GMS News

Late Summer 2019

Weeks 19-27

Contents

Editorial

The big news hot off the press is that the Garden Moth Scheme could be expanding into other parts of the world. Dave Grundy, who many of you know founded GMS in 2003, gave a talk on the scheme to a conference in India, the upshot of which was an invitation to advise on setting up a similar citizen science scheme there! I would imagine that differences in geography and biodiversity will mean that the scheme's details will have to be modified to suit local conditions, but it will be interesting to see how the initiative progresses. We'll keep you informed of course.

Closer to home Evan's report shows that catches in the last quarter were the highest for 10 years. Evan also has a look at two species that did really well, the Large Yellow Underwing and the Garden Grass-veneer – how would you like to have 600 of these in your trap at once? One disappointing aspect was the reduced number of recorders submitting their results, quite a lot fewer than the previous quarter for some reason. Maybe you were too busy with all the moths.

In this issue we have two snippets from our recorders, in widely separated locations. I do welcome these contributions, so please keep them coming.

We can now confirm that the 2020 GMS Annual Conference will be held on Sunday 29th of March at the Idle Valley Rural Learning Centre, North Rd, Retford DN22 8SG. The programme is being developed and we hope to let you have it in our next newsletter.

Finally, if you trapped on 26th, 27th or 28th September you can enter your results on the Moth Night website at https://www.mothnight.info . The event is sponsored by Atropos, Butterfly Conservation and the Centre for Ecology and Hydrology.

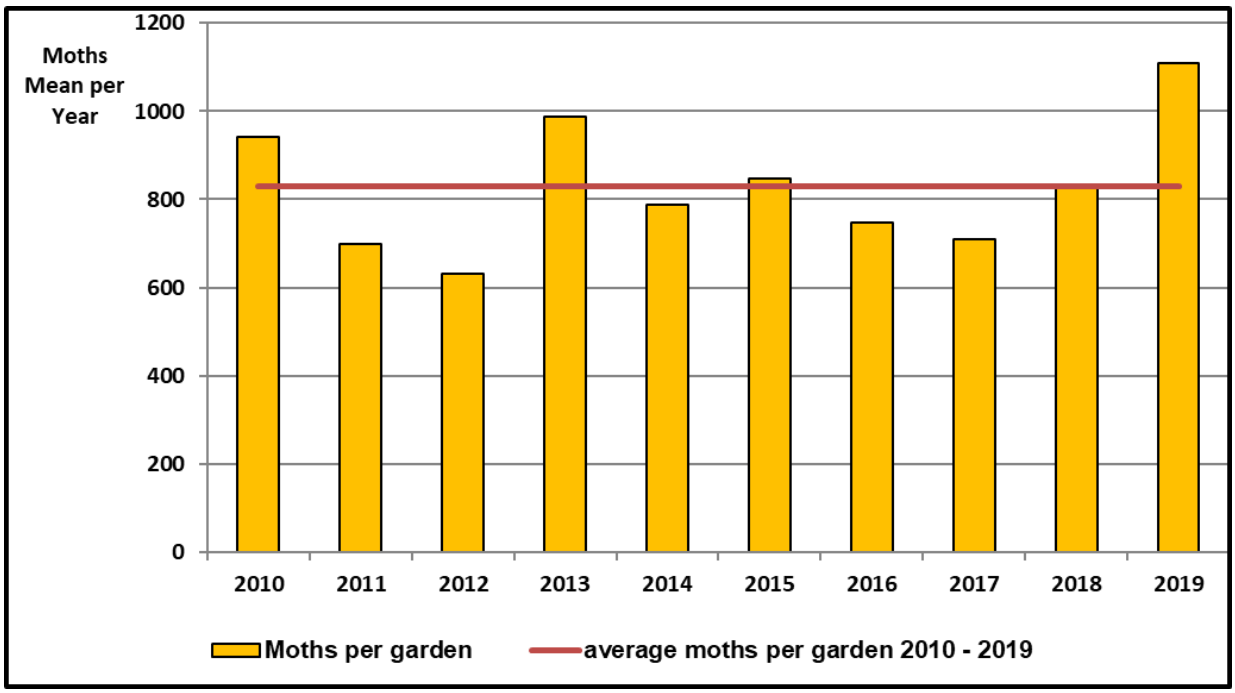
GMS 3rd QUARTER 2019 – Evan Lynn

This quarter has been exceptional both for the record high temperatures and for the number of moths caught exceeding that of 2013.

Yearly Comparisons

The high number of moths caught this quarter (fig 1) leads one to ask if the increase was due to a larger number of resident UK moths, or to more migrants swelling the indigenous population? Also was this a uniform increase across the whole moth spectrum or was it skewed by large populations of just a few species?

Fig 1. GMS 2010 - 2019 Q3. Mean Quarterly Moth Numbers



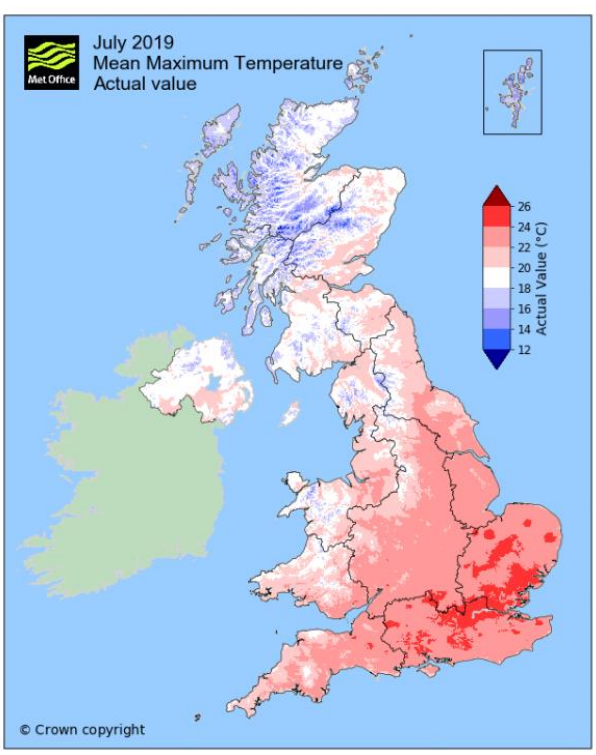
Temperature and Catches

July will be a month to be remembered both for relatively high temperatures, especially in the South East, and in parts of the country, heavy rainfall. Cambridge set a new record July temperature of 38.7°C slightly more than that of 38.5°C at Faversham in August 2003. Cheshire received more than twice the average precipitation and areas in central and northern England had more than one and a half times the typical July rainfall.

August continued with warm temperatures until interestingly two separate strands of the jet stream, which often carries areas of low pressures along its path, joined together to form a very strong jet stream transforming a minor depression into a major one. Following this, August appeared to be more autumnal with winds, rain and sun. The latter part of the month drew in warm air from the south bringing hot conditions to most areas.

The mean maximum temperatures for the quarter and the number of lightning strikes (thunderstorms) are shown in figures 2 & 3 which give an idea of both the hot weather and heavy rain some areas experienced.

