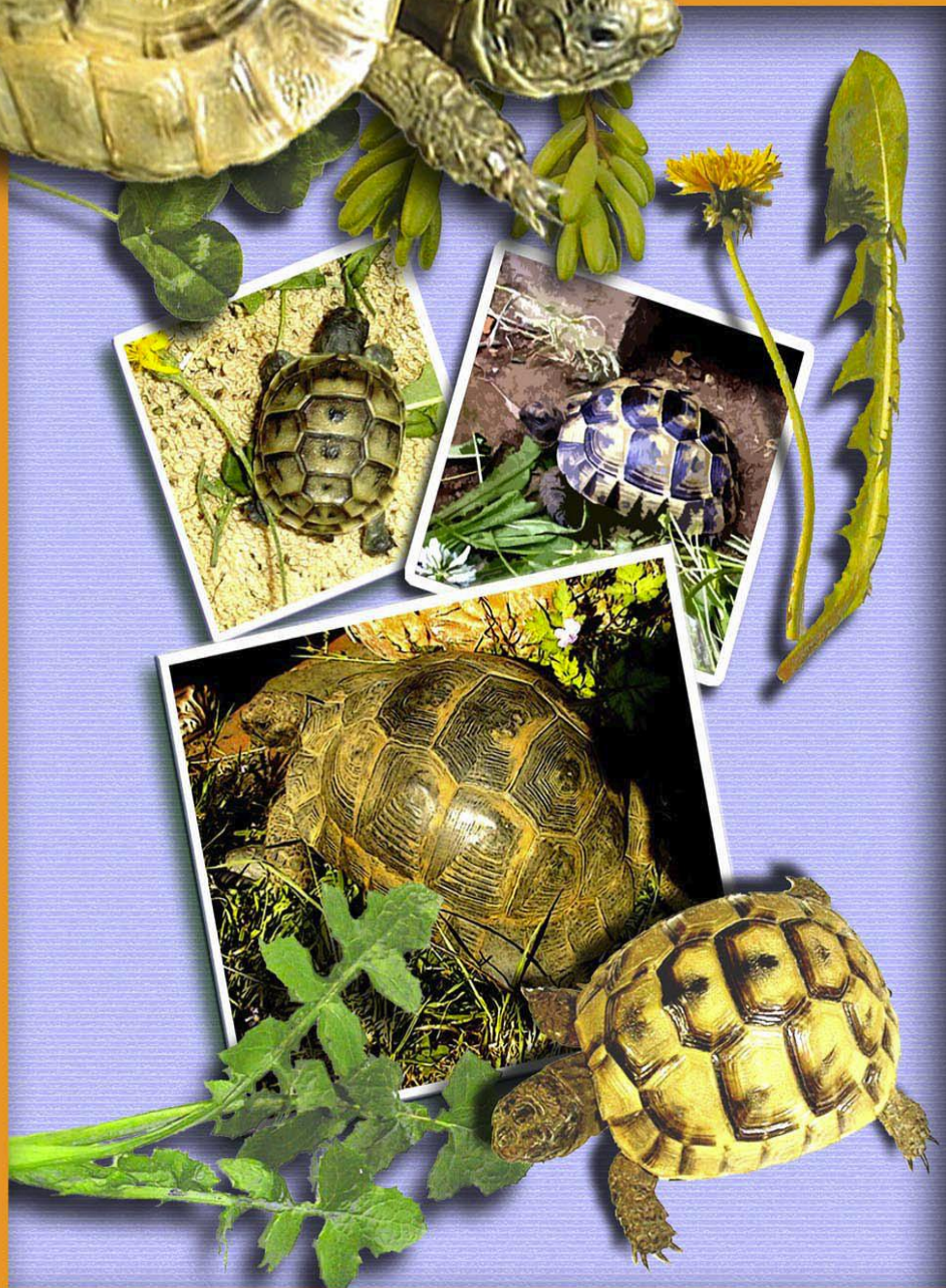


# A GUIDE TO REARING MEDITERRANEAN TORTOISES



*by* **LINDA E KING**



## INTRODUCTION

*Rearing a baby tortoise does require a degree of commitment to its welfare and will need some time and care and a little initial expense to create the right conditions.*

To help give you a picture of what this entails, I have gathered together my notes here in

**"The Tlady's Guide"**

# ***A Guide to Rearing Mediterranean Tortoises***

The first part describes the tortoises' wild lifestyle, the second describes ways of simulating this in captivity for babies and the third describes the care of adult tortoises.



## PART 1: TORTOISES IN THE WILD

*To rear baby tortoises successfully in captivity we need to know something about their natural lifestyle in their wild ranges.*

Mediterranean tortoises have evolved to thrive in hot, dry places where vegetation is often sparse particularly in summer. Typically they live on south-facing hillsides, sleeping at night under rocks and thorny bushes.

In the morning they emerge to bask in the sun until they are warm enough to become active then they trundle off for their morning forage, snipping off flowers and leaves as they go.

By late morning the sun is high in the sky and they return to their scrapes to pass the hot part of the day in siesta mode, often emerging again in the late afternoon for an evening feed, and so on throughout the spring and early summer months, their peak feeding period.

By midsummer it is very hot and there is little to eat and they may dig themselves in for a period of aestivation.

