

UK Railway Weed Spraying Data control



Statistics

- We treat 19,500 miles of track 1.5 times in one season.
- We have 5,000,000 neighbours.
- We use 66,000 litres dff & glyphosate mix
- We use 45,000 litres glyphosate on restricted sites

Why we need to spray

Faversham 2014



Avonmouth 2014

We use a combination of residual and non-residual herbicides

- Due to the time demands on the railway we have very little white space between trains to operate the Weed-Spray train.
- Freight traffic and track maintenance mostly takes place at night leaving little white space.
- 1st treatment we spray all unrestricted sites with DFF glyphosate, and restricted sites with glyphosate only.
- Some “No Spray” sites are hand pulled and ballast cleaned more regularly.
- 2nd spray we treat all Glyphosate only sites and missed or historically problematic areas.

The NR Database Information

Network Rail have a written agreement with the Environment Agency and Water UK to protect drinking water, surface water and groundwater.

This agreement also protects SSSIs.

Annually the EA gathers geographical information on which areas need protection and feed it through to JSD.

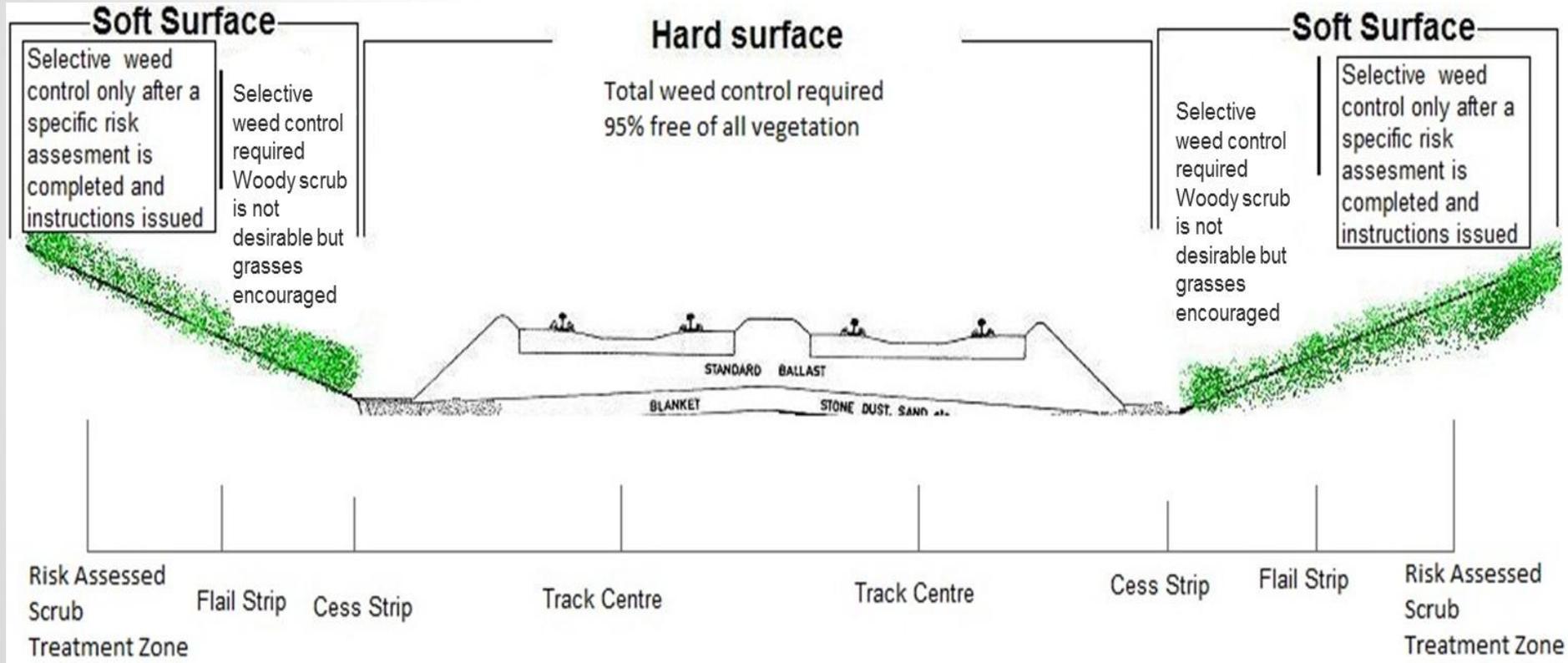
JSD then update the database which writes the task sheet.