Fig 2. Days of Mean Maximum Temperature for July & August 2019 (with permission of the Met Office)



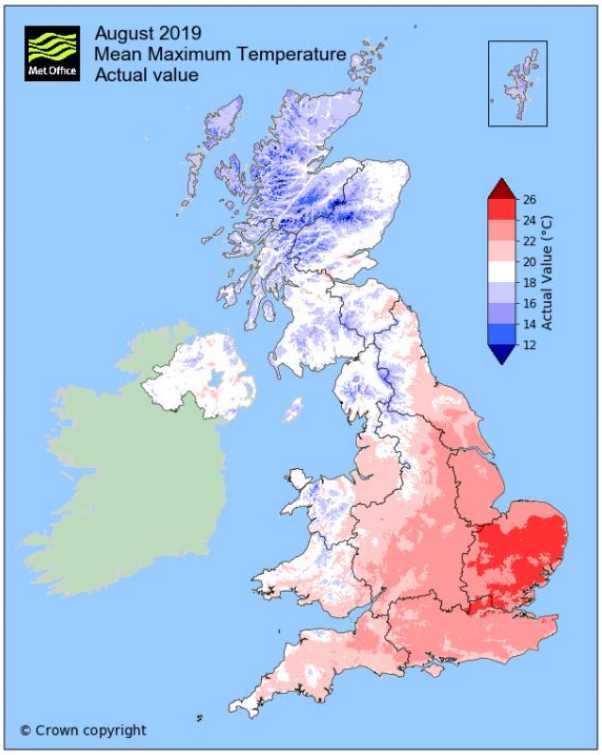
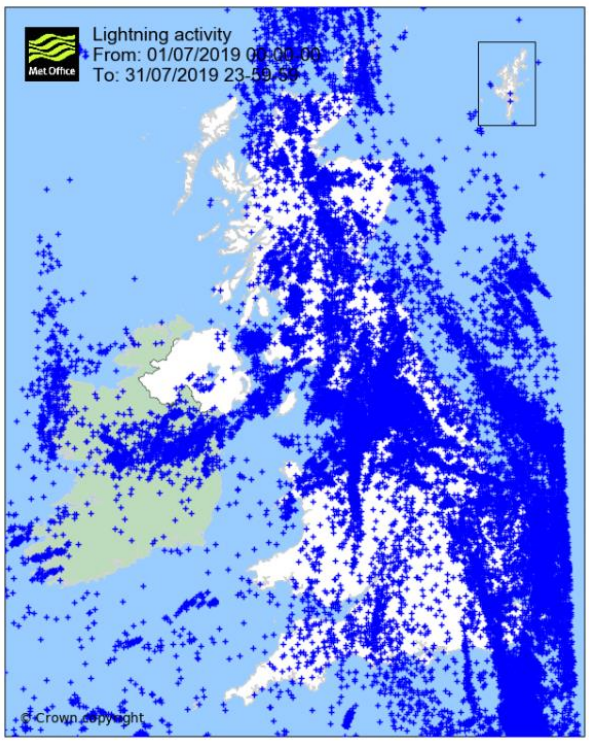
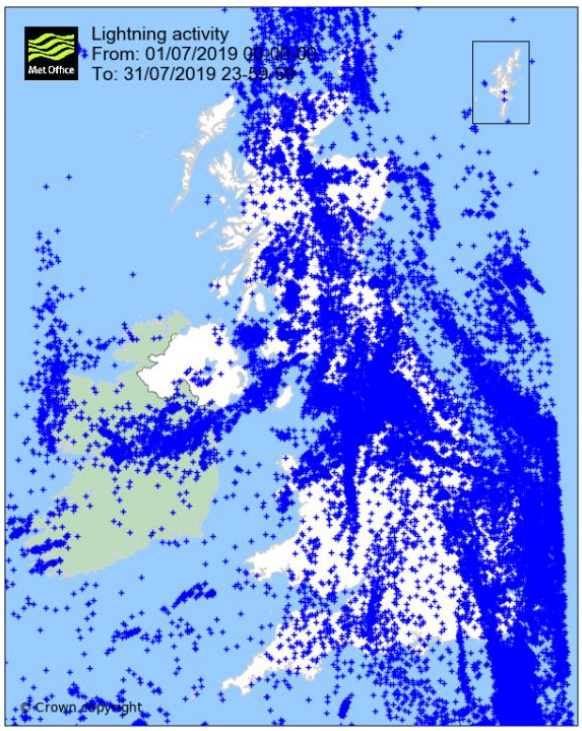


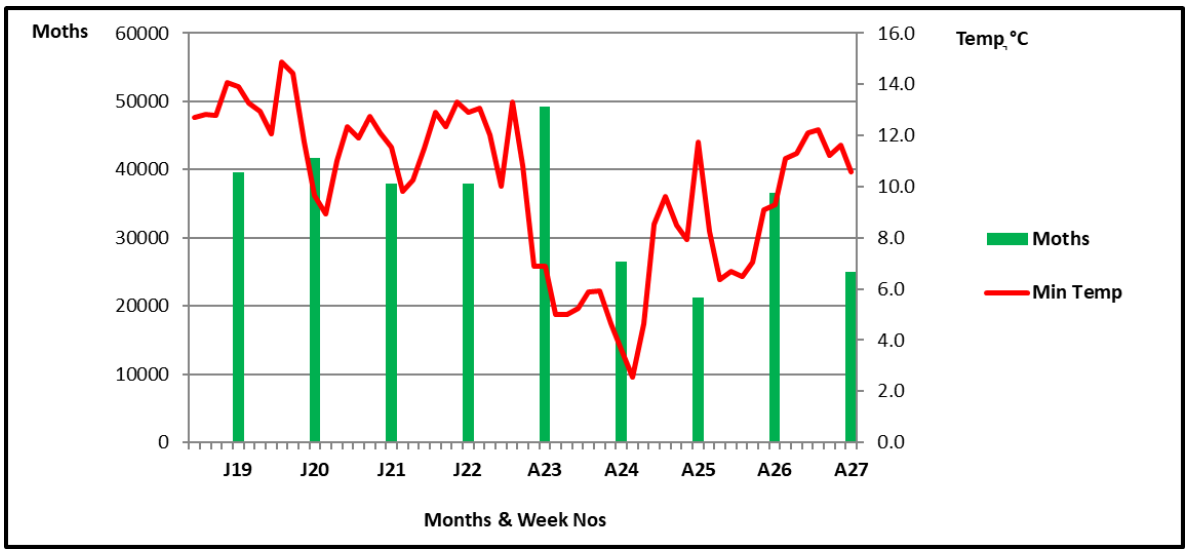
Fig 3. Days of Lightning Strikes (Thunderstorms) for July & August 2019 (with permission of the Met Office)