In the late summer and autumn they begin to wind down, eating less and finally stopping altogether. They remain awake with some activity until they have emptied their guts over a period of weeks then dig themselves underground for hibernation through the cold months, typically late November/December through to mid March.

The first warm days of spring bring them up again, emerging from the ground like so many mud-pies to bask and take their first feed of the year. Adults soon begin mating and the hills resound with the sound of clashing shells.

The females dig their nests and lay their eggs in May and June. The summer sun incubates the eggs and the babies emerge from the ground around September.

Many eggs and hatchlings are predated by foxes, hedgehogs and birds, but those which do survive live an identical lifestyle to the adults, totally independently, though very secretively, within a day or so of hatching. Typically around 10 or 12 years old they become sexually active, mating and producing fertile eggs for the next generation.

They can live for many years, at least 90, probably a good few more.



**This 'scraping a living' from the land seems a hard lifestyle to us but evolution has 'designed' them to fit this niche. Any attempt to 'improve' on this is likely to result in unnaturally rapid growth with consequent health problems.**

By its nature an English garden existence is a false improvement on the wild environment in that it is much 'cushier', food is more lush and plentiful, they don't have to walk about to search for it, and feeding activity can last throughout the day as it is not always hot enough to warrant a long siesta.

Hence more food + less exercise = unhealthy overgrowth. At the same time, our season is short and often broken up by dull and cool weather which is all very unnatural for a creature from Mediterranean climes - and the keeper's instinct is to compensate by even more feeding. In an adult tortoise this won't really hurt providing the diet is a correct one of a variety of wild and cultivated plants of the type eaten in the wild.

However in a baby tortoise, overfeeding can give rise to over-rapid growth causing peaking of the scutes and possible weakening of the underlying bone.

**Therefore we must improve on the captive environment in a different way, by lengthening the season at either end and imitating the sunny and sparse conditions of the wild, whilst providing shelter from the sun, cold and predators and a correct diet in terms of both content and quantity together with a natural and varied environment.**

Given these basic requirements and provided the babies are not subjected to stress in the form of careless handling by children, or attention from cats and dogs, there is no reason why they should not grow healthily and live a long and happy life.

So how do you do it? The key to the successful husbandry of any animal is to apply a combination of knowledge of its wild lifestyle and a degree of ingenuity!





## PART 2:

# NATURAL REARING OF TORTOISES

## Accommodation

The aim should be to imitate as closely as possible the wild environment whilst enhancing our poor season and protecting from predators.

Tortoise rearers have devised various methods, including units on workbenches with planted seed trays, brick-built raised beds and enclosed garden runs with access to part of a greenhouse, conservatory or cold frame.

The precise construction and location of yours depends on the layout and aspect of your garden - a really sunny and safe spot is needed, not overlooked from the road.

Barriers should be opaque or they will try to get through them and netting on barriers should be avoided as tortoises use it like a ladder!

Access to the outside is absolutely essential. The babies should be outside whenever it is warm enough even if not sunny as they need UV light to properly metabolise their food. Remember UV does not pass through glass or plastic. They can cope with rainy days too, if part of their area is glass or plastic covered and the ambient temperature is warm enough though they will only behave really naturally on sunny days.



It is vital to keep stress to a minimum; the less interference there is with their daily lives, the happier and healthier they will be.

To achieve this you need to prepare a secure sided outdoor unit or area chosen for its sunny position (all day if possible) with rocks, gravel and soil, planted with food plants and shelter shrubs, with a small sleeping cave (protected from wet) and a shallow, 'wadable' water pot.

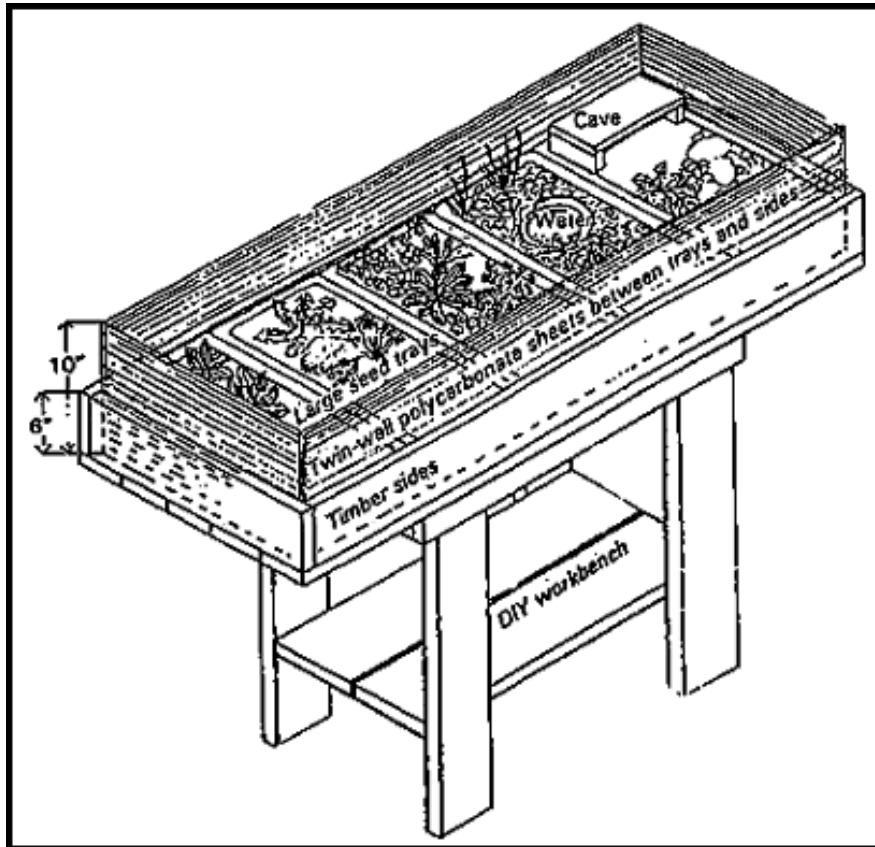
A light open mesh should be placed over the unit to protect against dogs, cats, foxes or large birds but try to keep shadow to a minimum, though of course some shade is absolutely essential.