Example of information on restrictions

This is data from the EA and is used to calculate the route mileage, this is then added into the database Restricted Sites list. From there the Dictionary tables are made up, which is the base information for the task lists instruction to the operator.

Site 2011	Water Company/Private Abstractor	Agency region	Ground/Surface water	Restriction NGR (start)	Restriction NGR (finish)	Track length (km)
Buckland Mill (Arjo A)	Folkestone & Dover WS	Southern	GW	TR 304 426	TR 310 428	1.23
Buckland Mill (Arjo A)	Folkestone & Dover WS	Southern	GW	TR 304 426	TR 283 442	2.707
Connaught	Folkestone & Dover WS	Southern	GW	TR 310 428	TR 322 435	1.5
Denge	Folkestone & Dover WS	Southern	GW	TR 059 207	TR078 191	2.71
Dover Priory	Folkestone & Dover WS	Southern	GW	TR 313 415	TR 313 414	0.14
Kingsdown	Folkestone & Dover WS	Southern	GW	TR 350 482	TR 355 488	0.94
Primrose	Folkestone & Dover WS	Southern	GW	TR 307 423	TR 304 426	0.38
Stonehall	Folkestone & Dover WS	Southern	GW	TR 271 454	TR 264 465	1.27
Kemsley	Grovehurst Energy Ltd	Southern	GW	TQ 884 648	TQ 900 653	2.2
Kemsley, Senora	Grovehurst Energy Ltd	Southern	GW	TQ 884 648	TQ 921 639	3.91
East Coast Main Line (Chilton Land to Charlton Grange)	Hartlepool Water	North East	GW	NZ 303 313	NZ 398 225	14
East Coast Main Line (Darlington Station to Coxhoe F'path)	Hartlepool Water	North East	GW	NZ 295 142	NZ 300 350	24
Kimberley Clark, Portlake, Pittlake	Kimberley Clark Ltd	Southern	GW	TQ 631 736	TQ 618 743	1.62
Billingham - Sunderland	Northumbrian Water	North East	GW	NZ 51715 31997	NZ 39021 56655	
East Coast Main Line - Berwick upon Tweed	Northumbrian Water	North East	GW	NU 00077 51702	NT 99063 52451	1.3

Where treatment is permitted



How we manage these responsibilities

- Nationally we have 19,500 miles track.
- The NR Weed-spray database is split into 25,000 items
- Task sheets are a specific instructions for the Spray Train Operator.
- Record of applications are made and the details kept for;
 - 1.Who.
 - 2.What.
 - 3.When.
 - 4.Where
 - 5.How much
 - 6.Weather conditions during application.

Weed – Spray Task sheet



2015 First Spray
Circuit No.: SCO132



Date: Wed 03 June 2015
 Booked Departure Time: 14:00
 Actual Departure Time: 14:00
 Booked Arrival Time: 21:29
 Actual Arrival Time: 21:34

Team Leader: Jim Muir (116675)
 Operator(s): 1st Spray - Not Required (0000)
 Driver: D cowan mossend

