



Limette

Budding of Citrus trees

Most home growers have the problem, not be able to bud their Citrus trees by their own. Usually they need help and most Tutorials about budding are seldom at hand, if it goes to the practical part.

Limette No. 15 should help you. This issue will manage the two most used and easy to do budding methodes, the Inverted T-Bud and the Chip-Bud method. Both are favourable and will ensure best results through the complete growing season. Also both can be used to bud more than one variety to a single citrus tree, making the tree bearing a wide range of varieties, a so called cocktail tree, if you only bud twigs and branches with different varieties.

Also it will help, to but your own rootstocks with valuable scions. But be aware of **Limette No. 3** - Certificated Budwood and **Limette No 5** - Rootstocks for Citrus trees. Keep allways in mind, that spreading of diseases by the use of pollutioned budwood may be desaserous and the usage of the right rootstock could also be worth a consideration, of what scion someone buds on which rootstock, and which goal or aim someone has with it, doing so.

Let's start this Tutorial with T-Budding, and in general what one will need for budding.

Materials for Budding

The following list will help, just to have the right tools at hand.

- ◆ A razor sharp budding knife with a brass bark spade to loosen the bark from the stock
- ◆ A roll of good budding tape, to secure and seal the bud right in place at the stock
- ◆ A water proof pen, to mark the bud
- ◆ A 10% dilution of household bleach, like chlorix for disinfection
- ◆ A pot with clear water to rinse the disinfected knife
- ◆ A clean worktable

These are the tools you need. There is no discussion about the knife, because some professionals use carpet cutters or sterile scalpels from the pharmacists for those purposes, I simply recommend a budding knife, which one can get by his local garden supplier or in a good tools shop.

In plant material you only need:

- ◆ A rootstock, straight upright is preferred (**Picture 1**)
- ◆ A good scion wood, best from certified sources

With all that, you can start budding. For the budwood, it's best for T-Budding to have round twigs, the ones, exhibiting first strains of brown bark stripes are preferred, they should also exhibit strong large buds. Best is to cut budwood fresh, and if possible: Water the plant some hours befor taking the budwood. Because that will ensure a proper bud condition and won't let buds dry out to fast.

Cut away all the leaves. Some people let the leaf stalk attached, but it's not necessary, so you can remove it also, carefully.

In the rootstock, cut away all leaves and thorns around the point, were the bud should be placed, and later were the rootstock is wrapped. Clean the area carefully with some water.

Inverted T-Budding

In Inverted T-Budding the cut in the rootstock remembers to a inverted T. First, dip the knife for a couple of seconds in the disinfection solution and rise in the water befor you use, do so also, befor you cut into the budwood.

As seen in **Picture 2**, you cut straight down the stem thoughly to the bark. At the end, you stop and do a horizontal cut, which the straight downwards cut in the middle of it, so that the cut comes to this inverted T. The horizontal cut do slightly upwards, just to ensure a slight loosening of the bark from the woody parts of the stem. Now unfold the bark spade of the budding knife and carefully peel of the bark flaps. They should not rip, just loosen them and building a small pocket like inset area for the bud. **Picture 3** shows the finished pocket and bark flaps.

Now cut the bud. Carefully cut above one bud, not to deeply, as shown in **Picture 4**. Only a very thin sliver of wood should remain, turn the blade slightly clockwise (if your're right handed, lefthanders should turn the blade anti-clockwise) to bring the blade nearly parallel to the scion and slice the bud of. You do not need to cut of the bud, simply press the bud with your thumb onto the blade, and tear the bud off the twig. See **Picture 5** for the start of this tearing action. Now, flip the teared-off bud over, face down and get the long remaining tail. Here you can pick up the thin sliver of wood and carefully tear it away from the soft bark of the bud slice you've cut. At the point, were it reaches the bud, bend it, and break it off. In **Picture 6** you can see the bud face down with the removed wood.

This bud you now put into the inverted T-cut at the rootstock. Please, do not touch the cut side of the bud shield, because the microorganisms at your fingers won't really permit a good bud take. With the long tail and a little help by the brass spade of the budding knife, one can easily shift the bud into vertical cut on the rootstock upwards, till the flaps hold it right in position and won't let it fall out.

Now, at the horizontal cut, cut away the tail, to align the buds end with the horizontal cut in the rootstock (**Picture 7**).

Get now some wrapping tape. This flexible, but very strong PE-Tape special for budding purposes will now be wrapped around the T-cut, to fix the bud on the rootstock, seal the wound and inhibit a quick bud dry out.

