Knepp Ragwort Podcast

A conversation between Isabella Tree and Professor Mick Crawley

Note: Ragwort is not actually illegal. The Weeds Act 1959 only provides for control notices , it does not prohibit growing it. In the podcast, the word "illegal" is used ironically, reflecting a common myth both speakers know to be false. Prof. Crawley briefly confirms the true position by saying "no".

ISABELLA TREE: Hello and welcome to the Knepp Wild podcast with me, Isabella Tree, author, conservationist, and co-owner of Knepp Rewilding Project. This month, we're discussing a plant that is probably the most controversial native wild plant in the British Isles. It's been a spectacular summer for common ragwort. You may have seen it erupting in fields near you, on roadside verges, in urban parks, anywhere there's a tiny piece of space for it. People either love it or they absolutely hate it and want it erased from the face of the planet. So to get to the bottom of these high and tense ragwort passions and to try and nail some of the facts about it, I'm standing in acres and acres of ragwort in the middle of the rewilding project at Knepp with our old friend Mick Crawley, emeritus professor of plant ecology at Imperial College London, who probably knows more about ragwort than any person on this planet. So lovely to see you, Mick. It's great to be here, bathed in the summer glow of this incredible plant. Perhaps you can begin by describing what we're seeing here.

PROF. CRAWLEY: What we're seeing here is one of three stages that we need to separate about ragwort. What we're looking at here at the flowering stems and there are about I reckon four to the square meters. So that's a that's a high population but it's not what we would call as a peak population. That would be 10 or more flowering stems per meter unbroken in a monoculture. So just before we get into the very very nitty-gritty, can we just describe what the plant looks like for those of us who who may not be familiar with ragwort and also just to say that we have got photographs of ragwort on our latest ragwort blog on the Knepp.co.uk website. So if anyone wants to see some images of this plant, go straight to the website and look at the blog. But Nick, yeah, so so describe the actual physical plant and then if you would, what's going on with its ecology? Sure. So most of the plants are about chest high. Possibly a third of them are about knee high. So it's it's quite a big flowering plant. At this time of year, as it's starting to set seed, it's obvious that it's a member of the daisy family. So it's got yellow daisy flowers in a flat topped flower head. And the seeds turn to fluff. Technically a pappus, dirty white pappus at this time of year. And then the seeds blow away. So these are the ones that people think of as ragwort. when they see this, that's what they're calling ragwort. But there are two other really crucial bits of the ragwort story. The first one are the rosettes. Now, these are on at ground level, no higher than your shoes, and they're next year's flowering plants. So, they came probably from seed last year.

ISABELLA TREE: So, we can see a few, can we around here?

PROF. CRAWLEY: That's right. Absolutely. They're they're about 20 cm wide. They're typical daisy flower nondescript looking leaves. And of course they're the place where the alkaloids are stored, the poisons that defend the plant against its herbivores. We'll talk about that in detail later on. So the the rosettes above ground in year one and the flowering plants are above ground in year two. The thing that we tend to forget because it's out of sight is the seed bank. So when the seeds disperse, they fall on the ground and with any luck at all, they'll get into the soil. And once they're there, they could live at least 25 years, we think, from experimental work.

ISABELLA TREE: Wow.

PROF. CRAWLEY: Most of them probably are dead by 5 years, but nevertheless, that's quite a long time to have a seed bank that could run to tens of thousands per square meter. So, we're looking at four grownup plants here per square meter. That could be 10,000 seeds per square meter underneath that. So, that's why it's hard to get rid of.

ISABELLA TREE: So before we go into the why do people hate this plant perhaps we should describe the benefits of it and why particularly I mean obviously here at Knepp we love it and we haven't done anything to try and eradicate it but its benefits for wildlife are extraordinary aren't they?

ISABELLA TREE: They are well there's two ways of of enjoying ragwort if you're an insect. One is if you eat it, there are two important insects who eat it and about 20 less important ones that live on it have to live on it but don't have much impact on the growth or the seed production of it. But probably the widest benefit is from the flowers and the nectar and pollen they provide. There are dozens of species of all sorts of insects and other invertebrates indeed that that basically rely on the nectar produced by ragwort because of the time of year.

ISABELLA TREE: Seven I've read somewhere.

PROF. CRAWLEY: There you go. There you go. But it's a time of year when there isn't very much else to do if you're a nectar feeding adult insect.

ISABELLA TREE: So one of the benefits in fact is is its late flowering. So it goes on I mean we've we've had them flowering here I think sometimes until late October or even November.

PROF. CRAWLEY: Yeah.