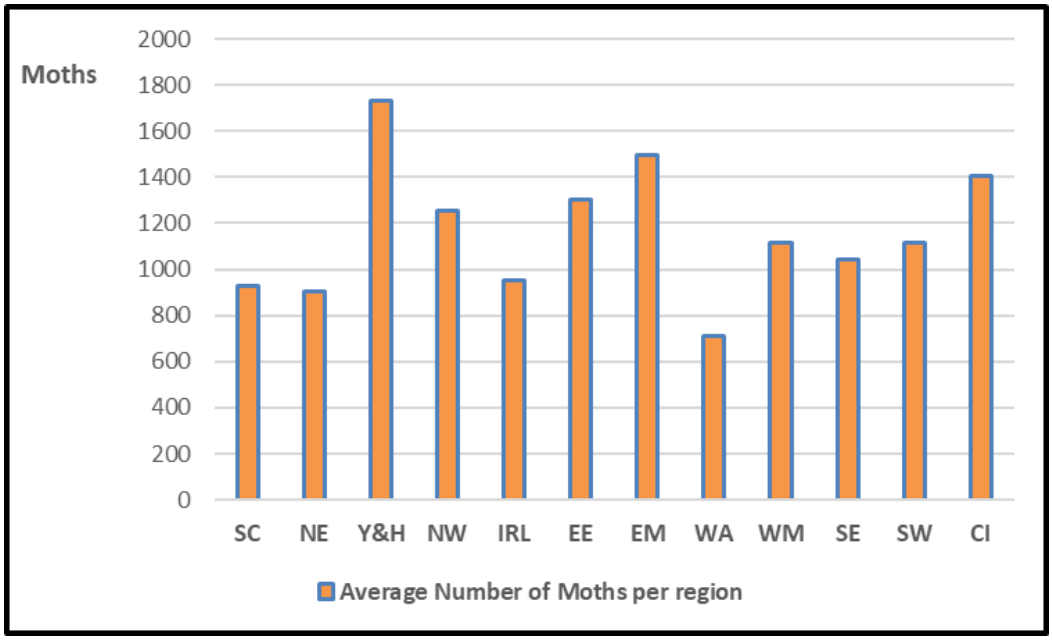
It was pleasing to find that in this quarter there were only four empty traps, remarkably, all on week 24 when the average minimum temperature for the Friday was 3.6°C, dropping to 2.5°C on the Saturday. For most of the quarter the night-time temperatures were seasonal providing good flying conditions for the moths, as shown below (fig 4).

Fig 4. GMS 2019 Q3. Minimum Night Temperatures and Total Moths Caught



Although this quarter had exceptionally good catches, they were not evenly distributed across the GMS regions (figure 5) the highest being Yorkshire & Humberside, followed by the East Midlands and the Channel Islands while Wales brought up the rear.

Fig 5. GMS 2019 Q3. Average Number of Moths per Region

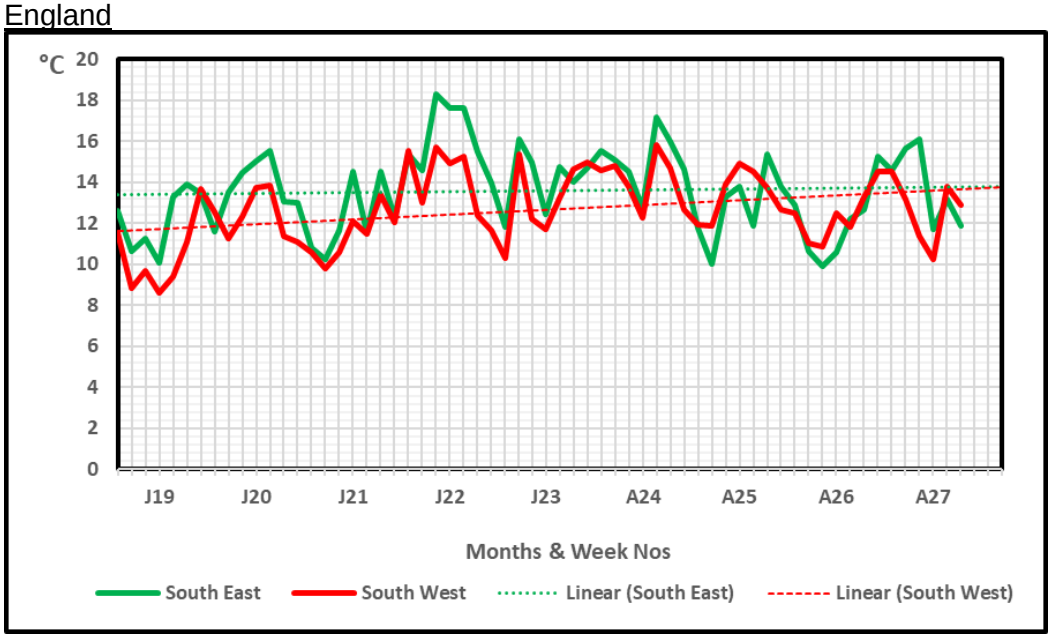


Regional Comparisons – South East and South West

Both the South East and South West are well known for the number of migrants flying across the Channel and amongst the list for this quarter saw the arrival of a new moth to Britain. We were met by an excited David Brown on his Dorset moth course in July with pictures of the Feline he had just caught the previous week at Kingsdown, Kent (Atropos 2019 No 64).
The minimum temperatures for these regions this quarter parallel each other (fig 6) so if this was the sole factor then the catches should be very similar. However, even this can be deceptive. Although these two regions are adjacent to each other, there can be differences in the weather as the South East is more influenced by the continent than the South West which

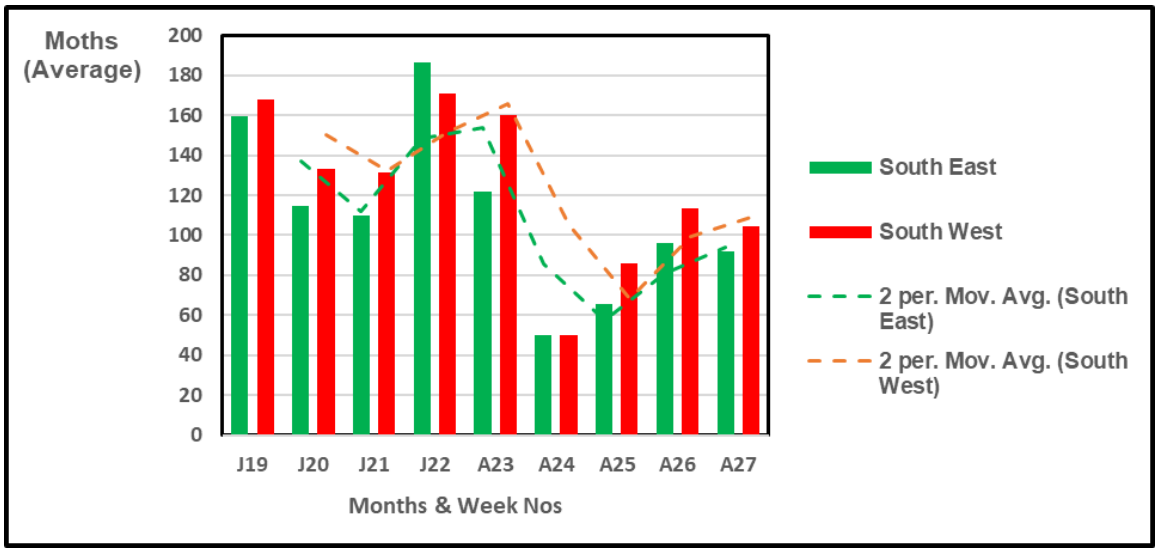
can have more of an Atlantic influence. Also, there are discrepancies in the geology, farming and suburbia – all of which can have a bearing on the number of moths caught.

Fig 6. GMS 2019 Q3. Minimum Temperatures in South East England & South West England



The catches of core species in Figure 7 do show this relationship albeit at different levels. When analysed by the moving average line (2 per Mov, Avg) it shows that for most of the quarter the South East catches follow those of the South West by a constant amount until towards the end when they close the distance.