Simply wrap the first round above another, pull and now you have a tight start. Wrap slowly upwards or downwards, and only overlap the wraps only half of the tape width, not more. In **Picture 8** it is shown how the wrapping is done. Place the tape carefully over the bud, and pull the tape tightly to the backside of the rootstock, to press the bud strongly to the wood of the rootstock.

After you have finished, and the whole cut and bud is covered with tape, tightly wrapped around, wrap some rounds at one place, and secure the end with a half hitch and pull it tight. **Picture 9** shows the finished wrapping.

Chip Budding

Chip budding is comparable with T-Budding, but one can also use more angular budwood from younger bud sticks, or bud, if the bark does not really slipping, making the pocket for the T-Bud insertion difficult to do.

So again all starts with the rootstock and the disinfection of the knife. **Picture 10** shows the first cut, a horizontal notching, angular cut into the woody parts of the plant, followed by a downward second cut to the horizontal cut, as **Picture 11** shows. This will remove a sliver of wood, as **Picture 12** shows. Do not touch the open wound with your finger.

Now, do the same two cuts, after disinfection of the blade and rinsing in water, on the scionwood. **Picture 13** shows again, how the sliver of bud wood is taken, and **Picture 14** shows the, from the scion wood removed, sliver little better. Press now the bud to the blade, get the blade to the cut of the rootstock and slide the bud downwards the blade into the notch at the base of the rootstock cut. **Picture 15** shows the correct placed scion bud.

Now again take some budding tape, do the first wrap above the bud, pull tight to ensure the tape is secured on the rootstock stem, and now wrap downwards. This will press the bud into the notch, and with the pull tight to the rear of the rootstock stem, it will secure and press the bud tightly to the rootstock wood. Again, overlap only a half of the tapes width, to ensure a tight and good wrapping. After wrapping the whole bud and cutted surface, do again some rounds with the tape, and secure the end of the tape with a half hitch. Finished Chip Budding you can see in **Picture 16**.

After Budding

After Budding, unwrap the bud after four, up to six weeks. Black or otherways dried out buds are removed and the wound is sealed with a rubber like innatural bark.

All taken buds remain green and healthy, and also show in most cases well new growth of cambial tissue, which can be seen in **Picture 20**. The best sign of a completely taken bud.

After the bud take, one must force the bud, force it to grow. This can be done by bending, topping or breaking. Bending means to bend the top of the rootstock down to the ground. Topping is easily done by cutting of the top of the rootstock. The first methode, bending, is in my opinion a to soft way, topping is in my opinion a to hard methode. So I use breaking. Above the taken bud one must do a deep cut about one half through the rootstock stem, and breaking the rest of the stem away and downwards from the bud. This can also be seen in **Picture 20**, were this bud forcing methode is used.

Use a water-proof marker and mark onto the budding tape date and variety you have budded, to allways remeber you what you've done and to remember the right time for unwrapping.

Comments:

Well, at least only one comment! Do not expect that it will work from the beginning. Usually one will need much of experience till a good budding procedure will work.

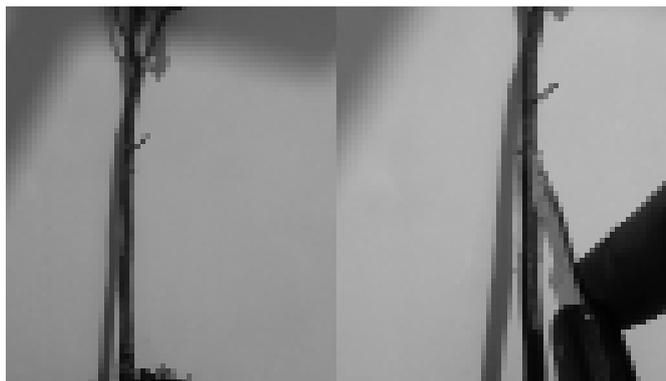
Simply many failures will occur, but also with experience more and more effective the budding will get, and more successfully bud takes will occur. So practicse will be the aim, to get a successfull budder!

Note:

This publication can be download from the web, but only with black and white pictures of a 120 dpi quality. For getting a 300 dpi quality with color pictures, please contact the autor. Because the web one will only be good for viewing on a computer monitor, but for a good printing the better solution and color pictures are recommended.

Difference in both issues comes only by the color pictures in full solution.

