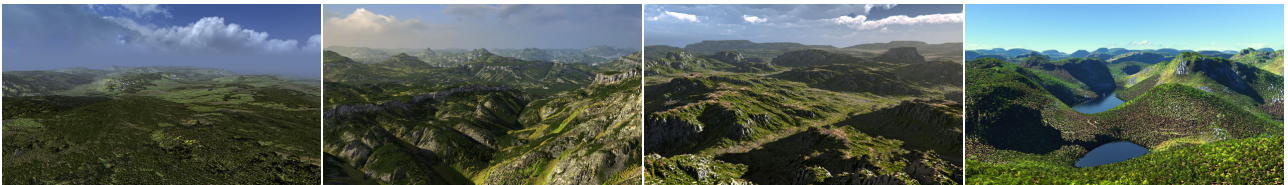


Grass Patch made from a Bryce Tree

Bryce trees are very versatile objects. Wood and leaves are made from metaballs and can be deformed into many ways. Different grass patches can be made from a Bryce tree by using only the foliage.

Introduction

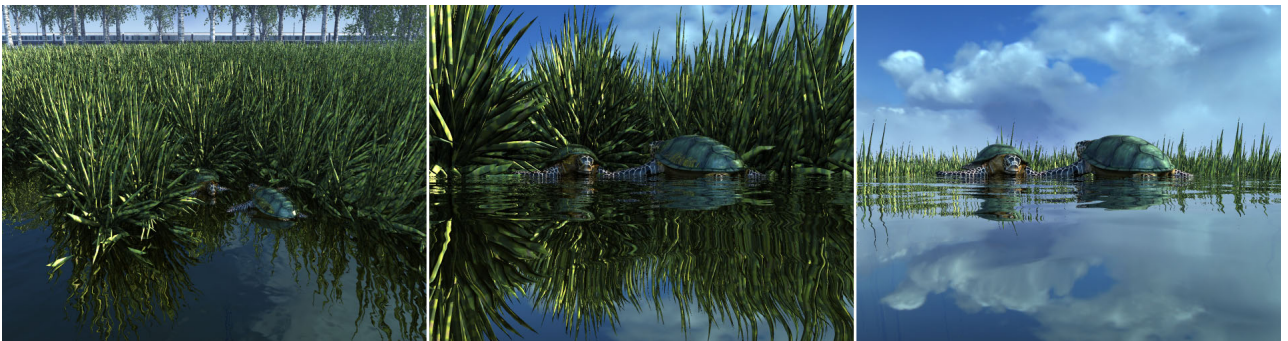
For a broad view of a landscape as shown in the four examples below, the material applied to the terrain is often enough to indicate vegetation, grass, bushes, small trees even. As the camera moves nearer to the ground, the lack of vegetation objects becomes obvious.



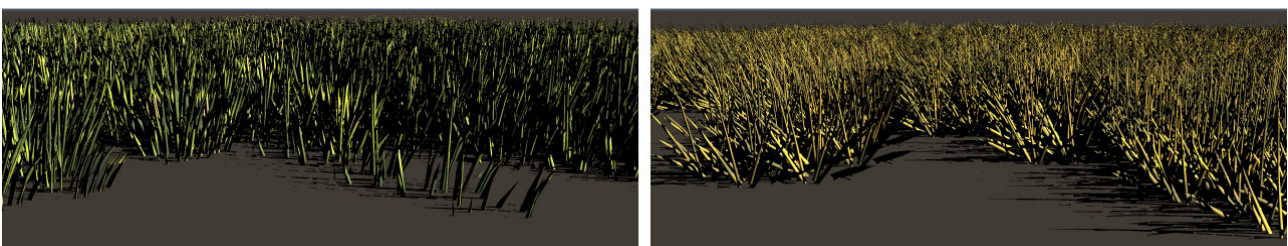
Grass blades can be made as objects with a dedicated program like Bantam 3D Grass for instance. There are also readymade small grass bushels that come with Bryce that can be used and instanced to make a grass carpet.

Using a Tree

A tree can also be used to make quite a big patch of grass in one go and if it does not cover enough ground, it can be instanced. The examples below use one single tree; the left render is a bit of an overview, the centre one has the camera very near to the water surface and is nearer to the turtles. If the grass has grown too high, the tree can be lowered as was done from the centre to the right render (enlarge in your viewer).



The material for the wood — trunk and branches — is just made fully transparent, it is not used and buried in the ground. Above it is under the water and depending on the viewing angle, the wood could be seen if it were not transparent.



I know of two different approaches that result in usable grass patches, one brought forward by Slepalex (left, above and below) and the other by David Brinnen (right, above and below).