MPV No: 98911 Headcode: 6Z06

Weather: Dry
 Wind: Light Air

Tank No	Contents	Usage	Active Ingredient	Application Rate	Quantity Used?*
3	Pistol	First Treatment	Diflufenican	4.5 l/ha	340
2	Roundup Star	First Treatment 50/50	Glyphosate	4 l/ha	150
4	Roundup Star	GLY Only	Glyphosate	4 l/ha	5
5	Water	&TM1008@0.07%	n/a	200 l/ha	15660

Comments:

Track Spray	Planned (mi)	% of Planned	Actual (mi)	% of Actual	% Done of Planned
Scotland	83.3250	100.00	83.3250	100.00	100.00
TOTAL	83.3250	100.00	83.3250	100.00	100.00

Done (miles)	A	B	C	D	E	I	N	O	P	R	T	X	Z
24 83.3250													

Done - Treatment Complete A - Awaiting Spares B - Not Required by Area C - Cancelled before penalty period D - Driver (None, Late, Error) E - External (Weather, Fatality) I - Infrastructure Failure
 (Track Circuit Fault, Points Failure, Broken Rail, Emergency Possession etc.) N - Wrong route/diverted O - Operator (None, Late, Error) P - Booked Possession R - Replenishment T - MPV Failure X - Not in timings
 Z - Spray Equipment Fail
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#	LoR	ELR	Name	Type	Start	End	Track Spray Restriction	Track Treat Code	Scrub Spray Restriction	Infestation	Sig Stops	Possn. No.
1			[INSTR.] [TB] MOSSEND DOWN YARD		0.00	0.00		//////////				
2			[TRANSIT] to Dumbarton Central		0.00	0.00		//////////				
3	SC123	NEM7	AT DUMBARTON LOOP	DOWN HELENSB URGH	15.73	16.16		Done				
4			[TRANSIT] to Craighendran Jn		0.00	0.00		//////////				
5	SC141	WHL	AT CRAIGENDORAN JN	MAIN AT CROSSIN G LOOP	-0.01	0.06		Done				
6	SC141	WHL	CRAIGENDORAN JN - GARELOCHHEAD	SINGLE	0.06	8.68		Done		Knotweed		
7	SC141	WHL	GARELOCHHEAD DOWN PLATFORM	DOWN CROSSIN G LOOP	8.68	9.06		Done				
8	SC141	WHL	GARELOCHHEAD NORTH - GLEN DOUGLAS	SINGLE	9.06	15.12		Done				
9	SC141	WHL	GLEN DOUGLAS DOWN LOOP	DOWN CROSSIN G LOOP	15.12	15.29		Done				
10	SC141	WHL	GLEN DOUGLAS - ARROCHAR	SINGLE	15.29	19.36		Done				
11	SC141	WHL	ARROCHAR & TARBET DOWN PLATFORM	DOWN CROSSIN G LOOP	19.36	19.53	GLY Only	Done				
12			[TRANSIT] to Ardlui		0.00	0.00		//////////				
13	SC141	WHL	ARDLUI DOWN PLATFORM	DOWN CROSSIN G LOOP	27.40	27.56	GLY Only	Done		Knotweed		
14			[TRANSIT] to Crianlarich		0.00	0.00		//////////				
15	SC141	WHL	CRANLARICH DOWN PLATFORM	DOWN CROSSIN G LOOP	36.11	36.30		Done				

Done - Treatment Complete A - Awaiting Spares B - Not Required by Area C - Cancelled before penalty period D - Driver (None, Late, Error) E - External (Weather, Fatality) I - Infrastructure Failure (Track Circuit Fault, Points Failure, Broken Rail, Emergency Possession etc.) N - Wrong route/diverted O - Operator (None, Late, Error) P - Booked Possession R - Replenishment T - MPV Failure X - Not in timings Z - Spray Equipment Fail
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GPS Mapping Development 2016

- Starting in 2016 will see the introduction of a simple user friendly GPS technology in the Weed-spray module. This will verify that the treatment has been delivered with accuracy and is adjustable to within 5 meters. We hope to achieve a 6 channel system reporting way points every 500 meters as standard, also recording and reporting change of status i.e. when a nozzle is switched on or off.
- The information recorded would be which track zone is treated - 4ft, left and right cess in both directions and BSM left and right.