Inverted T-Budding

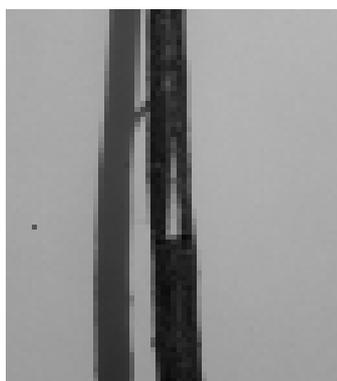


Picture 1: Rootstock

Picture 2: Vertical Cut

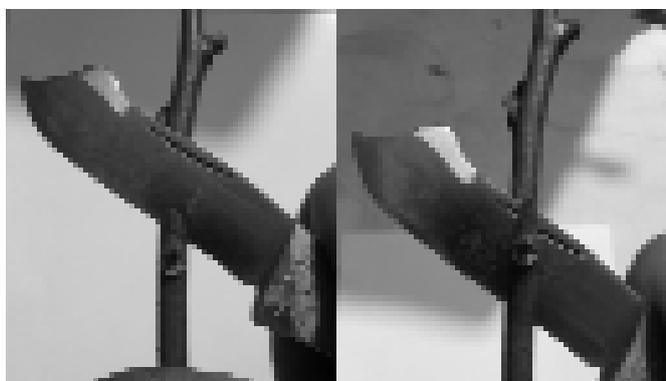
Picture 1:
Everything starts with a good straight rootstock trunk. Leafless, smooth and clean, ready to bud. For beginners it might be somewhat more easy to unpot the rootstock, so handling is little easier.

Picture 2:
Now begin with the first cut. Vertical downwards through the bark, and then set the second, horizontal cut just below this cut, to get a cut in shape of an inverted T



Picture3: finished Pocket

Picture 3:
With the brass spade of the budding knife, carefully loose the bark from the wood of the rootstock and open both rind flaps to a pocket like insertion area. Take care, that at the downward pointing ends of the sideways bark flaps the opening is wide enough, to ensure good insertion of the bud, as this would now the next step. Try not to damage the tender bark flaps, they should not rip, fold or get otherwise damaged. Also be carefull not to damage the tender cambial tissue at rind and woody parts of the rootstock. Best is, if the bark loosens freely. A budder calls this: "the bark is slipping"

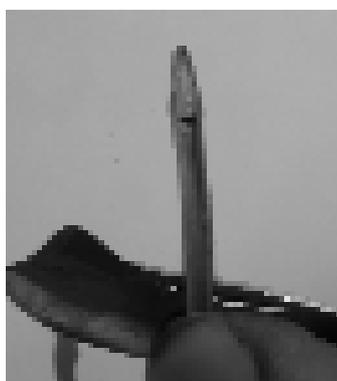


Picture 4: Startig scion cut

Picture 5: End Bud cut

Picture 4:
Now cut the scion. Start right above the bud and cut not to deeply into the wood, rotate the knife while cutting, so align the blade nearly parallel to the scion and pull it softly downwards.

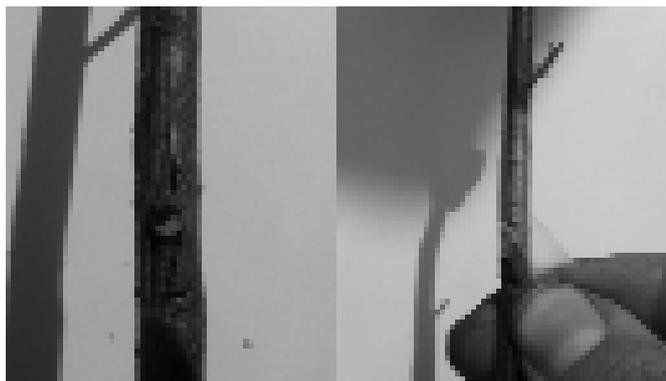
Picture 5:
After finished the cut, rotate the knife back to get the bud on the knife blade, angle the knife slightly to lift the bud. Now you can press it with the thumb to the blade and tear it of from the budstick.



Picture 6: Teared of wood sliver below the bud

Picture 6:
After tearing-off the bud, a sliver of wood remains in the taken bud. So flip the bud face down. Carefully loose the sliver of wood from the tender bark of the teared-off shield, beginning at the 'tail'. Now pull the sliver of wood carefully upwards, to remove it carefully from the buds tender outside tissue. Just at the bud, it is stronger adhered, and buds with thorns won't be able to completely remove the woody parts of the cut bud shield. So carefully do a cut with the knife into the sliver of wood away from the bud and break the sliver of wood to remove it. Now only a little rest will remain covering only the bud area.

