No nutrients are derived directly from the tree as would be the case with parasites that penetrate the bark and tap into the nutrient and water supply of the tree. The epiphytic orchid obtains its nutrition from decaying leaves that accumulate on rough bark and in the crooks of branches. Rain may also wash bird droppings down the trunk and branches of the trees. The roots of the epiphytes are specially adapted for life in the trees. They are covered in a thick white spongy root-covering called the velamen. This is able to absorb nutrients and water and also helps to prevent excessive dehydration of the roots during the dryer period when there is a minimum of rainfall. Some species are found growing on rocks and are called lithophytes.

The majority of the orchids found in South Africa are terrestrial or geophytic. This term is used for species that grow with their roots firmly anchored in soil. Most terrestrial species are deciduous with a subterranean storage organ in the form of fleshy root-stem tuberoids that are replaced annually or persist at least for a few growing seasons. Another form of storage organ is the pseudobulb that helps sustain the plants during the winter or summer dry period. The root-stem tuberoid will be referred to as a tuberoid in the remainder of the book.

All colours imaginable are represented in the flowers of indigenous orchids. The first that comes to mind is the sparkling bright red Pride of Table Mountain or *Disa uniflora.* Just as spectacular are the bright yellow flowers of *Eulophia speciosa,* the green and white flowers of *Bonatea speciosa* or the pure white flowers of the epiphytic species *Mystacidium capense.* The prized blue colour is represented in a few species such as *Disa longicornu* and *Herschelianthe purpuras-*

cens. Even the brown to purple-black can be found in species such as *Herscheli-anthe lugens* var. *nigrescens.*

During the 1960s and 1970s interest in the growing of indigenous orchids flourished, marked by an increase in journal articles on culture. This declined slightly afterwards except for the successes that were attained in the 1980s with the evergreen group of disas and their hybrids. These are now being grown successfully around the world. Many of the epiphytes have been sought after plants for a few decades, while interest locally and internationally in terrestrials other than the evergreen disas has increased in the last ten years.

The purpose of this book is to give guidelines for the cultivation of many of the terrestrial and epiphytic species which are covered in Chapters 2 and 3 respectively. Hand in hand with successful growing of the orchids goes a sound knowledge of the origin of the species and the climate in which they grow. This is discussed in Chapter 1. Note that cultivation information is given for the southern hemisphere. Any information referring to a particular month should be shifted by half a year for growers in the northern hemisphere.

The last two chapters are devoted to the propagation of indigenous orchids from seed and by vegetative propagation or meristemming as it is known among orchidists. They serve as a basis for further work and experimentation by many devoted growers in the field of propagating some of the most beautiful and in many cases exceptionally rare species.

Indigenous orchids are protected plants in South Africa and it is *illegal* to remove plants from the wild without the relevant permits and landowners' permission. The legislation concerning the indigenous orchids is given in summary form in Appendix 1.

The methods of growing orchids discussed in this book have been compiled with the help of growers who have been using them successfully. This does not mean that the methods cannot be adjusted or even better means found for growing the different species. Most likely, methods have to be modified to suit local conditions. Furthermore one should never switch a complete collection over from one method of growing to another because someone else has had success with it. This could prove detrimental. Rather try the method on a few dispensable plants first. Wait a growing season and then judge whether the switch is worthwhile. This is particularly important with changing potting mixes.

With time one builds up a certain relationship with the plants and once one has come to know their needs and dislikes, one can start fine-tuning growing practices so that the plants produce an optimum in growth and flowers. Successful growing of orchids, particularly the terrestrial species, means that one is able to keep a plant growing and flowering for several years and not simply replacing a lost plant with a new one annually. The ultimate aim should be to propagate to conserve and enjoy the beauty and diversity of the species while doing so.

1.2 THE POWER OF OBSERVATION

There is one big secret to growing indigenous orchids successfully. Observe, ob-

serve and observe again. This not only goes for the growing area but also when visiting the natural habitat of the plants, when visiting other growers and when looking at plants at shows or on the local society plant table. Question those observations!

Why do the new tuberoids of my satyriums rot away at the end of the growing season just before dormancy? Tip the plant out of the pot and observe what is happening beneath the soil. Where does the rot start? Is it at the new tuberoid or does it originate from the old dying stem? What about the connecting tissue between the naturally dying plant and the replacement tuberoid. What if this rots away and in the process destroys the dormant bud on the replacement tuberoid? Some of the answers to these questions are given in the following sections.

As stated above observation in the growing area is important. This starts as soon as the door of the shade- or greenhouse is opened. Is the atmosphere buoyant and the air moving or is the air hot and stagnant? Remedial action can be taken immediately if something is wrong.

Daily visits to the growing area are essential. This should not become a tedious task – it should be an enjoyable experience. After all, what are many hobbyist growers growing orchids for? One thing is guaranteed: there will always be something new to see and it gives some time to relax.

One will often notice the methods of observation when visiting any successful orchid grower. Instinctively he will touch a leaf here and there, remove an old leaf from one of the epiphytes, lift a pot of a terrestrial species and gauge its weight and then prod the soil with his finger. Why this ritual? The leaf gives an indication of the well-being of the plant. If it is firm and cool to touch things are fine. If it has been turning limp over the last few days the root system may have developed a problem or the plant is getting ready for dormancy. The weight of the pot is a good indication of the amount of moisture still in the potting mix.