ISABELLA TREE: And also this amazing acid yellow color of its daisies is visible to nightflying moths which are obviously some of our best pollinators ever.

Yeah. So there we are with this wonderful, very beneficial native flowering plant for wildlife in the UK. And every year at Knepp, we have to brace ourselves when we see it returning in force like this for our our hate mailbag. People, you know, accusing us of being irresponsible, you know, deliberately trying to to kill animals. What is going on here?

PROF. CRAWLEY:I think no plant has more fake news about it than ragwort does. There's a small number of people out there who are absolutely passionately wrong about ragwort. The big issue is horses because it's true that you could kill a horse by feeding it for example hay that contained a lot of ragwort. You would kill it through liver damage. So it can do harm. The question is does it do harm? We know it can do as cuz actually the bulk of British wildflowers are toxic to most things, aren't they? So the question is what's going on here with these people who say that ragwort is is a plague for horses. The truth is there's no substantial data on causes of mortality in British horses. There's no database that you can look up that says these are the horses that died from ragwort poisoning and they amount to 25% of all horse deaths for example. There's no such data like that at all. And the likelihood is that the percentage of all horse deaths that can be attributed to ragwort eating is is as close to zero as makes no difference. So the horror stories about horses in ragwort are basically fake news. Now why people want to do that is a mystery. And if you look on the website when there's a controversy about ragwort you'll find far more people replying to that fake news and saying this is nonsense than there are people who are purveying it. So it's it's not it's not a universally held view. So I wonder whether one of the the sort of origins of this kind of whole big myth about ragwort is something to do with the injurious weeds act where it was identified I think along with creeping thistle and spear thistle and docks and one other I can't remember as being an injurious weed that we had to get rid of for the purposes of farming and that has kind of settled I think into people's heads like it is this is a really really poisonous plant that should not be accepted anywhere.

PROF. CRAWLEY: That's right. It's an illegal plant.

ISABELLA TREE: It's an illegal plant. Yes. And as a land owner, people say that you are legally bound to get rid of it wherever it exists.

PROF. CRAWLEY: **[**Here he makes it clear the plant is not illegal] True. No. And the government guidelines themselves say you do not pull up this plant anywhere in nature. This is a really beneficial plant. So there's there's something very deep going on in our kind of subconscious that makes some people react like a you know red rag to a ball about this plant.

ISABELLA TREE: It's extraordinary that a native wild plant could be illegal.

PROF. CRAWLEY: Yeah.

ISABELLA TREE: In any country in the world. I mean of course ragwort is a terrible invasive nuisance in other parts of the world where our farmers, our immigrant farmers took it because they took bags of seed from their pastures permitted with all the pasture weeds you could possibly imagine. So places like California, New Zealand, Australia, South Africa have terrible problems with ragwort and spend literally fortunes trying to get rid of it. And the wonderful truth is they make no difference at all. So all those dollars spent have absolutely no effect. And I'll explain why in a minute.

ISABELLA TREE: So just to be absolutely clear, the kind of animals that we have free roaming around Knepp, so we have cattle, we have horses, do not eat the living plant in the wild. Um, they completely ignore it. I mean, we can see it all standing here and then the very closely grazed grass underneath them. I mean, they're studiously avoiding it. I I guess it's not called mare's fart and stinking willy for nothing in in lots of the sort of, you know, sort of local dialects of of this plant. So, it's only dangerous to animals if it's cut in hay or silage where the animal then can't smell it. It can't taste the very stringent taste of it. So it can't recognize it basically.

PROF. CRAWLEY: Absolutely. I mean it we've got to admit that if you intend to cut your field for hay, it's absolutely essential that you pull the ragwort up before you cut the crop. Otherwise, it'll dry into the hay and the animals that are eating it won't recognize it. But that's a very small percentage of all places that ragwort grows. What we've got to know is what is it that kills a ragwort? So people do all sorts of things because it's illegal. They cut their heads off before it plows, for example, or they go around painstakingly pulling it all up and so forth, spending huge amounts of effort, if not money, doing it. And the ironic thing is that both of those pursuits, cutting the flowers off and pulling the plants up, actually increase plant numbers.

ISABELLA TREE: They're totally the wrong thing.

PROF. CRAWLEY: Exactly the opposite of what you should be doing. It's a classic piece of what ecologists call a counterintuitive result. It's not what you would think at first thought. The truth is much harder for people who don't understand the population dynamics of ragwort is that the only way to kill it for sure is to let it ripen its seeds and disperse them. Because if it does that, it takes all of the reserves from its rootstock, takes them up the stem to the flowerhead and puts them into the seeds and then throws them to the winds.Then the plant will die.