**Points to bear in mind: Bigger is better, grass is a nuisance (it takes over) and they enjoy clambering and burrowing. They are also very good escapers - take special care with corners which they use in the same way that rock climbers use 'chimneys'!**

A **raised up** unit will be more secure, easier to tend and catch the sun for more hours. The tortoises can certainly be left outside at night in summer in a wooden house or stone cave but do protect from rain, foxes, hedgehogs, rodents etc.

### **An outdoor Workbench Unit for hatchlings**





### Materials

- Cheap, ready to assemble, wooden workbench (from DIY store).
- 4 lengths of wood for the sides, 10" deep (avoid toxic wood preservatives)
- 5 Wards large plastic seed trays with holes (These are quite expensive but strong and convenient for planting and replacing. Alternatively make an inner wooden wall where the edges of the trays would be and plant directly onto the bench, but wood will rot, so you will need to use a metal topped bench if going for this option.)
- Clear twin wall polycarbonate sheeting, 6" deep, to slot between the trays and the sides.
- Plastic covered mesh panels or clematis support to go over the top.
- Glass or plastic sheet or small double-glazing panel to make a dry end.
- Rocks, soil, gravel, food plants, shelter plants, sleeping cave, water dish.

**Safety and security are important factors to consider. The unit or enclosure must be totally tortoise proof from inside, animal proof from outside and should be sited where not overlooked from the road where it could invite theft. Protection from dogs, toddlers and footballs is required!**



## Outdoor accommodation for Juveniles

As the babies grow bigger, they will grow out of their raised unit and should be provided with a good sized and securely enclosed sunny area **of the** garden in which their food plants grow and there is ample basking for a good portion of the day.

They need some stony ground or concrete as well as soil and grazing areas, plants and rocks to shelter under and climb on, and a shallow water pot.

My own juveniles have an area which is sloped towards the sun and surrounded by a low brick wall, enabling the soil level to be raised inside. The substrate is just normal garden soil.

If space allows, consider a tall net fruit-cage which offers complete protection and ease of access for you.

## Indoor accommodation

All the methods I have described are for the outside; but some form of indoor unit is needed too, particularly during the spring and autumn months, to extend our short summer at either end, as no more than 9 or 10 weeks hibernation is advisable for youngsters, 8 or 9 for hatchlings.

When they are bigger, various good solutions can be devised combining a greenhouse or conservatory with access to the outside so they can choose to either go out when they are warm enough, or bask inside when it is cool. Whilst they are young though, they will need an indoor unit equipped with the new **Combined Heat and Light** bulbs (such as the Arcadia D3 UV Basking Lamp) which combine the benefits of a Full Spectrum light and basking light in one bulb, and have superseded the old, much less effective UV strip plus basking lamp arrangement. They are proving very successful, producing a superior level of UV far closer to natural sunlight than the old strips and are highly recommended. Don't be tempted to buy a heat mat as this is unsuitable and unnecessary.



The best temporary **substrate** I have found for small tortoises in indoor units is a towel stretched over the base - they can grip it with their claws to right themselves if they capsize, and it can be washed in the machine (without detergent). More towels can be formed into 'hills' to climb on, shelter under and burrow into, and to form ramps up to planted seed trays and water pots. **But that is a very temporary solution** because it does not allow for temperature regulation. Being exothermic, tortoises can only control their temperature by moving between warmer and cooler spots and that includes digging into the soil or under plants and rocks in the hot part of the day and also at night, and for proper heat exchange to take place the substrate needs to be **dense and humid**. Therefore loose, dry substrates like pellets are unsuitable. For my hatchlings and yearlings I use well soaked Coco coir, such as Habistat Coir block, prepared a day or so before use to eliminate the initial coir aroma. After that the youngsters live at ground level with access to both greenhouse with lamp and outside area, so they can dig into the soil at night and they also use a wooden sleeping box when a little older. The huge advantage of providing a humid substrate for them is that it counteracts the drying effect of the lamps on the keratin, helping to keep them growing smoothly and avoiding ridgy growth and pyramiding.

It is a good idea to provide a **flat stone** or slate to keep claws from overgrowing. If the tortoises' food is placed on this, it will also ensure that their beaks are kept naturally trimmed, as when grazing outside. Whilst well able to tolerate low humidity conditions in the wild, they do appreciate an occasional lukewarm shower with a fine rose watering can when out in the sun and should be 'misted' when in indoor units to prevent over-drying and so avoid eye and respiratory problems. **Clean water** should always be available.