There are some differences between the settings the two “inventors” came up with. It inspired me to experiment and investigate this topic. None is better, both can give great results. All controls change the appearance and both examples show good settings to start from.

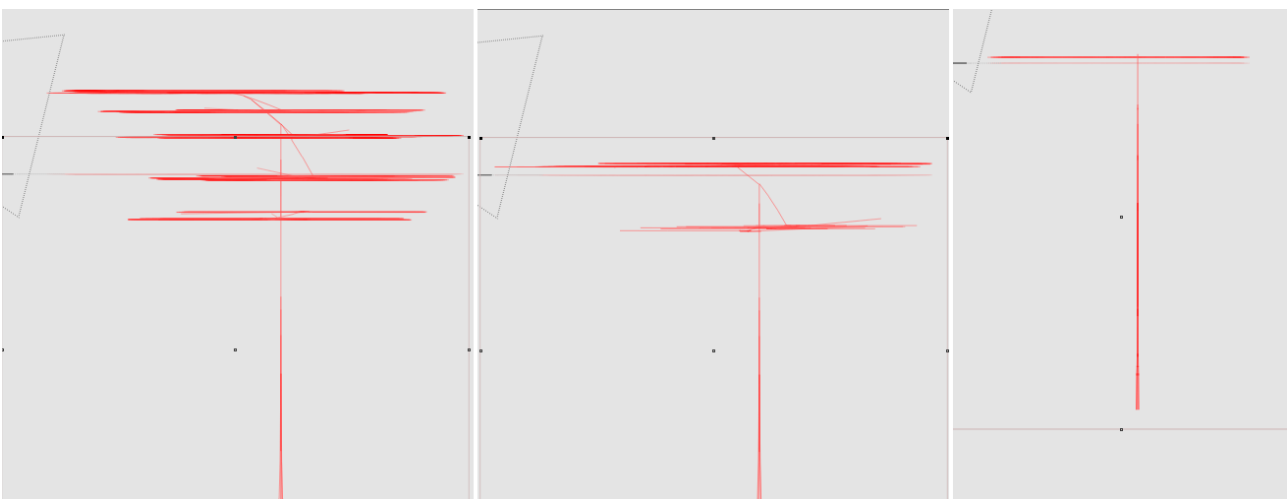
Tree

The **Shape** used makes a difference and you can spending an afternoon with changing the shape and see what happens. Some shapes are useful, some are less suitable. Using the *Default* shape is a good choice. **Gravity** must be 0 because we want a horizontal patch of grass. **Randomness** should also be kept at 0 to be in control of what is going on. Besides, if the tree is saved with *Randomness* at any other value, when it is loaded it will look different.

If the grass patch looks good to you, saving the tree in the *Objects Library* would be the better choice because the materials applied are also saved which is only the case for the wood if saved as a tree; the leaf material will be assigned randomly when the saved tree is loaded.

Branch / Trunk

This is what I call the wood here. When you start adjusting the values, watch the preview and check the result in the render window, side view. Strive for only one horizontal line. The picture below at left shows the tree with six levels, the centre one with two and the right one with only one.



The centre shows the tree with the TE settings above at left, the right one with the TE settings at right. All lower levels can be buried in the ground but the tree takes more memory the more levels there are. The one with two is no problem. In fact, the tree can be turned upside down and moved up in such a way that the smaller lower patch makes the grass.

Distribution changes the size of the patch; values between 0 and about 10 can be used.

Branches Per Segment should be left at 1 / 1, we only need one for the grass patch.

Segments controls the density of the grass with 20 / 20 resulting at the highest density but using 10/20 gives some variation within the patch and can look more natural but the tree may also lose its flatness at the top.

Branch Start Angle must be 180 degrees to make the branches horizontal.

Branch End Angle should be also 180 degrees but if *Trunk Thickness* and *Branch Thickness* are both at minimum, it can be 0 degrees.

