

Risk Assessment Worksheet

		Our Project: “Thermoplant: Planting heat resistance, one rhizobacterium at a time”
Usability of technology		
	Ease of use	Rhizobacteria are not as easy to use model organisms as E. coli, however there is enough protocols out there to help even inexperienced users get the hang of it
	Rate of development	Genetically modifying plant bacteria is a common practice, but genetically modifying rhizobacteria is not as common of a process
	Barriers to use	RNA thermometers are finicky, so getting the exact change at a certain temperature can be hard to guarantee
	Synergy with other technologies	Our rhizobacteria interact with the plants on the root level allowing for other technologies to interact with the plant in different parts
Usability as a weapon		
	Production and delivery	RNA thermometer sequences are quite short and our root bacteria are being used as vessels already to deliver our targeted enzymes
	Scope of damage	Our genetically engineered bacteria will already have a higher metabolic burden so adding on more components will decrease its effectiveness significantly
	Predictability of results	The thermosensor is a novel component, so its predictability is not as high. The enzymes we are producing are naturally components so the effects on the plant are known
Requirements of actors		
	Access to expertise	We are using a very well known root bacteria so manipulation of that does not need high level expertise, our RNA thermometers are more niche knowledge but there is literature
	Access to resources	Needs access to normal biological laboratories and root bacteria on hand
	Organizational footprint requirements	Limited if any, our project is on the simpler side
Potential for mitigation		
	Deterrence and prevention capabilities	Our root bacteria are already naturally found in the rhizosphere, so will be hard to separate in soil
	Capability to recognize an attack	Depends on how our bacteria are being used, but when assessing root damage fungi and other pathogens are usually investigated before symbiotic root bacteria
	Attribution capabilities	Our RNA thermometers are novel to our project, so those would lead directly to us.
	Consequence management capabilities	Our bacteria are already heavily burdened by excess production of natural enzymes so there is limited damage that it can cause. But we do admit that if the bacteria leave our intended area of use it could negatively impact the environment with unwanted growth.