## ***Constructing an indoor unit***

Many people assume that a glass fish tank will make an ideal vivarium for young tortoises, but these are **wholly unsuitable** and should be avoided. Something which is **more open and airy** provides a healthier

atmosphere and is easier to keep clean. An open topped table arrangement allows the tortoises to move closer to or away from the heat and hence they can control their own temperature ('thermoregulate') as they do in their natural habitat. In an enclosed unit, a tortoise is unable to move away from the heat; please don't use one!

This potting bench, found in a garden centre, needs little more than slightly higher walls and a front strip, to be ready to use and is a cheap and easy option.



This smaller, light-weight one just needs a front panel.

(If using a ready-made bench, do please ensure that the wood has not been preserved with harmful chemicals.)

Be aware that these provide a very small area and will only be suitable for providing temporary accommodation for hatchlings and very young tortoises. You can line the wood with pond liner which stops the moist substrate from rotting the wood.

Alternatively, here is a way of making your own:

### ***Making a Tortoise table***

A simple and effective indoor unit can be made on a **tabletop** (a school desk about 4' x 2' makes a good base) with low twin-wall polycarbonate or clear **plastic walls** fixed at the corners, and a **towel** stretched over the base to give firm footing. Add another towel for climbing on and hiding under plus a heavy shallow **water pot**.

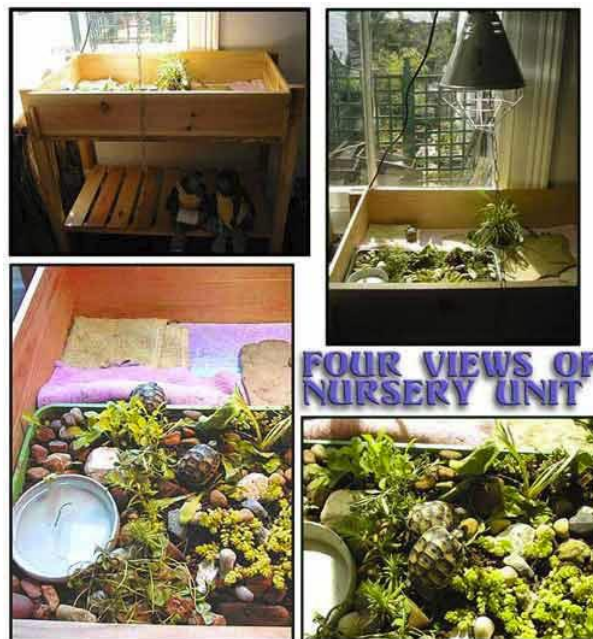
## Heating and Lighting

The most effective arrangement is to use a 100 or 160 watt Arcadia D3 UV Basking lamp or Zoomed Powersun flood lamp as shown in the nursery unit below, which **combine heat and UV** and are highly recommended for strong bone and shell growth. These bulbs are relatively expensive but are effective for two years. They cannot be run through a dimmer switch but I have never found this to be a problem. (Note the lamp should be no higher than 12 or 15 inches above the tortoises and that the lamp is higher in the picture just for the purpose of the photo.)

It is vital to provide a **temperature gradient** within the unit so the tortoises can thermo-regulate. They need a cool spot with shelter at room temperature (approx 20°C) as well as the hot spot under the basking lamp (approx 30-35°C).

Similarly a daily temperature cycle is important so the night-time temperature should be allowed to drop to normal room temperature (approx 17-20°C) at night, just as in the wild.

Use a **probed thermometer** to monitor temperature and a **time switch** if needed to control day length.



A 'T-table' in use



### PART 3: **DIET AND HEALTHY GROWTH**

**Resist the temptation to overfeed; feed the right diet (see food plant list) but not too much of it!**

Tortoises have evolved to thrive in subsistence conditions in hot, dry places where vegetation is often very sparse. They eat morning and evening, sleeping during the hot part of the day; in the wild they are not constantly woken up and offered heaps of succulent food! They have to walk and scramble as they search for food plants, biting off flowers and leaves as they travel, hence they use energy and develop muscle. The growth rings on a wild tortoise are even and flush with the curve of the shell and the scutes form one smooth overall dome shape without 'bumps'.

If overfed, even on a good wild diet, the growth will be too rapid, growth rings will be raised and the shell become peaky (known as pyramiding). Much worse, on an **incorrect** diet including such unnatural items as dog and cat food, cheese, bread, cornflakes, etc., (never encountered in the wild!) a tortoise will be a very sorry animal; soft shelled, deformed and weak and with potentially fatal kidney and liver problems. **Metabolic bone disease** (MBD) is a common cause of captive reptile fatalities and is caused by insufficient Calcium being laid down in the bones and shell (see section on Calcium and Vitamin D3). This can be avoided by ensuring your tortoise gets sufficient exposure to UV light (real sunlight or Heat and Light bulb) which enables it to produce Vitamin D3 in the body, essential for metabolizing Calcium. For a 'belt and braces' approach, add Vitamin and Mineral supplement made for tortoises to the diet, especially when the weather does not permit outdoor sunlight exposure.

The diet should be **vegetarian**, adequate in **moisture**, **high-fibre**, **vitamin** and **mineral rich**, **low-fat** and **low-protein** - so even high



protein vegetables should be avoided (e.g. peas, sweet corn, bean sprouts) to achieve a **gradual, even shell growth**.