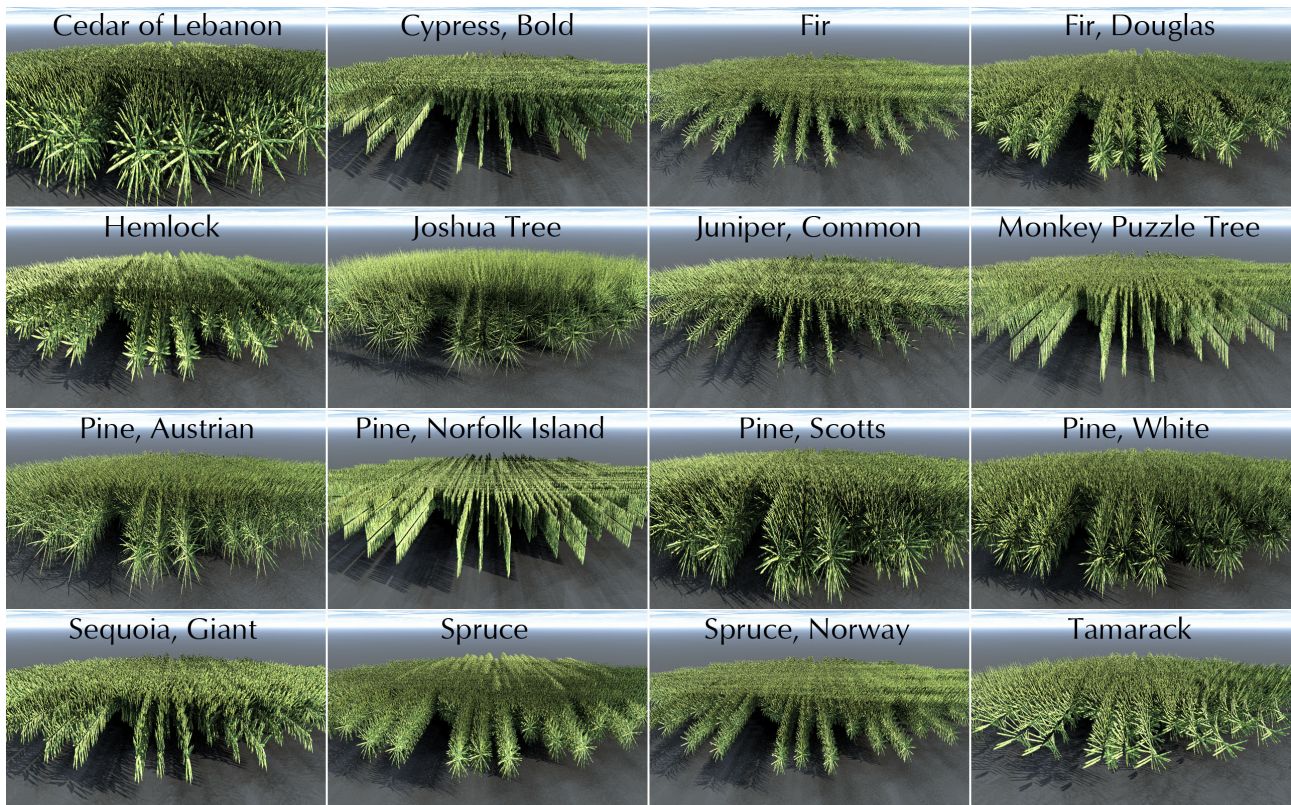
Trunk Thickness can be at the minimum 1 / 1, if a higher values are used, more layers appear (see above).

Branch Thickness changes the form of the patch by compressing the layers. If *Trunk Thickness* is kept at the minimum, *Branch Thickness* can be set to 0 / 0 and even *Branch End Angle* at 0 degrees. These settings all influence each other.

Texture use *Material*, set it to default, *Diffusion* to 0 and *Transparency* to 100. As already mentioned, we do not need the wood.

Foliage

This is what makes the grass. Obviously, we need a leaf in the form of a needle as a conifer has. For the **Shape**, the following types can be used (enlarge in your viewer):



The needles are a bit different for all 16 conifers available for the *Foliage Shape*; some are a bit thicker, others a bit thinner, a bit longer, a bit shorter, a bit straighter, a bit more bent.

All renders use the same tree settings based on the one on page 2 above left but *Branch End Angle* 0, *Trunk Thickness* 1 / 1 and *Branch Thickness* 0 / 0. The *Foliage Scale* is 8 and the *Number of Leaves* 4. The tree crown is well above the ground plane so the upper and lower side of the branch or twig is visible.

Scale is mostly the length and thickness of the needle but also changes the size of the grass patch somewhat.