Watering should not be automated when growing terrestrials. Why? The power of observation is no longer effective and response to observed events is not made. A plant crying for help will go unnoticed and succumb. Insect pests go on a rampage while the owner of a collection is under the false sense of security that the automatic system is in control. On the other hand, watering plants individually ensures that one at least looks at the plant that one is watering and anything unusual is picked up immediately. The same goes for the epiphyte grower who does his rounds with a misting gun in the hand. As he moves from plant to plant it is given a very light misting. In the process he has to look at the plant and again has the chance to observe. It may simply be noticing that one of the species is doing particularly well on a certain type of wood mount that it has been tied to.

Observing the climatic conditions and plant growth habits in its natural environment is another piece of the jigsaw puzzle. Observation here can make the difference between success and failure of a species in cultivation. Examples of habitat observation and inference are given in Section 1.4. An attempt is made throughout the book to describe the different habitats as closely as possible.

Very often valuable tips are gained from conversations with persons who have seen the plants in the wild. Just an example. Someone has been up Table Mountain in Cape Town to see some of the terrestrial orchid species found on the

summit and remarks that he had to don a jersey and windbreaker when reaching the top although it was a hot summer's day at the foot of the mountain. The conditions must have been windy and cold up on the mountain. In other words there were cool conditions with excellent air movement. This is exactly what many of the species enjoy in cultivation.

Growing terrestrial species is considered something of a mystery for many because of the unseen processes taking place below the surface of the soil. Take the plants out of the pot and inspect what is happening below the soil at different times during the season. Through these observations the mysteries are solved and understanding the processes taking place will ultimately lead to better growing practices and success in growing the plants.

1.3 FACTORS DETERMINING THE GROWING CONDITIONS REQUIRED FOR ORCHIDS

Successful cultivation of both epiphytic and terrestrial orchid species is achieved by providing the plants with growing conditions closely resembling those found in their natural environment. For this reason sound knowledge of the climatic conditions, the natural habitat and the plant growth habit is an essential key to growing indigenous orchid species. These three factors are closely interrelated. Climatic conditions include rainfall, temperature and humidity. Before attempting to grow any of the species, also find out as much as possible about the natural habitat of the species involved. The light requirement of a species is an important detail gained from the knowledge of the habitat. Based on this information, a decision can be made whether available growing areas will fulfil these criteria.

If not, a suitable environment should first be created before the plant is obtained. For terrestrial species, growing areas can be divided as done in the detailed cultivation guide. This includes separating the winter from the summer rainfall species. For epiphytes a greenhouse may be required in colder areas while a shadehouse is ideal for both terrestrials and epiphytes in areas where the climate is mild throughout the year.

1.4 CLIMATIC CONDITIONS

1.4.1 *Rainfall and water requirements*

The first question to ask is if the plant comes from a summer or winter rainfall area and to determine how long the rainy season lasts. This will indicate when a dormant resting period is required. The terrestrial, winter dormant plants from the summer rainfall areas start showing signs of growth in spring from August to September. They grow and mature throughout the summer months. Some may flower in spring before any leafy growth appears. Others flower in summer or autumn. They usually go dormant in the autumn months of April and May.

Summer dormant species from the winter rainfall areas start sprouting at the

onset of the rainy season in March or April. Growth is triggered by lower temperatures. Plants grow throughout the winter months and most flower in spring. There are some summer flowering species such as *Disa harveiana* ssp. *harveiana* (Johnson & Linder 1995) and *D.ferruginea*. These two prepare for dormancy during flowering.

Watering the plants at the wrong time of the year causes the tuberoids or pseudobulbs of terrestrials to rot. This goes unnoticed until the plants fail to sprout the following season. Upon examining the contents of the pot one finds the decomposed remains of the plant. The same goes for the epiphytic species that all require a dryer winter resting period. If this is not adhered to they may not flower the following season or it may lead to root and growth rot.

The central, eastern and southern part of South Africa receives more rainfall than the western part and thus the majority of orchids are found in these regions. No epiphytic species are found in the winter rainfall areas.

1.4.2 *Temperature*

South Africa has countless differing climatic niches that are inhabited by orchids due to the varying topography, the difference in latitude from north to south and most important the differing altitudes of preferred habitats. Higher altitudes are associated with cooler temperatures. Coastal areas tend to be warmer, particularly along the eastern coast where the warm Mozambique ocean current running south contributes to these warmer conditions. The influence of the cold Benguela ocean current running north along the western part of the country results in cooler conditions prevailing there.

The amount of cloud cover affects the difference between day and night temperatures in winter. In the summer rainfall areas, the absence of cloud cover in winter causes increased radiation heat loss to the atmosphere. The result is low night temperatures. If the temperature falls below the dew point frost is experienced. An indication of the different temperature ranges experienced in the different regions is presented in Figure 1.

Another important consideration when growing terrestrials in a region with cold winters is that dormant plants must be protected from freezing temperatures. Even if the plants are growing naturally in that region, they are protected from freezing by the heat storage capacity of large volumes of soil surrounding the dormant storage organs. This is not the case for plants in containers.

1.4.3 *Humidity*

The relative humidity percentage is a measure of the amount of water vapour in the air. 100% relative humidity indicates that the air is saturated with water vapour. The relative humidity is strongly dependent on atmospheric pressure and temperature. A reduction of pressure and temperature decreases the water vapour holding capacity of dry air and thus increases the relative humidity. Once the humidity reaches saturation point at 100% water starts to condense in form of small droplets. This is evident in clouds forming due to moist air rising along