Many of the plants on the following **Food Plant List** are relatively high in calcium, vital for forming shell and bone and this should be **supplemented** with and a daily dusting of **calcium** and a suitable **vitamin and mineral supplement** such as Vionate, Nutrobal, Reptavite or Repcal, plus **cuttlefish bone** (sharp edges removed) which they will bite at from time to time.

### **Growth rate**

The rate of growth can vary a lot between individuals, even within the same clutch, but a rough, 'handy' size guide is:-

- 1 year - length of little finger**
- 2 years - length of ring finger**
- 3 years - length of middle finger**
- 5 years - length of palm**
- 10 years old - length of hand**



**Don't try to grow them faster! Aim for a slow, even growth like the wild ones.**

If they have a good variety of wild food plants to graze on there is no need to add any extra food, if not, feed them in the morning when they

have basked in the sun and become active, and again in the mid to late afternoon after their siesta.

It is useful to **weigh and measure** the growing youngsters regularly to build up a **record** of growth patterns and alert you to unusual weight fluctuations which could signal poor feeding or dehydration. Don't panic though - a 'poo and a pee' can make a big difference to a juvenile's weight.

## *How to measure your Tortoise*

*1. Place the tortoise against the wall on a sheet of paper, place a straight edge vertically at the tail end and make a mark as shown.*

*2. Measure from the wall to the mark and you have the Straight Carapace Length (SCL).*

*Do **NOT** measure over the dome as this will throw out your calculations wildly!*



## Food Plant List

This is based on my observations of plants eaten by tortoises both in the wild and in English gardens. It includes plants from a variety of botanic families to ensure a good balance of nutrients, vitamins and minerals and to avoid 'dependence' on a single food.

Dandelion	<i>Taraxacum officinale</i>
Hawkbits & Cat's-ears	<i>Leontodon</i> & <i>hypochoeris</i> spp
Hawk's-beards	<i>Crepis biennis</i> & <i>capitallaris</i>
Nipplewort	<i>Lapsana communis</i>
Chicory	<i>Cichorium intybus</i>
Sow thistle	<i>Sonchus oleraceus</i> & <i>arvensis</i>
Plantains	<i>Plantago major</i> , <i>media</i> & <i>lanceolata</i>
Mallows	<i>Malva sylvestris</i> , <i>neglecta</i> & <i>moschata</i>
Shepherd's purse	<i>Capsella bursa-pastoris</i>
Bittercress	<i>Cardamine hirsuta</i> & <i>flexuosa</i>
White/Dutch clover	<i>Trifolium repens</i>
Red clover	<i>Trifolium pratense</i>
Common vetch	<i>Vicia sativa</i>
Bush vetch	<i>Vicia sepium</i>
Tufted vetch	<i>Vicia cracca</i>
Sainfoin	<i>Onobrychis sativa</i>
Creeping Bell-flower	<i>Campanula rapunculoides</i>
Bindweeds	<i>Convolvulus</i> & <i>calystegia</i> spp
Stonecrops	<i>Sedum album</i> & <i>spectabile</i>
Hedge mustard	<i>Sisymbrium officinale</i>

They are also very fond of cultivated forms of the mallow family such as **Lavatera** flowers and the leaves and flowers of **Hollyhocks** and **Hibiscus**.

Many of the **Campanula** family leaves and flowers are also enjoyed, and there is no harm in adding any home grown lettuce thinning going spare! Growing **Land Cress**, **Endive**, **Chicory** and **Rocket** is also easy and useful.

Small sedums can be very easily propagated to fill seed trays for additional feeding and dandelion and sow thistle seedlings can be grown from the 'clocks' or transplanted from the garden into pots. Clover and hairy bittercress also grow well in trays and pots and can be harvested every few days.

### **'The Tlady's Mix'**

**I have formulated a seed mixture based on this list which is now available to buy from Herbiseed.**

**For details, planting advice and ordering go to:**

**[www.herbiseed.com](http://www.herbiseed.com)** Phone: 0118 934 9464

May, June and July are the optimum feeding months. Do not be alarmed when their feeding slows down towards the end of August and September, this is normal.

The **illustrations** of the plants in this list can now be downloaded as a zipfile from the link here:

**[www.tlady.clara.net/TortGuide/Diet.htm#plantlist](http://www.tlady.clara.net/TortGuide/Diet.htm#plantlist)**

to print your own reference booklet. There are ten A4 pages with two species illustrated on each, plus a front and back cover. For best results save to disk, open in your image editing program and print on photo paper at at least 150 dpi.

To print with the correct layout, in print Properties click the Layout tab and check 'Reduce/Enlarge' and 'Fit to Page' with A4 selected. (Don't check Centered.)The sheets can then be halved and assembled in an A5 display book.



All images are copyrighted but may be copied for educational purposes.

Edible wild plant mixtures are available from some of the organic seed companies. You will discover by trial other garden and rockery plants which they will eat.

The **occasional** addition of lettuce and cucumber will not hurt if nothing else is available and can provide valuable moisture in dry weather, but these should **never** form the staple diet owing to their extremely **low nutritional value**.

**Fruit** such as tomatoes, apple, plums, peaches and melon should be **avoided** as the sweet, wet conditions created by these foods often cause certain gut flora to 'bloom' resulting in gut irritation signalled by rather wet droppings often containing undigested food. This is both unpleasant and detrimental to your tortoise's health. The very *occasional* treat such as a strawberry or tomato slice will not hurt and can be a useful way of delivering medication when necessary, for example worming meds. But note the word 'occasional'!