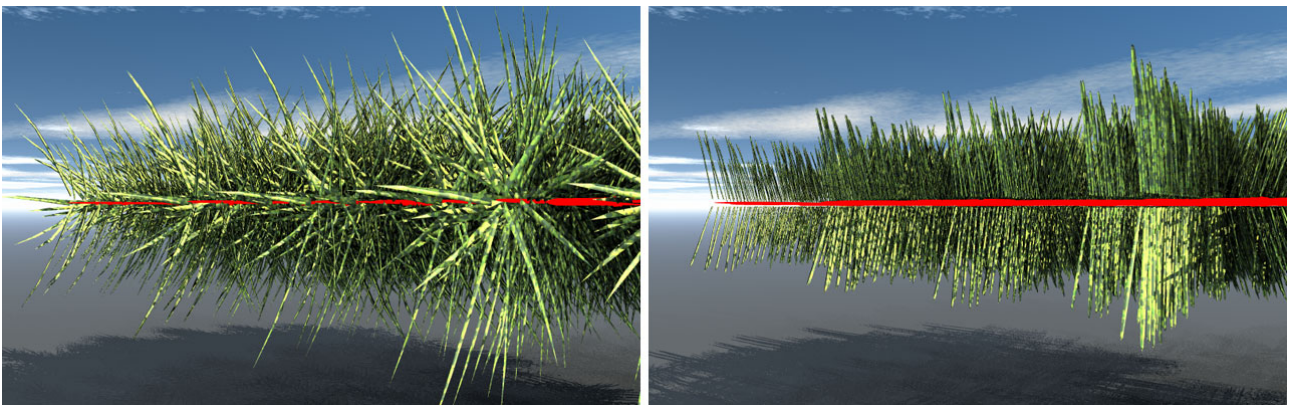
Number of Leaves mainly determines the size of the grass patch but also the size of the needles to some extent.

Distribution is how the leaves are arranged on a twig and obviously *Coniferous* is the only sensible choice.

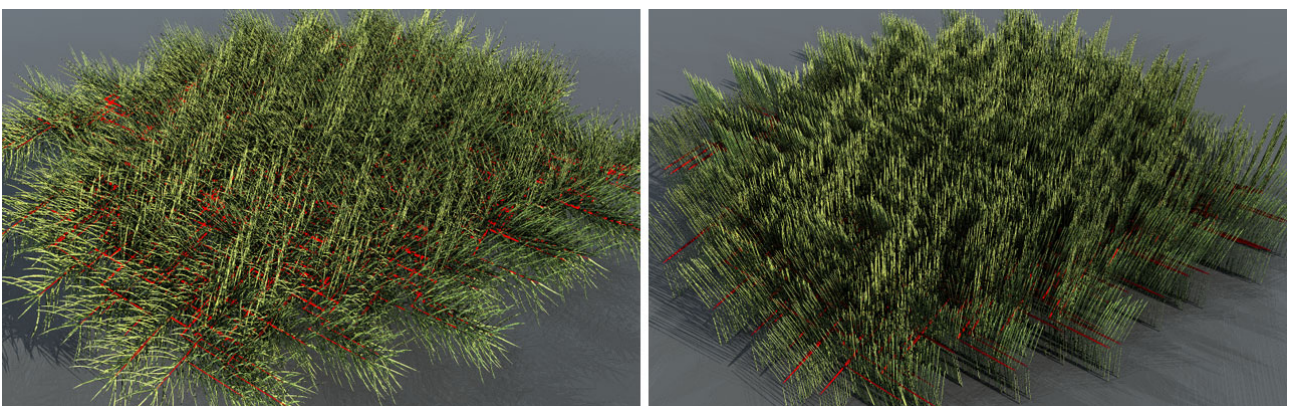
Texture use *Material* and in the Mat Lab give it some grassy material. You might want to give the grass some translucency and you are welcome to do so if a lengthy holiday is planned so the render can take its time. Honestly, using some transparency as translucency on the grass can really take very long to render. Better add some fill light or IBL either without or with reduced shadow intensity but do keep *Sun/Moon Shadows Intensity* at 100. A parallel light with infinite width below the grass shining upward can also help. Also using a wee bit of *Ambient* and *Ambience* is a possibility but seldom the ideal choice.