ISABELLA TREE: Gosh, that is very counterintuitive, isn't it? We get criticized the whole time for for having ragwort at Knepp and people in gardens 10 miles away saying you're responsible for the ragwort in my garden. The seeds have blown on the wind and and arrived here. But that's that's not how it works.

PROF. CRAWLEY: Again, this is this is somewhat counterintuitive. If you do an experiment, you go out at this time of year and you gather ripe ragworth seed and then in some parts of the grass and you sow extra seeds and in other parts you don't and then you go back next year and say where are there more ragwort plants? The answer is it makes no difference. That's exactly the same number of ragwort plants where you sowed the seeds and where you didn't. So an ecologist would say recruitment is not seed limited. Recruitment in ragwort is limited by other things and and we'll come on to what they might be in a minute. But let's just go back to the two things that people do. So cutting the flowerheads off before they set seed reduces the death rate because now the plant thinks, "Oh, I haven't got any seeds to fill. So I'm going to keep those reserves underground and next year I'm going to regrow again. Instead of being a biennial plant, I'm going to become a perennial plant." So you're reducing the death rate by cutting off the seed heads and that's not what biological control is supposed to do. Likewise, if you actually pull the ragwort plant up, it makes you feel good because you've got rid of the whole plant, but left in the soil are at least four or five broken roots, each one of which will produce a rosette next year. So you've multiplied the population by four or five instead of reducing it. So, you see what I mean? A lot of this is counterintuitive and that's why people don't understand why letting the plant set seed and disperse it seeds is not the horror story that you might think because those seeds are very very unlikely to make ragwort plants in future.

So just explain that. Why is it more a plant that comes from the seed bank from the the rosettes on the ground than it is from the seed dispersal in the wind? So, it's a it's a grassland plant with small seeds. And if you put a small seed into a well-managed grassland with plenty of grass in it and it starts to germinate, it's germinating in deep shade and the seed is so small that that seed will kill it almost certainly. So, the seeds that fall into grass and are going to die if they try to germinate. The only chance the ragwort has of long-term future is to get into the soil and plan on staying there for for years or decades. Of course, you do get recruitment from seed, but not in an intact grassland. Something has to have happened. The jargon for it is there has to be a disturbance. Soil disturbance regime is what ecologists call it. If you, for example, cultivated this grassland with a rotivator, and sowed ragwort seeds in it, you would get wall-to-wall ragwort plants guaranteed.: Of course, there are natural equivalents in ecosystems of rotivation. So pig rooting for example is a classic example or rabbit scraping or the heavy hoof prints of a of a longhorn cow. I

ISABELLA TREE: So everything we have here essentially

PROF. CRAWLEY: Indeed the disturbance regime at Knepp is very very good for the recruitment of ragwort and we're witnessing that this year. Let me just tell you briefly a story about it isn't necessarily a big year everywhere and why not. So where I work in Silwood Park in Berkshire, we study ragwort have done for 40 odd years and we haven't had any ragwort for the last 5 years at allincluding this year. There are no ragworts and so this year, Nnow why is that? It's because rabbit hemorrhagic virus eliminated our rabbit population about 10 years ago. So we haven't got pigs and horses and cattle to do our soil disturbance for us. We rely on rabbits to do it for us. And when they're gone, we don't have any soil disturbance in the grasslands. So none of the ragwort seeds falling onto our Silwood grasslands have produced any rosettes and hence no flowering plants for for six years now.

ISABELLA TREE: So when people are seeing the ragwort popping up, instead of kind of looking across the neighbor's fence to somewhere else that they've come from, it's basically it's here. It's where I'm standing now. It's in my garden in the seedbank. That's where it's come from. And some little scratching of a rabbit or a mouse or bit of disturbance I may have been doing in my garden has caused it to allow to pop up.

PROF. CRAWLEY: Exactly. Yeah. And the other thing to remember, of course, is we're surrounded by these plants here in 2025. If these did come from seed, it was in 2023. So if we're thinking about weather effects, we need to be thinking 2 years ago. And if we want to know how those rosettes are going to do, if that has anything to do with the weather, that's going to be 25 to 26. So it's it's a complicated business to try and relate ragwort to weather conditions. It looks to me and based on what we've just been discussing, the disturbance regime is much more variable from place to place than the weather is. And that's I think why you get such big space to place variation in ragwort populations in any one summer.

ISABELLA TREE: So you are just demonstrating with your hands with your bare hands pulling up a ragwort plant. And as a child I was always told don't touch it, you know, and then if you lick your fingers after touching a ragwort plant, you'll die.