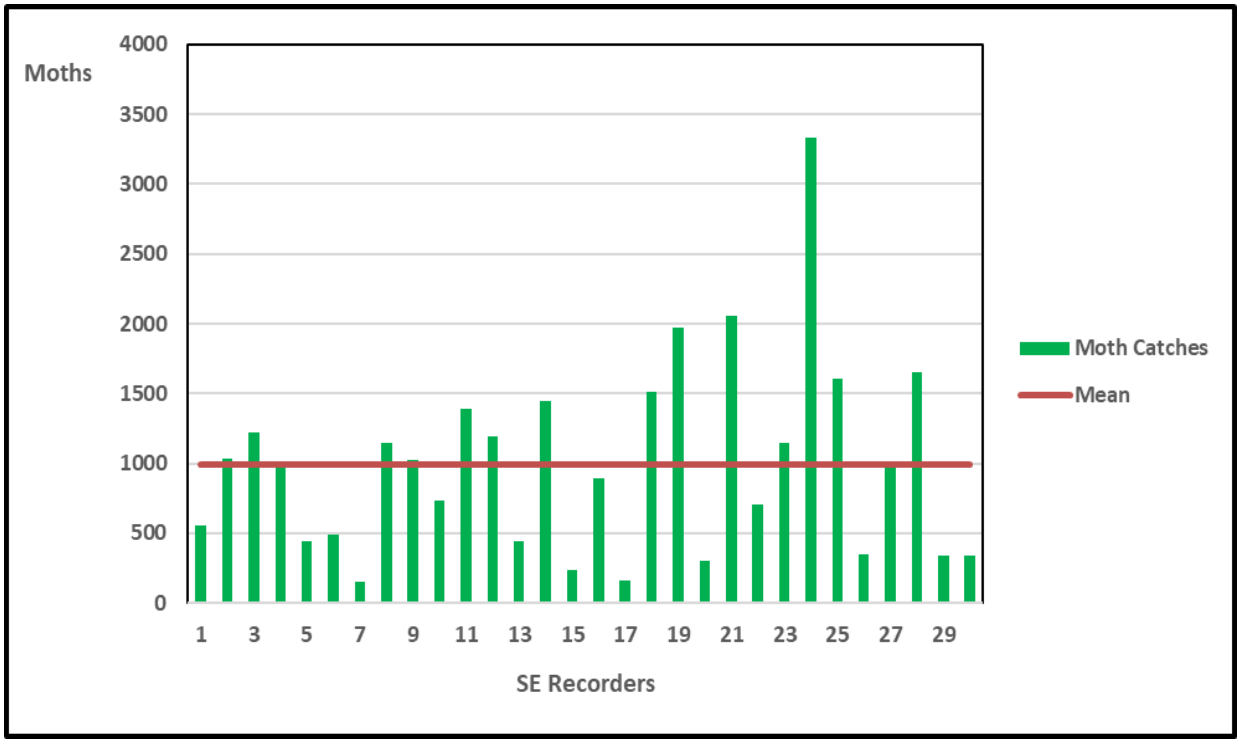
Fig 7. GMS 2019 Q3. Number of Core Moths Caught in the South East & South West Regions.



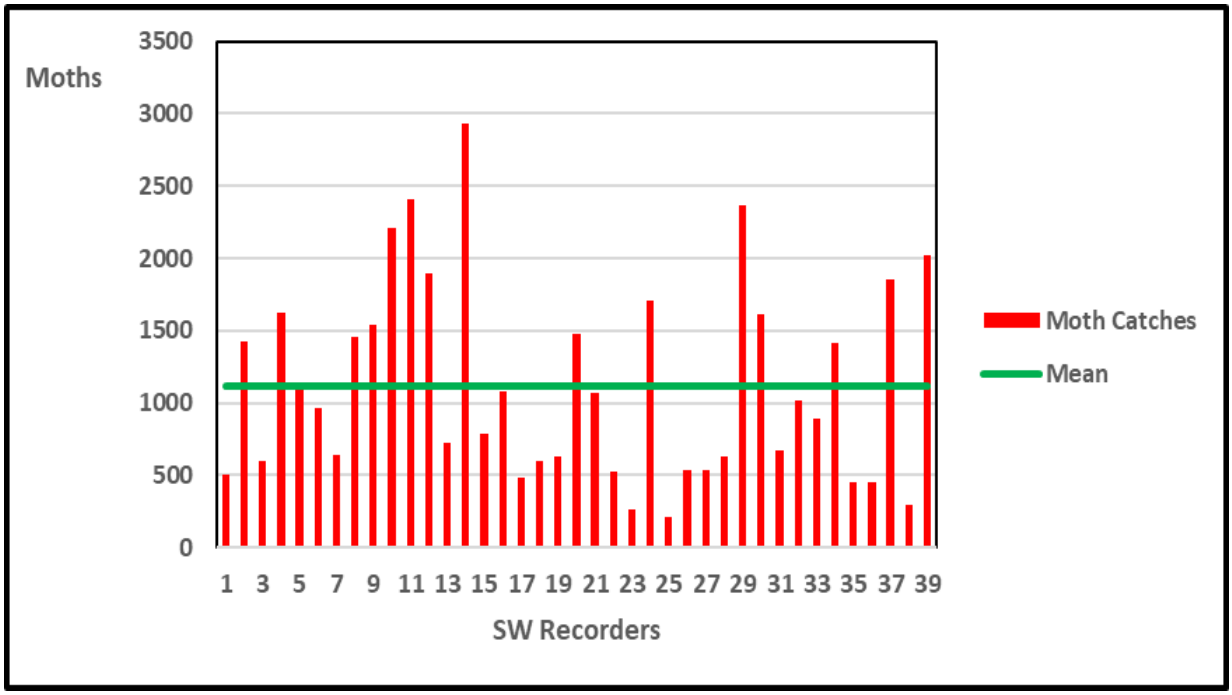
Even when the previously mentioned factors are accounted for the diversity of traps being used in both regions could also be a contributing factor. The selection of traps being used range from powerful MVs that can be spotted from the International Space Station to small actinic traps. The number of moths caught by each recorder in these regions is shown in Figure 8, their quantities no doubt reflecting both their intensity of light and position in relation to moth abundance.

Fig 8. GMS 2019 Q3. No. of Moths Caught by Recorders in both the SE and SW of England

