CMPM 163 Homework 1 Question D

Pictured above is smoldering grass left behind after Spyro breathes fire on it in the Spyro Reignited Trilogy.

This effect has three parts. First Spyro breathes fire out of his mouth, then the grass becomes a much darker shade of green, the blades are depressed down, and glowing embers seem to move over the grass blades. Finally, the effect collapses inward and healthy grass returns.

While I could not find any information about how this particular effect is achieved, I have looked at similar effects and believe I know how it is done:

1) The fire breath is likely a particle effect with some variation of emission on it in order to make it glow like fire. The particles start moving quickly away from Spyro's mouth and then proceed to slow down and spread out towards the end before fading away.
2) The effect on the grass is achieved using both vertex and fragment shaders. The vertex shader is used to flatten the grass, collapsing its vertical coordinates so that it is noticeably lower than the surrounding grass. The first pass of the fragment makes the grass a much darker greyish green as though it had been burned by smoke. The second pass adds the ember effect probably using Perlin noise to determine where the embers are placed, and recalculated each frame to move smoothly.

3) Finally, the shader collapses in a circle back to its origin point. I am unsure exactly how this is achieved as it likely depends on how the grass was implemented in the game. Assuming the grass is a single object then the shader need only know its radius in order to determine which parts were affected and slowly bring it back to zero. It is worth noting that the effect is always composed of circles overlaid on top of one another in order to create the effect as a streak over the landscape. All of these circles also clearly have the same starting radius.