And if you eat honey from bees that have been sucking the nectar from those plants on your toast, you will die. Fake news. Fake news.

PROF. CRAWLEY: Yeah.

ISABELLA TREE: So at Knepp, what we do is, you know, according to the government's own guidelines is we have created a buffer zone inside our perimeter fence of 50 m where we constantly top it. We make sure it never kind of appears so that at least it it kind of looks like we're not spreading Ragwort even if it's not possible in a way for us to. But do you think those guidelines are are worth having or is it just some for show?

PROF. CRAWLEY: It's entirely cosmetic.

ISABELLA TREE: Is it? I'd say we're spending tens of thousands of pounds

PROF. CRAWLEY: Think about it. You're doing it every year. How can how come it's every year if you've been doing it every year? Surely if you're exterminating the rag, it would only take at least at most two years to do it. You kill this year's flowers this year and then this the rosettes next year and then you're done. But of course it's not like that is it? It's a lifetime job trying to eliminate Ragwort because it's limited by recruitment from a seed bank which is very very large.

ISABELLA TREE: So where should we be even thinking about trying to control it and how would you go about that?

PROF. CRAWLEY: It's an interesting question because I think as an ecologist I wouldn't control it anywhere except in what was going to be a hayfield. If you go to its really natural habitat, which are coastal sand dunes, you you you just see exactly the circumstances in which that that plant is happy. There's lots of bare sand, so lots of opportunity for recruitment from seed and lots of rabbits. So that's Ragwort in its absolutely here. It's it's much more dependent on other things. Ragwort isn't in control of its own destiny here because it's relying on the disturbance regime. your pigs, your horses, your cattle are doing the recruitment limitation for it. They're creating the opportunities for seedlings to come out of the seed bank or sometimes from fresh seed. We mustn't pretend that there's no recruitment from fresh seed. And without those herbivores, those large herbivores, it would be a much less common plant. When you're talking about there is some recruitment from fresh seed, were you saying in in in your studies from um Silwood that actually the more viable seeds are heavier and so they fall closer to the plant anyway. So that this fluff we're seeing that is kind of being blown off by the wind is probably carrying seeds that aren't viable anyway. immigrate. So they go down the green stem that's left and then out into the grass and they wander around looking for a plants that didn't get egg batches and at that time they're very prone to mortality. So it's interesting what mom is doing. She's actually committing her offspring to a life of peril because she knows in evolutionary terms that that's too many eggs for one plant.

ISABELLA TREE: And there's no way that they're going to get predated on the plant. That's why they're colored golden black because all the birds who would otherwise eat them have learned through bitter experience. You don't eat cinnabar caterpillars. You vomiting up.

PROF. CRAWLEY: Yes. So the the thing is about the cinnabar then if it gets an egg batch it will be defoliated and if it's defoliated it won't produce any seeds and if it doesn't produce any seeds it's going to turn into a perennial it's going to survive So the cinnabar moth is the world's worst bio control agent biocontrol agents are supposed to increase the death rate of the target plant but cinnabar moth reduces it now the other one which is you probably won't know because it's so inconspicuous is called Longitarsus jacobaeae and it's a it's a little beetle, a flea beetle.

ISABELLA TREE: What's it? Does it have a common name?

PROF. CRAWLEY: Ragwort flea beetle. I think I just made that up. But the lady there lays her eggs into the soil at the bottom of the plant and the larvae, the grubs live by eating the rootstock of the ragwort plant which remember that's where the reserves are which allow it to perennate. So they really are the cavalry. They are the cavalry and they they have in some places been successful by control agents, but Cinnabar has never been. But because it's so spectacular in its impact, it's the most repeated failure in all of global bio control.

ISABELLA TREE: I love it. So Mick, how are we going to get all these raw myths to lie down? How are we going to get these this fake news to disappear?

PROF. CRAWLEY: The short answer is we need all to learn to love it. That's that's the real way to solve it because then all this fuss will go away and it'll become the native wildflower that it's always been. So learn to love it, celebrate it, learn to love those beautiful moths that come and eat it but do absolutely nothing to control it and just enjoy it.

ISABELLA TREE: Exactly. Well, I hope this discussion has laid some myths to rest and put ragwort into perspective and perhaps even given some space in your heads for enjoying and celebrating this incredible native wildflower. If you'd like to read more, do look at our ragwort blog on our website. Just scroll down the page to blog and find our latest ragwort blog. And there's also a chapter called living with the yellow peril in my book Wilding. And if you'd like to come and see ragwort in all its glory before the summer's out, just come and visit us at Knepp.