South East

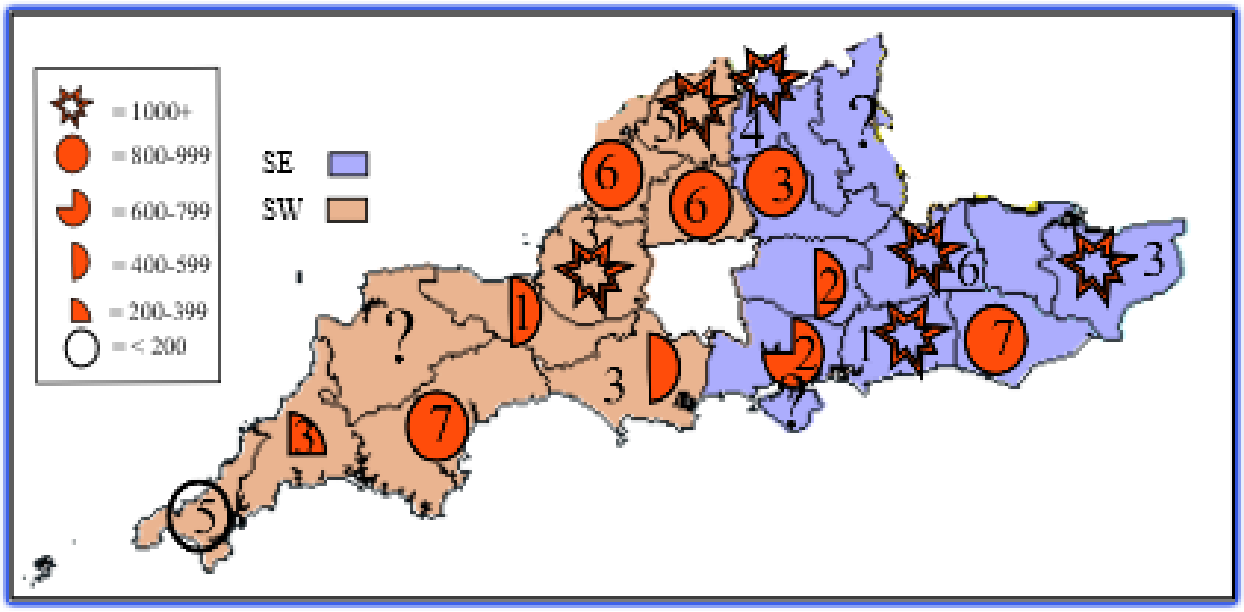


South West



The geographical location of the recorders can also make a difference with the largest number of moths being caught the further east and north from Land's End. This is shown in figure 9 with the scale for the mean number of moths caught together with the number of recorders per Vice County. The Vice Counties with question marks indicate no returns were received in time for publication.

Fig 9. GMS 2019 Q3. Vice County Map of the South East and South West of England showing the Mean Number of Moths Caught per Vice County together with their Number of Recorders.



Statistics

The number of moths this quarter has exceeded those of the previous 9 years (fig1), so what has happened to produce this increase? Maybe cold weather in February and March helped with a better survival rate of larvae and pupae. Or possibly, southerly winds, thunderstorms and the various tropical plumes of hot air bought many more moths from the continent which would seem to be the case when looking at the Large Yellow Underwing (up 115%) and the Diamond-back Moth (up 4%).

As introduced last quarter I have added a column for the trap site numbers. These show the number of different sites where a species was caught, regardless of the quantity and repeat captures. This is relevant as not every recorder catches the same moth. Last year five gardens failed to see the Large Yellow Underwing while this year they were seen by every recorder.

Table 1. GMS Q3 2019 – Top 20 Core Species

Position		Top 20 species	Mean Per Trap		% Change	Trap sites	
2018	2019		2018	2019		2018	2019
1	1	Large Yellow Underwing	79	194.9	116	329	308
4	2	Dark Arches	27.8	70.3	42.5	319	304
10	3	Garden Grass-veneer	19	57.5	38.5	223	256
3	4	Uncertain/Rustic agg.	33.7	55.4	21.7	268	262
11	5	Heart and Dart	19	52.4	33.3	306	281
2	6	Common Rustic agg.	33.9	44.4	10.6	318	258
5	7	Setaceous Hebrew Character	26.9	31.2	4.3	258	228
9	8	Lesser B-b Yellow Underwing	19.3	30.6	11.3	312	263
7	9	Common Footman	20.7	28.2	7.5	269	265
6	10	Riband Wave	20.9	27.6	6.7	316	296
14	11	Agriphila tristella	16.4	21.3	4.9	255	228
15	12	Square-spot Rustic	12.3	19.7	7.4	268	226
26	13	Lesser Yellow Underwing	7.7	18.4	10.7	276	241
21	14	Light Brown Apple Moth	9.9	16.4	6.5	229	227
8	15	Agriphila straminella	20.4	15.6	-4.7	222	245
12	16	Mother of Pearl	18.2	13.7	-4.5	275	191
16	17	Vine's Rustic	11.1	11.5	0.4	135	215
24	18	Smoky Wainscot	9.7	11.3	1.6	228	127
30	19	Diamond-back Moth	6.3	10.6	4.3	186	166
22	20	Willow Beauty	9.9	10.5	0.6	282	203
			334 Gardens	308 Gardens			

The mean number of the top ten moths as well as the number of recorders in each region is shown in Table 2. Despite doubling in numbers, the Large Yellow Underwing did not feature as number one moth in two regions. In the Channel Islands it was usurped by the Diamond-back Moth, where one recorder had the unenviable pleasure of counting 200 in week 23. And in the East of England it was down in third place behind Uncertain/Rustic agg. and the Setaceous Hebrew Character.

Table 2. GMS 2019 Q3. Top 10 Regional Species

Scotland (22)	Mean	North East (27)	Mean	North West (34)	Mean
Large Yellow Underwing	201.3	Large Yellow Underwing	295.3	Large Yellow Underwing	436.4
Common Rustic agg.	44.4	Dark Arches	92.7	Dark Arches	131.1
Lesser Yellow Underwing	38.7	Common Rustic agg.	28.4	Common Rustic agg.	54
Lesser B-b Y Underwing	34.3	Common Footman	27.6	Garden Grass-veneer	46.2
Agriphila tristella	20.3	Garden Grass-veneer	23	Heart and Dart	43.9
Antler Moth	20.3	Lesser B-b Y Underwing	21.8	Lesser B-b Y Underwing	29.9
Dotted Clay	19.9	Lesser Yellow Underwing	21.5	Riband Wave	29.7
Smoky Wainscot	19.6	Smoky Wainscot	20.6	Uncertain/Rustic agg.	24.4
True Lover's Knot	18.2	*Agriphila tristella*	19.3	Common Footman	23.5
Garden Grass-veneer	15.2	Antler Moth	18.1	Lesser Yellow Underwing	19.6
Yorks & Humber (11)	Mean	Ireland (26)	Mean	East of England (31)	Mean
Large Yellow Underwing	280.7	Large Yellow Underwing	152.2	Uncertain/Rustic agg.	97.7
Garden Grass-veneer	227.8	Heart and Dart	94.5	Set Hebrew Character	94.5
Dark Arches	85.1	Common Rustic agg.	59.1	Large Yellow Underwing	82
Uncertain/Rustic agg.	71.6	Garden Grass-veneer	45.8	Garden Grass-veneer	71.9
Common Rustic agg.	65.5	Lesser B-b Y Underwing	45.1	Turnip Moth	66.2
Set Hebrew Character	63.8	Dark Arches	40.5	Dark Arches	45.6
Heart and Dart	57.9	Square-spot Rustic	32.3	Common Rustic agg.	40.2
Agriphila straminella	48.4	Uncertain/Rustic agg.	26	Lesser B-b Y Underwing	35.1
Common Footman	46.6	Lesser Yellow Underwing	25.3	Common Footman	30.6
Agriphila tristella	37.7	Riband Wave	17.1	Vine's Rustic	26.5
East Midlands (32)	Mean	West Midlands (20)	Mean	Wales (34)	Mean
Large Yellow Underwing	248	Large Yellow Underwing	202.7	Large Yellow Underwing	120.1
Dark Arches	123.9	Garden Grass-veneer	78.2	Heart and Dart	72.7
Uncertain/Rustic agg.	94.1	Uncertain/Rustic agg.	76.2	Uncertain/Rustic agg.	33.5
Set Hebrew Character	81.7	Heart and Dart	74.2	Dark Arches	31.3
Garden Grass-veneer	78.9	Dark Arches	62.1	Common Footman	25.8
Heart and Dart	66.2	Common Footman	46.8	Garden Grass-veneer	24
Common Rustic agg.	57.1	Lesser B-b Y Underwing	42.9	Common Rustic agg.	18.3
Riband Wave	50.7	Common Rustic agg.	35.8	*Agriphila straminella*	18
Common Footman	37.2	Riband Wave	33.1	Set Hebrew Character	17.5
Lesser Yellow Underwing	31.9	Square-spot Rustic	30.4	Riband Wave	16.9
South East (30)	Mean	Southwest (39)	Mean	Channel Islands (2)	Mean
Large Yellow Underwing	88.8	Large Yellow Underwing	146.9	Diamond-back Moth	136
Garden Grass-veneer	63.1	Uncertain/Rustic agg.	76.5	Large Yellow Underwing	100.5
Uncertain/Rustic agg.	44.4	Heart and Dart	69.3	Common Rustic agg.	55
Heart and Dart	42.6	Garden Grass-veneer	61.1	Shuttle-shaped Dart	53
Dark Arches	40.4	Common Rustic agg.	58	Rusty-dot Pearl	48.5
Common Footman	35.8	Dark Arches	43.3	Garden Grass-veneer	42.5
Lesser B-b Y Underwing	35.4	Common Footman	42.4	Vine's Rustic	40.5
Common Rustic agg.	33.7	Lesser B-b Y Underwing	38.3	Riband Wave	33
Riband Wave	29.8	Riband Wave	31.8	Lesser B-b Y Underwing	26.5
Square-spot Rustic	28.8	Vines Rustic	24.2	Uncertain/Rustic agg.	25