Hand-Spray areas

Not all areas of the infrastructure are accessible to the train borne treatment, sites such as sidings and up to buffer stops in bay platforms. These are treated by hand.

- Through the Weed-Spray database we are able to operate an enhanced reporting and monitoring system for the Hand-spray that compliments the train-spray reporting.

- Each hand-spray site will be pinned on a map with all its details,

- 1.Name,

- 2.Treatment type

- 3.ELR mileage

- 4.DU responsible

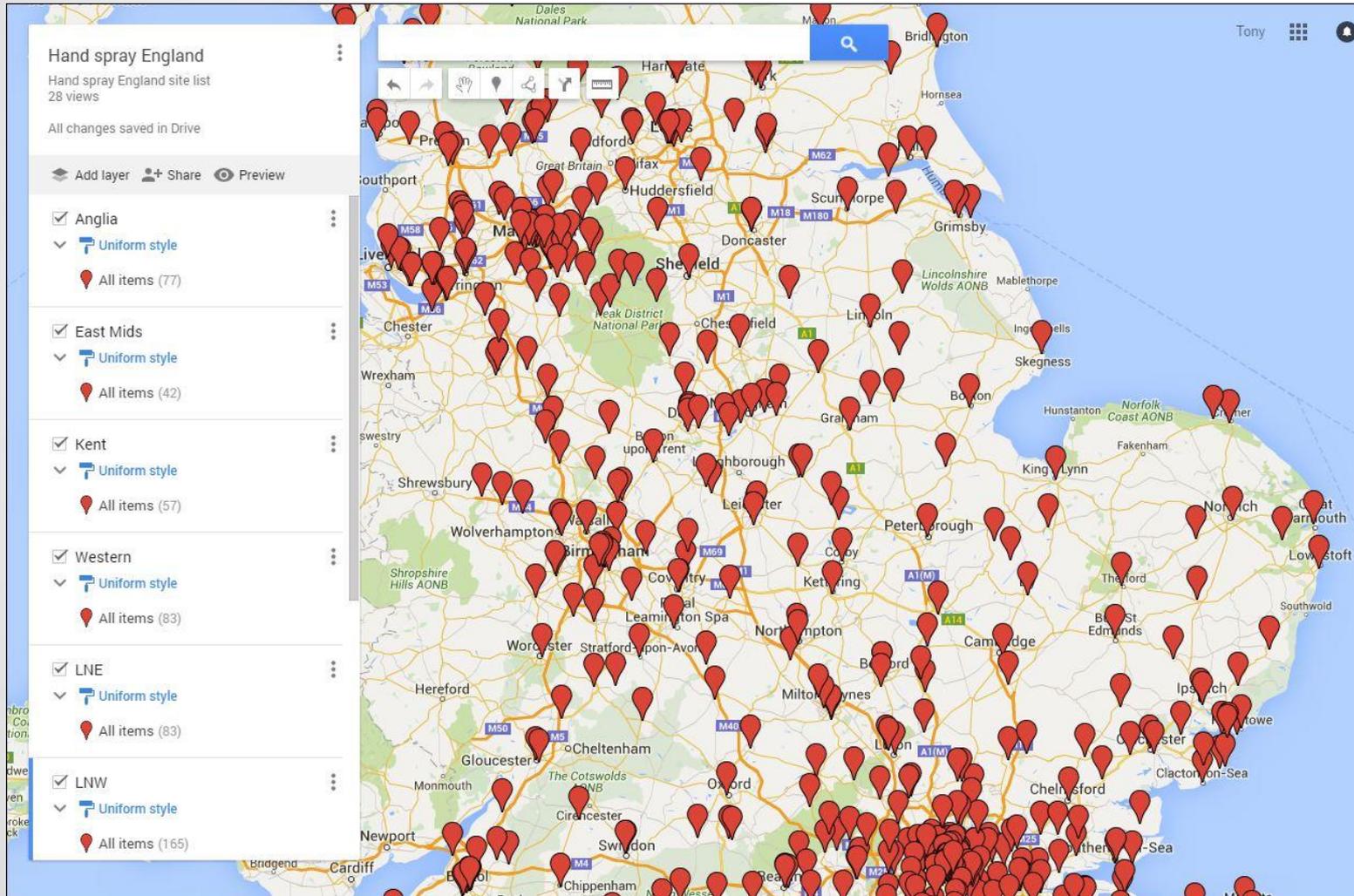
- 5.Task sheet

- 6.Photographs of monitoring.

- Access to the information would be through database login on a cloud based system.

- This will be developed and introduced through the 2016 season.

Example of the Hand-Spray site map web link from the database.



Example of map site photograph in the database

The screenshot shows a web application interface for managing map site data. The interface is divided into several sections:

- Left Sidebar:** Contains a list of layers and regions. The top layer is "Hand spray England" with 28 views. Below it are "Sussex" (34 items) and "Wessex" (56 items). A yellow callout box highlights the "Untitled layer" with an "Import" button and a message: "Add places to this layer by drawing or importing data. [Learn more](#)".
- Map:** A map of the South of England showing numerous red location pins. The map includes labels for various towns and cities such as Biggleswade, Haverhill, Sudbury, Braintree, Colchester, Witham, Helmsford, Maldon, Basildon, Southend-on-Sea, Canvey Island, Faversham, Maidstone, Tonbridge, Royal Tunbridge Wells, Crawley, Horsham, Haywards Heath, and Battle. Major roads like A11, A134, A17, A12, A14, A21, A22, A23, A25, A27, A272, A295, and A2070 are also visible.
- Central Pop-up Window:** A window titled "SXC01" displaying a photograph of a railway platform. Below the photo, the following metadata is shown:
 - Location: 51.282214, -0.078539
 - Area: Sussex
 - Site Name: CATERHAMButtons for "Save" and "Cancel" are at the bottom.

Example of site task list in the database

Hand spray England
Hand spray England site list
28 views
All changes saved in Drive

Add layer Share Preview

All items (00)

- LNE
Uniform style
All items (83)
- LNW
Uniform style
All items (165)
- Sussex
Uniform style
All items (34)
- Wessex
Uniform style
All items (56)