Positioning

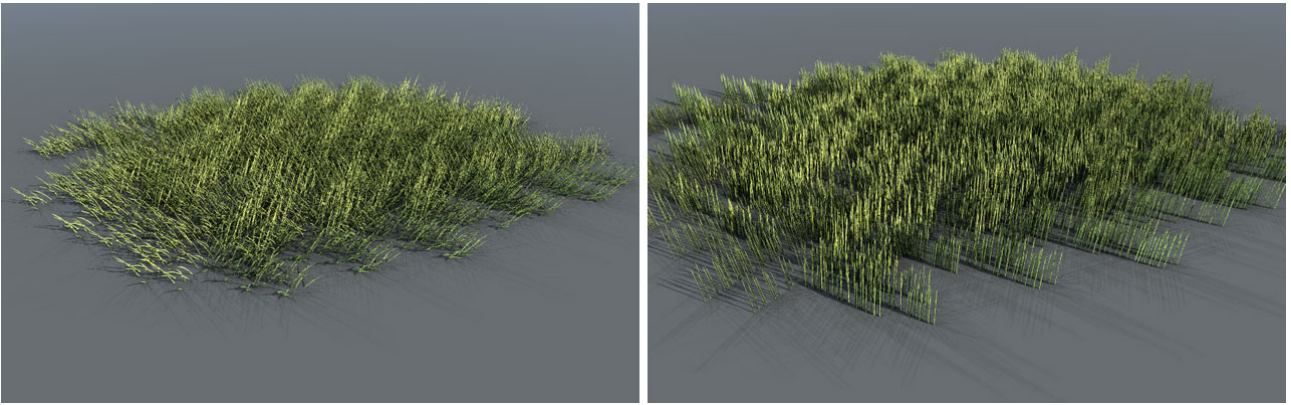
Easy, just move the tree down until only the grass is visible and covers the ground as desired. The deeper the tree is set, the less high the grass is. The needles are not only arranged on top of the twig but can also go around it and there can be bushels at the end of the twig, too.



Left *Pine, Austria*, right *Monkey Puzzle Tree*. The wood has fully red *Diffuse* and *Ambient* to make it visible. The pine has the needles all around the twig and a bushel at the end; the *Araucaria araucana* (Monkey Puzzle Tree) has the needles only up and down and it looks almost mirrored. The tree has to be lowered until the twig or branch is below the ground, otherwise it may look a bit funny.



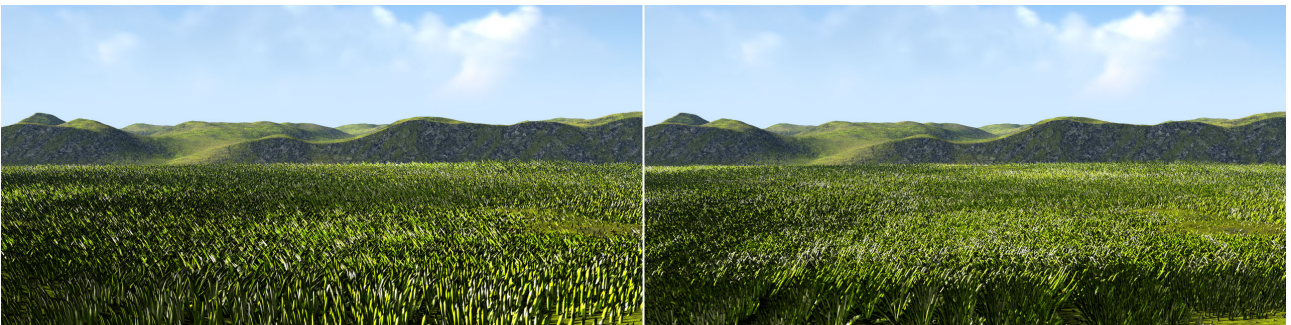
However, if looked more from above, this is a less severe issue. The same patches as above with still the red twigs look less offensive except for the edges. Properly buried as shown below is much better.



Example

Here are two example renders using the same TE settings as shown on page 2 left but *Branch End Angle* at 0, *Trunk Thickness* 1 / 1 and *Branch Thickness* 0 / 0. There is one tree six times manually instanced; that makes seven trees. The trees have the same size but their vertical position differs by 3 Bryce Units (BU).

Below the trees is a *Square Parallel Light* with *Infinite Width* looking up, green (R/G/B 209/255/145) *Diffuse* 3, *Falloff* None and *Shadow Casting* disabled and the terrain excluded. The scene is lit by the sun and an HDRI for the ambient light.



Foliage at left: *Cedar of Lebanon*; *Scale* 10 and *Number of Leaves* 4. At right: *Spruce Norway*, *Scale* 15 and *Number of Leaves* 5. The tree and instances of it had to be moved up by 13 BU.

Depending on the tree shape and how the edges look, it may have to be rotated and/or an additional tree or instance added to cover unfortunate edges, as is the case above at right.

Conclusion

Trees can be used to create grass patches for a meadow but are perhaps a bit less suited for lawns. If the ground is rather uneven, there will be parts without grass blades because they are buried below the ground. A smaller patch may have to be added with the tree a bit higher. It can be a bit tricky because differently high patches can look unnatural. In such a case, many instances of a single grass blade or small bushels may be the better choice. Also a tree grass patch near a precipice can be challenging to position because of the edges.

Note

For Bantam 3D Grass, see https://horo.ch/raytracing/tools/b3dg_en.html.