## Notes on Feeding and Nutrition

Food picked from outside your garden should be **thoroughly washed** to remove any chemical residues from spraying and traffic and of course you must **avoid any use of toxic chemicals** in your garden, e.g. slug killer, ant killer, pesticides, herbicides - none of these is safe.

Try to feed picked food as **fresh** as possible to retain the **vitamin content**, preferably morning (after basking) and mid to late afternoon (when they emerge from siesta) though it can be kept quite well in a plastic bag in the fridge for a couple of days. For very small tortoises chop the leaves to a manageable size with scissors just before feeding.

It is important to provide the opportunity for the youngsters to **graze naturally** on food plants growing in their areas. This way they will develop muscle and keep down their beaks and claws. This of course means planting and nurturing some of the very 'weeds' you have previously tried to eradicate from your garden - you will learn to love them!

**Avoid toxic plants** such as daffodil, ragwort, spurge, columbine, hellebore, delphiniums, larkspur – you will need to familiarise yourself with identifying wild and cultivated toxic plants and there are plenty of web pages to help you. In my experience, tortoises will generally avoid them, but you may inadvertently mix them in with other leaves. To be safe though, remove these from tortoise areas, particularly where the youngsters are, but there is no need to rip them out of your garden!

**Avoid high-protein plants** such as peas, beansprouts, sweetcorn – being seeds they are very high in protein so in excess they can not only cause over-rapid growth but also seriously affect calcium metabolism, owing to their high phosphorus to calcium ratio, resulting in over large, soft shelled juveniles.

**Avoid** plants with a high oxalic acid content like spinach, sorrel and kale

**Avoid high sugar foods** e.g. fruit in excess.

**Avoid high phosphorus foods** e.g. banana – also quite addictive.

**Avoid especially all unnatural foods**, particularly high protein and high fat foods like meat-based dog and cat foods, which are without doubt **highly** damaging to the growth and health of tortoises.

If in doubt about a particular foodstuff, ask yourself: **Would the tortoise be likely to find this in the wild?** If the answer is a resounding **NO** as in the case of dog and cat food, dairy produce, meat, fish, etc, then **DON'T FEED IT!** It will only cause long-term health problems and is totally unnecessary.

### **Calcium & Vitamin D3**

Tortoises, particularly growing babies and egg laying females, naturally have a high calcium requirement. Vitamin D3 is needed to render the ingested calcium available to the body. The tortoise's body has evolved a mechanism to manufacture D3 through exposure to UV light i.e. the abundant Mediterranean sun.

This is why we need to ensure D3 is available both through **dietary supplements** and by provision of **Full Spectrum Light** in the form of Combined Heat and Light bulbs. This is particularly vital when summer sun is in short supply or the tortoises are indoors in cool weather, if we are to avoid calcium deficiency giving rise to metabolic bone disease (MBD).

With a wide variety of plant species offered, there should be no problem with providing a range of nutrients, but the smoothest shell shape and healthiest growth is achieved in my experience by lightly dusting the food once daily with calcium in the form of Limestone flour, plus a specially formulated vitamin and mineral supplement such as Reptavite, Vionate or Nutrobal.

**NB** As D3 is toxic in overdose, reduce the amount and frequency of supplementation when the tortoises have good exposure to summer sun, but keep supplying calcium in the form of pieces of cuttlefish bone which they will sometimes bite at, and sprinkling food with calcium carbonate powder (limestone flour) or scraped cuttlefish bone.

**NB** Combined Heat & Light bulbs last up to two years but the transmission of the ultra-violet part of the spectrum gradually reduces over time and I am inclined to renew them yearly.

## Water

Whilst it is true that tortoises are very efficient at extracting moisture from their food, drinking helps them to **flush waste** and toxins from the body and ensures good **hydration** of the tissues. Wild tortoises certainly drink when they get the chance and babies love to drink and wallow. Provide a shallow **drinking dish** e.g. a plastic plant pot saucer weighted with gravel.

Babies like to bask and wade in this too. (They will probably be inspired to use it as a toilet too, so **change** the water frequently!)





## Husbandry through the year

### Late Summer and Autumn, preparing for hibernation

It is not advisable to allow very small tortoises to hibernate for more than about 10 weeks, say from late December until early March, hatchlings more like 9 weeks, so it is necessary to 'stretch' the summer at both ends using your **indoor unit**. This normally comes into use in **September** when the nights start cooling off and you will need to **bring in the babies at night**.

Whilst the days are still warm, they can go outside during the day. (Be very careful when there is danger of **frost** - always bring them in). Gradually they will be spending more time in the indoor unit or greenhouse in which you need to **simulate summer** using the equipment described. Try to place the unit in a **bright** place and where the night time temperature is not less than 12°C.

**Between October and December**, gradually **shorten the day length** a little at a time from 12 hours down to 8 (manually or using a time switch) and gradually **decrease the temperature** by raising the basking light a little.

During this period they will gradually **wind down their eating** and activity. They are **emptying their guts** ready for hibernation. This is both natural and **vital**, and sufficient ambient heat is needed for this to take place; if not, there is danger that the tortoises will go into hibernation with **a full gut, the commonest cause of hibernation fatalities**. They know instinctively what to do and we should not encourage them to eat any more than they choose to at this time, rather the opposite. They need a period of three to four weeks (dependant on the tortoise's size) without food but with temperatures sufficiently high to continue digestion. A few **warm shallow baths** during this time will help them to 'empty down' and ensure they are sufficiently hydrated. As the night-time temperature should not fall below 10° or 12°C during this period, some additional background heat may be needed if the unit is in a very cool room. **Do** allow the



temperature to drop at night, as this helps to signal to them that winter is coming.