SXC01

2016 1st Spray Tasklist
Network Rail

Task ID	Task Name	Task Type	Task Status	Task Date	Task Time	Task Location	Task Notes
1	Apply spray	1	1	1	1	1	1
2	Apply spray	1	1	1	1	1	1
3	Apply spray	1	1	1	1	1	1
4	Apply spray	1	1	1	1	1	1
5	Apply spray	1	1	1	1	1	1
6	Apply spray	1	1	1	1	1	1
7	Apply spray	1	1	1	1	1	1
8	Apply spray	1	1	1	1	1	1
9	Apply spray	1	1	1	1	1	1
10	Apply spray	1	1	1	1	1	1
11	Apply spray	1	1	1	1	1	1
12	Apply spray	1	1	1	1	1	1
13	Apply spray	1	1	1	1	1	1
14	Apply spray	1	1	1	1	1	1
15	Apply spray	1	1	1	1	1	1
16	Apply spray	1	1	1	1	1	1
17	Apply spray	1	1	1	1	1	1
18	Apply spray	1	1	1	1	1	1
19	Apply spray	1	1	1	1	1	1
20	Apply spray	1	1	1	1	1	1
21	Apply spray	1	1	1	1	1	1
22	Apply spray	1	1	1	1	1	1
23	Apply spray	1	1	1	1	1	1
24	Apply spray	1	1	1	1	1	1
25	Apply spray	1	1	1	1	1	1
26	Apply spray	1	1	1	1	1	1
27	Apply spray	1	1	1	1	1	1
28	Apply spray	1	1	1	1	1	1
29	Apply spray	1	1	1	1	1	1
30	Apply spray	1	1	1	1	1	1
31	Apply spray	1	1	1	1	1	1
32	Apply spray	1	1	1	1	1	1
33	Apply spray	1	1	1	1	1	1
34	Apply spray	1	1	1	1	1	1
35	Apply spray	1	1	1	1	1	1
36	Apply spray	1	1	1	1	1	1
37	Apply spray	1	1	1	1	1	1
38	Apply spray	1	1	1	1	1	1
39	Apply spray	1	1	1	1	1	1
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42	Apply spray	1	1	1	1	1	1
43	Apply spray	1	1	1	1	1	1
44	Apply spray	1	1	1	1	1	1
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46	Apply spray	1	1	1	1	1	1
47	Apply spray	1	1	1	1	1	1
48	Apply spray	1	1	1	1	1	1
49	Apply spray	1	1	1	1	1	1
50	Apply spray	1	1	1	1	1	1
51	Apply spray	1	1	1	1	1	1
52	Apply spray	1	1	1	1	1	1
53	Apply spray	1	1	1	1	1	1
54	Apply spray	1	1	1	1	1	1
55	Apply spray	1	1	1	1	1	1
56	Apply spray	1	1	1	1	1	1
57	Apply spray	1	1	1	1	1	1
58	Apply spray	1	1	1	1	1	1
59	Apply spray	1	1	1	1	1	1
60	Apply spray	1	1	1	1	1	1
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63	Apply spray	1	1	1	1	1	1
64	Apply spray	1	1	1	1	1	1
65	Apply spray	1	1	1	1	1	1
66	Apply spray	1	1	1	1	1	1
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69	Apply spray	1	1	1	1	1	1
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73	Apply spray	1	1	1	1	1	1
74	Apply spray	1	1	1	1	1	1
75	Apply spray	1	1	1	1	1	1
76	Apply spray	1	1	1	1	1	1
77	Apply spray	1	1	1	1	1	1
78	Apply spray	1	1	1	1	1	1
79	Apply spray	1	1	1	1	1	1
80	Apply spray	1	1	1	1	1	1
81	Apply spray	1	1	1	1	1	1
82	Apply spray	1	1	1	1	1	1
83	Apply spray	1	1	1	1	1	1
84	Apply spray	1	1	1	1	1	1
85	Apply spray	1	1	1	1	1	1
86	Apply spray	1	1	1	1	1	1
87	Apply spray	1	1	1	1	1	1
88	Apply spray	1	1	1	1	1	1
89	Apply spray	1	1	1	1	1	1
90	Apply spray	1	1	1	1	1	1
91	Apply spray	1	1	1	1	1	1
92	Apply spray	1	1	1	1	1	1
93	Apply spray	1	1	1	1	1	1
94	Apply spray	1	1	1	1	1	1
95	Apply spray	1	1	1	1	1	1
96	Apply spray	1	1	1	1	1	1
97	Apply spray	1	1	1	1	1	1
98	Apply spray	1	1	1	1	1	1
99	Apply spray	1	1	1	1	1	1
100	Apply spray	1	1	1	1	1	1

Location 51.282214, -0.078539
Area Sussex
Site Name CATERHAM
51.28221, -0.07853

Hand-spray team GPS mapping

- It is important to monitor hand spray treatments so that they can be located in live time to aid the mapping data.
- Over the coming seasons each Hand-spray team leader will carry a simple tracker device, this will;
 1. Be linked to the data base
 2. Automatically record the treatment event
 3. Log date and time
- This information can then be displayed into the map system in live time and would enable stakeholders to log in and view current status of the treatment.

This is the standard we strive to attain



jsd rail 