The minimum and maximum moth numbers both within and between regions over the nine-week period vary considerably as were shown in the comparison between the South East and the South West Regions (fig 8), reflecting different catching methods and prevalent microclimates at each site. The number of gardens per region ranges between 2 in the Channel Islands to 39 in the South West with an average trapping effort of 95% (Table 3). Although Friday is the official night three nights either side are acceptable as everyone hopefully has a life apart from mothing.

Table 3. GMS Q3 2019 – Regional Statistics

Region	Gardens	Moths	Moths	Moths		Moth Trap Nights		
		Total	Mean	Min	Max	Possible	Actual	%
SC	22	20481	931	313	2603	198	185	93
NE	27	24326	901	112	2919	243	233	96
Y&H	11	19013	1728	59	3850	99	98	99
NW	34	42658	1255	300	4215	306	283	92
IRL	26	24694	950	74	2563	234	219	94
EE	31	40313	1300	161	4417	279	270	97
EM	32	47782	1493	544	3557	288	277	96
WA	34	24175	711	70	2385	306	287	94
WM	20	22275	1114	290	3546	180	169	94
SE	30	29866	996	153	3335	270	253	94
SW	39	43596	1118	208	2931	351	333	95
CI	2	2805	1402.5	950	1855	18	18	100

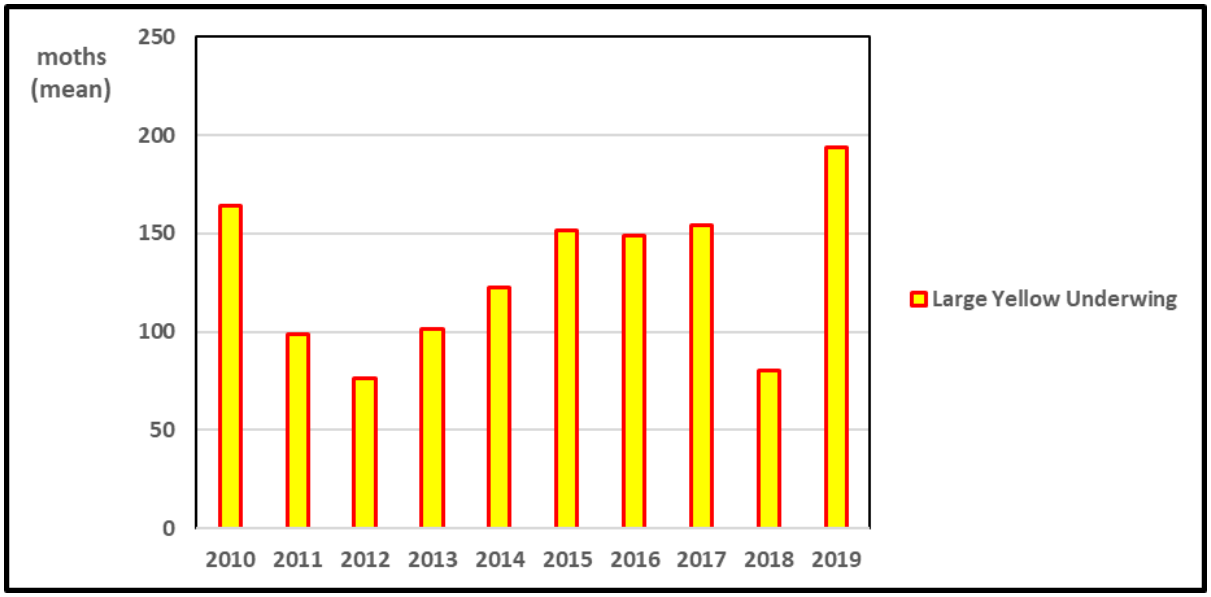
Night?	Tues	Wed	Thurs	Fri	Sat	Sun	Mon
Days	68	207	412	870	539	199	91
Percent	3	9	17	36	23	8	4

FEATURED SPECIES

Large Yellow Underwing (*Noctua pronuba*)

The number of moths caught this quarter has been augmented by a large number of a few species that have skewed the results hiding any rise and fall of the of the remaining moths. Such is the case of the Large Yellow Underwing that has increased 114% over last year which was not a bumper year for this moth anyway. (fig 10).

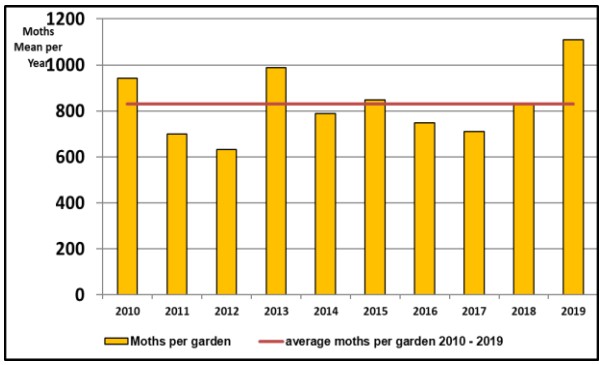
Fig 10. GMS 2010 - 2019 Q3. Mean Numbers of the Large Yellow Underwing



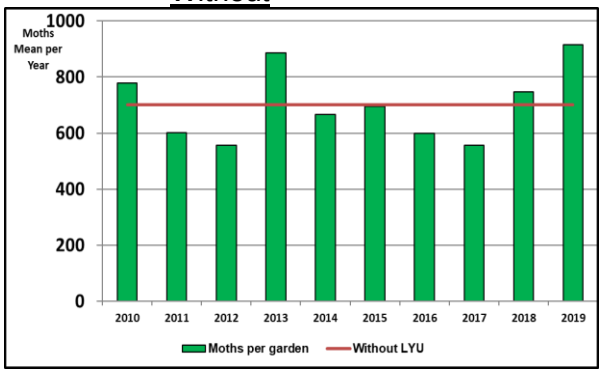
This can be shown in Figure 11 where the first chart shows the number of moths with the Large Yellow Underwing included; the second shows the effect when this moth is excluded with all years dropping in numbers as a result. Note that the vertical scale range drops from a maximum 1200 to 1000 after this moth is removed.