Because of this gradual winding down of day length and temperature, they will spend a little longer each day hiding as they sense the approach of winter, until finally they cease to emerge at all and are ready to hibernate.

## Hibernation

At this stage I put them in a **cardboard box** containing **shredded newspaper** and put this into a thick-walled **polystyrene box** (of the type used for transporting tropical fish) with several small **ventilation holes** penetrating both boxes, and more shredded paper filling the space between the outer and inner boxes.



This goes first into a **cool** room and finally into a **frost-free, unheated** utility room - garages and attics can get too cold. **Check** regularly that the babies are not trying to climb out - normally they will **dig down** to the bottom to hibernate.

It is vital to **monitor the temperature** with a max/min thermometer. (The digital type with a probe is the most accurate). You can buy these with an alarm fitted to signal if the temperature falls too low. If the

temperature falls below 1°C there is **serious danger** of the tortoise's tissues being frozen and equally, if it gets too much over 10°C for more than a couple of days, the tortoise could become active, start to use energy and even try to climb out, so you may need to move the box to achieve the correct temperature. Around **5°C** is ideal. It is sensible to place the box on a raised table that is not climbable by mice or rats should any rodents gain access to the room or garage.

To prevent temperatures falling below freezing, I use an oil filled radiator on a 'frost' setting in the hibernation room.

**NB Hibernation is an important part of your tortoise's natural cycle and should only be avoided if it is underweight or sick.**

## Early Spring

In the spring this process is reversed: around the middle of March or when the weather suggests it, get the indoor unit ready and bring the hibernation box into a warm room. After a while (up to a day) you will hear rustling and they will come up to the top. Pop them in a really bright place (sunshine or Basking light). Give them a shallow lukewarm bath, allowing them to drink, warm up and soak, offer some young dandelion leaves and they should be up and running within a few hours.

As before, use a thermometer to monitor the temperature (aim for 15°C at the cold end up to 30°C under the light) and control day length manually or with a time switch.

As the season warms up they can go **outside on warm days** (and in again at night) until it is warm enough to leave them out all the time, perhaps by late May, and another season is underway!

## Summer

During the summer months the youngsters will come into their own as they respond to temperatures closer to their natural climate. They will develop their own routine of basking, feeding, exploring and sleeping whilst you observe them, provide good quality wild food and keep their areas tended and safe.

**They are tough little creatures and will do fine with the basic conditions described. Do monitor them well but don't coddle them too much!**

## Daily Care

The babies will need some daytime **checking**; although they can look after themselves perfectly well, they do sometimes get themselves the wrong way up and can't always right themselves. This could be potentially dangerous if under a lamp or in hot sun. (Plenty of stones and plants help to deal with this in outdoor environments; towelling is the best solution in indoor units) .

You will need to train a friendly neighbour to cover for you if you go away. If you go away a lot, or are usually out during the day, you will not be around during their activity period and so will be unable to observe their feeding, behaviour and health. If this is the case you should think again about the responsibility of taking on young tortoises, animals with the potential to outlive ourselves, and even our children, given the right care.



To complete the care picture, I am including the following article by a colleague.



### **PART3: CARE OF ADULT TORTOISES**

(adapted with kind permission from a paper by Glenys Crane)

Tortoises are reptiles and therefore 'cold-blooded'. When the weather is warm they are warm and when it is cold so are they. They have been one of the world's most successful inhabitants, perfectly evolved to suit their environment, climate and food plants. Then we expect them to live in England where:-

1. The winters are too long, meaning an extended hibernation period.
2. The summers are too short, not always giving enough time for them to eat a good variety of cultivated and natural foods to enable them to gain weight, remain healthy and enjoy themselves.
3. Our springs and autumns linger on interminably, not warm enough to induce them to eat yet not cold enough to stop activity, using up their valuable reserves and decreasing their weight. There is also the very real danger of a sudden frost causing fatalities. You will become an avid follower of the daily weather forecasts! These are the two seasons you are most likely to have to keep your tortoise indoors under a heat lamp to give him access to a 'summer' temperature of about 16°C at the cool end of his pen to a maximum under the light of about 28°C (it must be a light, not a ceramic-type heater, as they need the benefit of light stimulation). Having him wandering about the living room or kitchen is not good enough. At floor level he will be too cold and will have no appetite. And your carpets will never be the same again! This is the time your tortoise might drive you mad as they are not the tidiest of creatures, prone to scrape up all newspaper substrate and defecate over food, churning all into a very smelly 'soup' before sleeping on it! Many become very restless indoors, being independent characters who prefer the outside.

There is no doubt about it, it is quite hard work to keep a tortoise healthy and happy in this country and it is quite a commitment to your time. If you are out at work all day you will hardly ever see your tortoise as he will awake after you have left the house and be asleep before your return. Consequently you will have no idea how he is faring and you will not find him a very rewarding pet.