Inverted T-Budding



Picture 7: Inserted bud

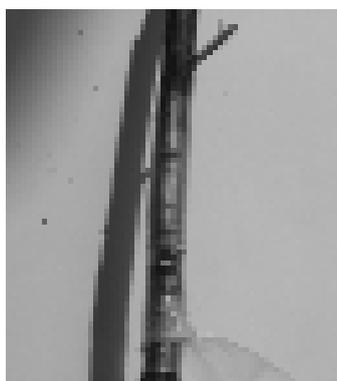
Picture 8: Wrapping bud

Picture 7:

Flip the bud, and carefully insert it into the pocket you made in Picture 3. Carefully push the bud upwards the vertical cut you made, just to ensure the the whole bud is covered by the both bark flaps. Now cut the remaining tail off, just align with the horizontal cut you made in the rootstock.

Picture 8:

Now wrap the bud with budding tape. Secure the tape atop or below of the bud. Slowly wrap downwards or upwards. Lay the tape carefully over the inserted bud, and then pull to the rear of the rootstock, so press the bud tight to the rootstock.



Picture 9: Finished, wrapped T-Bud

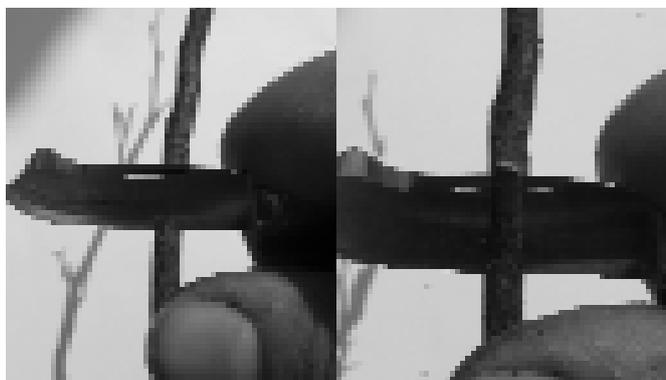
Picture 9:

As you can see, the bud is entirely wrapped with budding tape. Ensure, that all wrapping has a strong and tight pull to the rear of the rootstock, to press the bud very strongly to the wood of the rootstock.

At the end of the wrapping, so some tight rounds more to secure the wrapping you made. Do a half hitch so secure the wrapping. Let a round wide, to build a sling. Now insert the end of the budding tape to the sling and pull, so the sling will close and secure the end, that's the half hitch.

Now remark on the hanging end of the budding tape the variety and the date of budding, because to ensure not to unwrap to early and always remeber, what variety you have budded.

Chip Budding



Picture 10: notched cut

Picture 11: downward cut

Picture 10:

For chip budding start at the rootstock with a horizontal notching cut into the wood of the rootstock. Carefully, because to easily one will cut the whole rootstock through.

Have a good angle, just to create a well notch, to hold the chip later.

Picture 11:

Now, above the first cut start with a straight downward cut throught the woody surface, to create a splinter. Secure it with the thumb and remove it togehter with the knife



Picture 12: Removed wood sliver

Picture 12:

Now you have removed the chip of wood, getting a clean cut with a smooth surface. At the bottom end of the cut you have a notch, were you want so set in the budwood chip and secure it. It should slightly be tucked in there, to ensure it is kept in position. Do not touch the open surface, and avoid any dirt coming in there.



Picture 13: Cutting the scion sliver

Picture 14: Removed chip

Picture 13:

Now, as you have done at the rootstock, do the same at the budstick. First do the notching horizontal cut, than the smooth downwards second cut, angle the blade to loosen the chip. Secure it with your thumb to the knife blade and remove it.

Picture 14:

The ready to use budding chip, the wedged end at the buds bottom should now tuck into the notch of the rootstock cut, and hold the bud in position.



Picture 15: Inserted chip in the rootstock cut

Picture 15:

The inserted chip. Remark, how the notch holds the wedged bottom end of the budwood chip, and that both sides wonderful align the cutted sides of the rootstock cut, bringing the cambial tissue to a very good alignment.

The budwood chip should, at best fit properly into the rootstock cut. This will need some experience...



Picture 16: Wrapped chip bud

Picture 16:

Now, wrap the bud, start above the bud. Secure the tape with a round, pull tight and wrap carefully. As mentioned above, lay the tape carefully over the inserted bud and pull at the rear of the rootstock, to ensure the bud pressed tightly to the wood of the rootstock. Again, overlap only half of the width of the budding tape. After wrapping secure the end with a half hitch and remark date and variety to the end of the tape.



Picture 20: Taken bud, forced by breaking to top away from the bud

Picture 20:

A taken and forced bud.

Remark the cambial tissue around and above the bud, being the best visible sign that the bud has been taken.

Force the bud, here with breaking. A half cut through the rootstock above the bud was done. Now the rootstock top was broken off, away from the bud.

The bud just below the breaking zone should now sprout and build up a new stem and crown.