Fig 11. GMS 2010 - 2019 Q3. Mean Numbers with and without the Large Yellow Underwing

With



Without



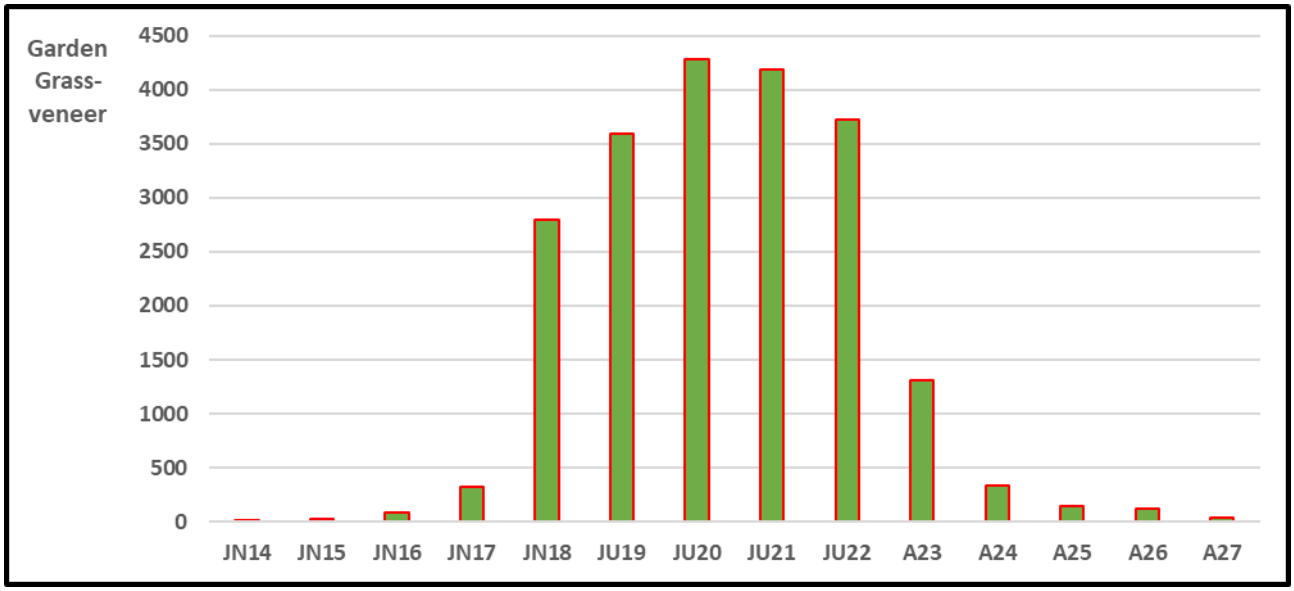
(note different vertical scales)

Garden Grass-veneer *(Chrysoteuchia culmella)*

Grass moths appear in swarms in rough grass in mid-summer and one of the moths contributing to the increase in numbers this quarter was the Garden Grass-veneer (*Chrysoteuchia culmella*). It is one of the commonest and the earliest of these grass moths to appear. They are deceptive in size appearing larger in flight than when folded up at rest. It may obtain its species name of ***Chrysoteuchia*****,** from in the style of Chryses, high priest of Apollo and warrior in the Trojan Wars who tried to ransom his daughter with gold, describing the strongly gold cilia of the forewing and ***culmella*** from the culm or stalk of the grass.

Chrysoteuchia culmella is a species of micro-moth of the family Crambidae with one generation per year flying mainly in June and July (Fig 12).

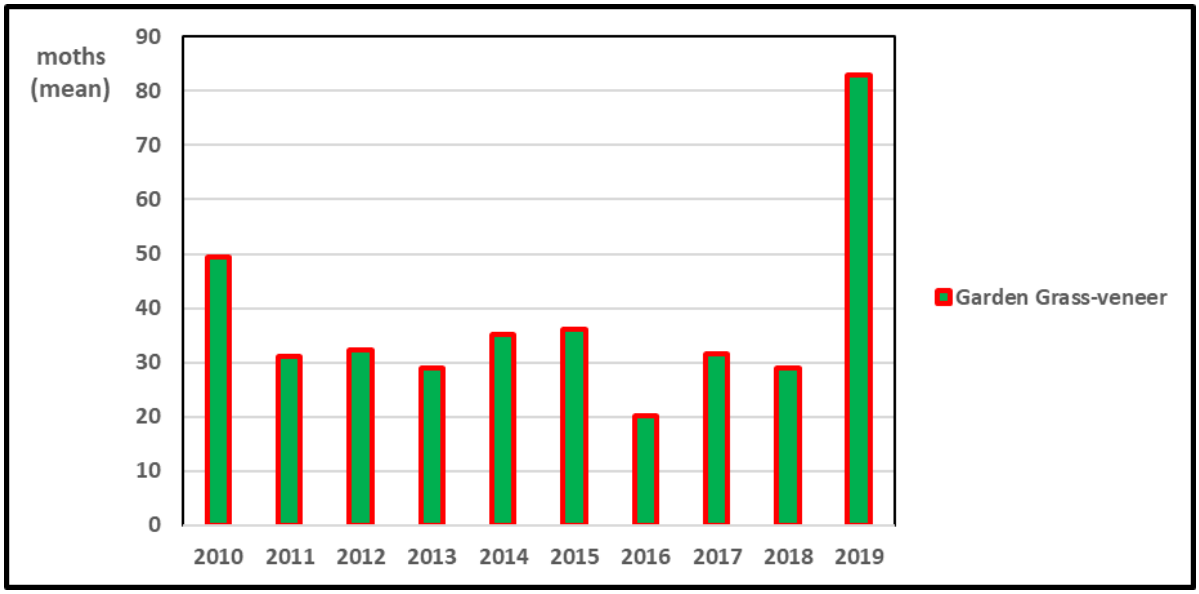
Fig 12. GMS 2010 - 2019 Q3. Garden Grass-veneer Flight Times



It is easily recognised by the “C” shaped outer cross-line (C for culmella) and its uniform metallic golden fringe. It rests head down on grass stalks and is easily disturbed by day. It is often abundant and comes to light. The larvae feed at the base of grass stems.

Compared to previous years this quarter has been a bumper one for this moth (fig 13) with clouds of them rising in front of you. Maximum numbers caught by recorders in one session range from 12 in the Channel Islands to 600 in Yorkshire and Humberside.

Fig 13. GMS 2010 - 2019 Q3. Mean Quarterly Numbers of *Chrysoteuchia culmella*



Nice Moths in Aberdeenshire – Mary Laing

This is my fifth year of moth trapping and I'm still learning new words! First it was "frass" and "instars" when raising caterpillars, then "spiracles" and now "univoltine" and "bivoltine", though the last one doesn't appear in my Chambers Dictionary! One is never too old to learn new words, I have found.