Tortoises like a lot of space and the freedom of a south-facing garden, which



contains a lawn with clover and dandelions on which to browse, flower beds and rocks upon which to clamber would be ideal. They love sunbathing on concrete paths at the beginning of the day, which soon become as snug as warm toast and they then become very active and agile. Drinking water should always be available in a shallow receptacle sunk into the ground such as an old plate, cat tray or plant pot saucer. They need to wade in and put their heads down to drink. You may never see them do this as they derive a lot of moisture from their plant diet but they do occasionally surprise you.

If he has to be in a pen, make it large and of varied terrain, with a stony area for his claws and access to sun and shade throughout the day. Ensure the walls are escape proof, tortoises are agile and persistent and can easily climb wire fences. A solid boundary also prevents him looking and fretting to where the grass is greener. Always ensure he is in a purpose-built rain proof house or stone 'cave' at night as foxes often 'play' with tortoises they discover. He may only receive teeth marks on his shell but he could lose a leg.

Ensure you find a vet who deals with reptiles as their whole metabolism is so different to 'normal' warm-blooded pets that many vets have not found it necessary to study them. Some vets will honestly admit they don't know much about tortoises but beware the ones who don't wish to lose face and bodge along as best they can. You will need to track down an Exotics vet in your area.

Injections can prove detrimental and vitamin injections should never be necessary to an animal with adequate varied diet. It's easy to overdose a cold-blooded animal whose slow metabolism may not adequately use up an administered drug.

When you first acquire your tortoise he may go 'off colour' and quiet. Just because he's cold blooded doesn't mean he hasn't any feelings, he will be missing his old familiar surroundings and may take a week or two to get used to his new home and routine.

If you keep more than one tortoise you will soon see they all have individual personalities, likes and dislikes. If you have males and females you must be prepared to have a separate area for the males, who quickly become over-amorous (to put it politely!) and give the females no rest, causing stress and related illnesses as well as actual bodily harm due to butting and love-biting! In the wild tortoises can spend many days without encountering each other but in the confines of even a large garden they are all unnaturally close.

If your tortoise seems to prefer only a small variety of food it may be that this is all a previous owner has offered - if so do persevere to introduce new tastes. They get to like many things but easily get 'hooked' onto a favourite, to the detriment of their health. They can also get habituated to being hand fed, say after nursing through an illness and it may be quite frustrating to try and

get them to feed independently again. They also seem quite seasonal in their tastes, shunning one thing at a particular time which they adore at another so keep persevering.

It is an excellent idea to weigh your tortoise regularly and check him for swellings etc., (if an abscess is allowed to form, the pus, the consistency of a hard-boiled egg yolk in a tortoise, can eat into and destroy nearby bone tissue). You will soon see a picture of his annual weight fluctuations and gain a better idea of if he is thriving. If he seems at all seedy do not hesitate to seek medical advice as, with his slow metabolism, if you wait until he really looks bad it will probably be too late to treat him. He should be bright-eyed and alert, walking with his shell raised off the ground.

If well fed, he can also be very indolent and spend most of the day lolling in the sun, often stretched out to expose as much skin as possible to the sun.

Many people recommend de-worming at least once a year, each summer. It's easy for captive tortoises to get quite a build-up of worms, which doesn't help their general health, due to re-contaminating themselves because of a build-up of faeces in a contained environment. You should keep their areas extremely clean.

If your tortoise is not heavy enough to hibernate, or shows signs of ill health you must be prepared to keep him awake all winter - a quite demanding, smelly and expensive business. If you cross your fingers and hibernate a suspected ill tortoise you will probably find either a dead or much sicker tortoise in the spring and will pay for the quiet winter with heavy vets bills and intensive nursing which could include daily stomach tubing. Hibernation itself, anyway, is not without its chores as you have to monitor the temperature of the area in which the tortoise is hibernating as a freezing temperature causes the brain tissues to freeze.

If you wish to have a tortoise as a pet for a child please think again. They are certainly endearing creatures of great character but children generally soon lose interest as they are not cuddly, soft or warm and their strong legs and claws soon prise off the grip of little fingers wanting to hold them. A guinea pig or a kitten would be a much better choice and much less hard work. Tortoises are by far the most demanding animal I have ever owned out of quite a varied selection. Forget about the time when nearly every garden had a tortoise - nearly every tortoise died during hibernation then, mainly due to the ignorance of its owner and we are still learning . . .

Always remember, a tortoise will only function well at the temperature it was 'designed' for - not our English climate. It's up to you to ensure it is kept in an environment and temperature as much like its country of origin as possible and

to this effect you will probably become a devoted follower of the weather reports.

Having laid down these rather daunting facts, once you have got used to all their special requirements, you will find them rewarding individuals to know.

These notes are by no means meant to be comprehensive and are only my personal thoughts and observations based on many years experience, discussion with other tortoise keepers and reading of the ever expanding literature available.

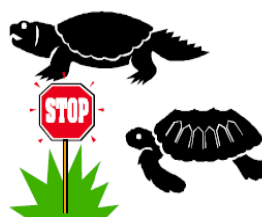
*Glenys Crane*



**NB** All the notes in this document apply to **Mediterranean land tortoises, such as:**  
*Testudo graeca*, *Testudo ibera*, *Testudo hermanni*, *Testudo marginata* and *Agrionemys horsfieldii*



... and should **not** be applied to other species such as Leopard tortoises, Red-footed tortoises, Box turtles or Terrapins, all of which have completely different requirements.



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