Bedstraw Hawk-moth

I have also found some new species for my garden this year, including a Bedstraw Hawk-moth and a Chocolate-tip. I had thought that the Bedstraw Hawk-moth on the 31st July would be my greatest excitement, but I hadn't counted on the Chocolate-tip on the 25th of August. The latter had been on my "Garden Moth Wish List", though it was thought unlikely. In England the Chocolate-tip is bivoltine; however in Scotland it is univoltine, generally recorded in June. There are only two known places in Scotland where it exists, one apparently at Foyers, near Loch Ness (which site hasn't been revisited since 1984), and the other being at Dinnet, Aberdeenshire, restricted to the aspen woods near Loch Kinord, which is a mile from my house. It has only ever been recorded at Dinnet in June, but this year when it was searched for then, it was without success. There is speculation now that it may be changing from univoltine to bivoltine, due perhaps to climate change, or that maybe there were always a few late individuals which were overlooked. In any case, it shows how regular trapping by amateurs like me can be interesting to the experts.

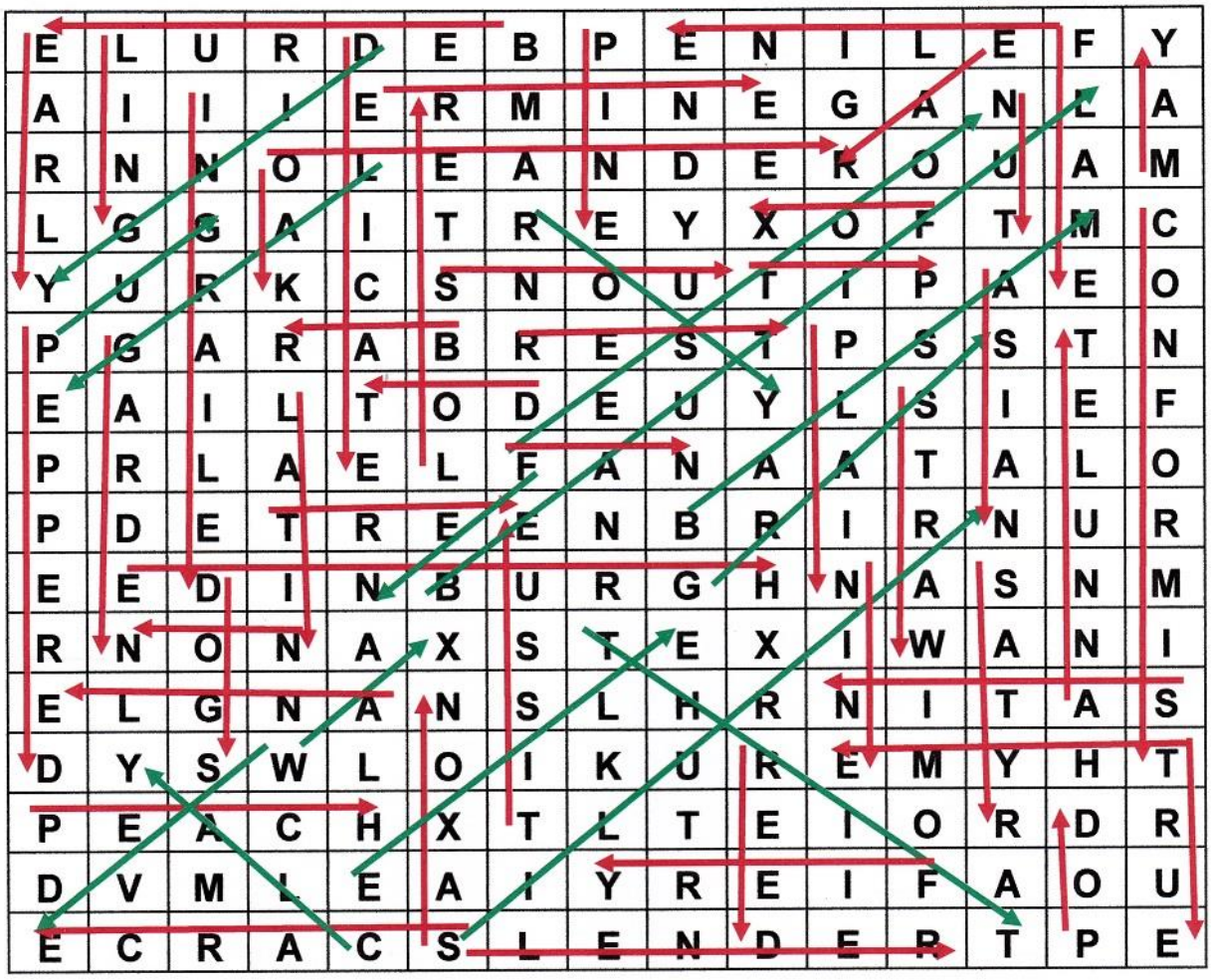
Chocolate-tip

A long way from home – Andy Newbold

I have been running a moth trap now for nearly five years in my garden in Sibford Ferris. The village is located on the North-West edge of Oxfordshire only about a mile from the Warwickshire border. It is about as far from the coast as it is possible to be in the UK and as a result, migrants are pretty rare. However, 2019 has resulted in some unexpected moths turning up. Although not GMS moths or necessarily on GMS nights some of the warmer nights this year have resulted in me recording some species wandering a long way from home. These have included Silver Cloud (22nd April), Satin Lutestring (25th July) and, perhaps most surprisingly, Crescent Dart (25th July). All three species are firsts for Oxfordshire and more typical of the South and West of the country. More recently I also recorded a Dark Crimson Underwing (25th August) and two Clifden Nonpareil (20th and 22nd September).

Crescent Dart

Word Search Answers - Nonconformist



Horizontal	Vertical	Diagonal
Angle	Annulet	Balsam
Bar	Asian	Beautiful
Bedrule	Conformist	Clay
Dot	Delicate	Dingy
Edinburgh	Dog's	Ear
Ermine	Early	Exile
Fan	Flame	Fen
Feline	Garden	Festoon
Fiery	ingrailed	Grass
Fox	Latin	Large
Non	Ling	Pug
Oleander	May	Rosy
Peach	Nine	Silurian
Rest	Nut	Thrift
Satin	Oak	Wave
Scarce	Peppered	Wax
Slender	Pine	
Snout	Plain	
Thyme	Pod	
Tip	Reed	
Tree	Satyr	
	Saxon	
	Straw	
	Tissue	
	T rue	

Tailpiece – Norman Lowe

So how many of you have seen the Moth Night target species Clifden Nonpareil this year? In my remote county of Breconshire it still hasn't been recorded so if you want to be one up on me, let me know. The usual address is norman@enviro-consulting.com and of course I welcome contributions of any length on any subject.

Communications & Links.

GMS Website - http://www.gardenmoths.org.uk/ - the Communications section gives information on the regional coordinators; the Downloads section provides access to Identification Guides, Annual Reports and Newsletters, as well as all the regional recording forms and instructions.

Facebook Page - https://www.facebook.com/GardenMothScheme - we now have over 1300 'Likes'!

Facebook Group - https://www.facebook.com/groups/438806469608527/ - currently with more than 2200 Members (not all active GMS participants) – open membership – all recording forms, instructions and micro-moth identification guides are available in the Files section

Mike Cook has created a linked Facebook group called 'GMS Moth ID Help' specifically for helping members with identification queries. We are trialling this to see if it will help with getting everyone's ID queries dealt with promptly. It can be found at https://m.facebook.com/groups/689678498210657

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