
HD

1
00:00:04,710 --> 00:00:02,790
the station crew has been wrapping up a

2
00:00:07,030 --> 00:00:04,720
hardware validation test this week

3
00:00:08,870 --> 00:00:07,040
called veggie harvesting the lettuce

4
00:00:10,390 --> 00:00:08,880
plants from a compact greenhouse that

5
00:00:12,230 --> 00:00:10,400
was flown to the station to demonstrate

6
00:00:14,310 --> 00:00:12,240
its potential use as a way to supply

7
00:00:16,550 --> 00:00:14,320
fresh food to astronauts on long

8
00:00:18,550 --> 00:00:16,560
duration space flights today we have a

9
00:00:20,390 --> 00:00:18,560
chance to get an early report on how

10
00:00:22,230 --> 00:00:20,400
that has been going and we have joining

11
00:00:25,670 --> 00:00:22,240
us from the kennedy space center in

12
00:00:27,509 --> 00:00:25,680
florida dr joya masa the science team

13
00:00:31,429 --> 00:00:27,519

lead for the veggie hardware validation

14
00:00:33,590 --> 00:00:31,439
test thanks so much for joining us julia

15
00:00:35,350 --> 00:00:33,600
thanks for inviting me brandi

16
00:00:37,430 --> 00:00:35,360
well why don't we start off by letting

17
00:00:39,430 --> 00:00:37,440
you kind of remind us exactly what this

18
00:00:43,190 --> 00:00:39,440
experiment is about what what what the

19
00:00:49,590 --> 00:00:46,229
sure well veggie is a new plant growth

20
00:00:52,950 --> 00:00:49,600
chamber that we just sent up on space x3

21
00:00:55,110 --> 00:00:52,960
so for the first test we wanted to just

22
00:00:57,350 --> 00:00:55,120
validate that the chamber would

23
00:00:58,709 --> 00:00:57,360
successfully grow plants and that all

24
00:00:59,830 --> 00:00:58,719
the systems

25
00:01:03,750 --> 00:00:59,840
worked well

26
00:01:06,230 --> 00:01:03,760
and so to do that we selected outregis

27
00:01:07,830 --> 00:01:06,240
red romaine lettuce as our first test

28
00:01:09,429 --> 00:01:07,840
crop

29
00:01:11,270 --> 00:01:09,439
okay well that sounds exciting how's

30
00:01:13,510 --> 00:01:11,280
this different from

31
00:01:14,789 --> 00:01:13,520
other plants grown on in space and

32
00:01:18,550 --> 00:01:14,799
different

33
00:01:22,469 --> 00:01:20,630
well veggie is one of the largest plant

34
00:01:25,270 --> 00:01:22,479
growth chambers ever in space the

35
00:01:28,870 --> 00:01:25,280
largest that nasa has so far

36
00:01:32,310 --> 00:01:28,880
and it's designed to be really um

37
00:01:35,030 --> 00:01:32,320
open for the crew to see and to interact

38
00:01:37,350 --> 00:01:35,040

with easily so instead of being in a

39
00:01:39,990 --> 00:01:37,360
closed box with the door

40
00:01:42,550 --> 00:01:40,000
the chamber has transparent

41
00:01:45,190 --> 00:01:42,560
collapsible and expandable bellows and

42
00:01:47,350 --> 00:01:45,200
so the crew can just you know float by

43
00:01:48,870 --> 00:01:47,360
and see the plants growing in there

44
00:01:52,230 --> 00:01:48,880
it also has

45
00:01:55,030 --> 00:01:52,240
led lights and we used red blue and

46
00:01:56,789 --> 00:01:55,040
green led lights in the veggie the red

47
00:01:58,870 --> 00:01:56,799
and blue lights are really for plant

48
00:02:00,469 --> 00:01:58,880
growth and the green led lights are for

49
00:02:02,630 --> 00:02:00,479
the humans to make the plants look a

50
00:02:04,469 --> 00:02:02,640
little more like plants

51
00:02:06,310 --> 00:02:04,479
so if you've seen shots of the columbus

52
00:02:08,469 --> 00:02:06,320
module lately you'll see this kind of

53
00:02:11,350 --> 00:02:08,479
purplish glow in there and that's the

54
00:02:13,030 --> 00:02:11,360
veggie chamber on and it seems like the

55
00:02:15,110 --> 00:02:13,040
astronauts and cosmonauts have kind of

56
00:02:16,150 --> 00:02:15,120
enjoyed taking pictures of the purple

57
00:02:17,830 --> 00:02:16,160
light

58
00:02:19,910 --> 00:02:17,840
in fact i think we actually have some

59
00:02:21,430 --> 00:02:19,920
video of steve swanson working to

60
00:02:23,430 --> 00:02:21,440
harvest some of that

61
00:02:24,710 --> 00:02:23,440
some of that lettuce that we can

62
00:02:26,470 --> 00:02:24,720
take a look at

63
00:02:29,750 --> 00:02:26,480

do you have any idea how that how that's

64
00:02:34,630 --> 00:02:32,070
well we have a little bit of an idea

65
00:02:35,830 --> 00:02:34,640
so we had six what we call plant pillows

66
00:02:38,470 --> 00:02:35,840
in there

67
00:02:41,030 --> 00:02:38,480
you can see steve here harvesting

68
00:02:44,070 --> 00:02:41,040
one of the plants and holding it up

69
00:02:46,550 --> 00:02:44,080
the plants that grew grew really well

70
00:02:47,990 --> 00:02:46,560
we had one plant pillow that did not

71
00:02:49,350 --> 00:02:48,000
germinate so we're going to bring that

72
00:02:51,350 --> 00:02:49,360
one back and try and figure out what

73
00:02:53,110 --> 00:02:51,360
went wrong and here you see a great shot

74
00:02:55,110 --> 00:02:53,120
of the lettuce it just

75
00:02:57,190 --> 00:02:55,120
looked beautiful

76
00:03:00,710 --> 00:02:57,200
when he harvests it we have him wrap it

77
00:03:02,550 --> 00:03:00,720
in foil and we're not allowing the crew

78
00:03:04,390 --> 00:03:02,560
to eat the plants at this time because

79
00:03:06,229 --> 00:03:04,400
we really need to bring them back and

80
00:03:07,430 --> 00:03:06,239
make sure that they're safe to eat and

81
00:03:10,390 --> 00:03:07,440
that nothing

82
00:03:13,509 --> 00:03:10,400
odd happened we had a little bit of an

83
00:03:15,030 --> 00:03:13,519
issue early on with some of the water

84
00:03:16,550 --> 00:03:15,040
getting to the plants that we weren't

85
00:03:19,030 --> 00:03:16,560
getting quite enough water to some of

86
00:03:21,110 --> 00:03:19,040
the plants so a couple of the plants

87
00:03:22,949 --> 00:03:21,120
didn't make it but the three plants that

88
00:03:25,110 --> 00:03:22,959

grew grew excessively well and they kind

89
00:03:26,710 --> 00:03:25,120
of filled up the rest of the space as

90
00:03:29,830 --> 00:03:26,720
you could see yeah they look just like

91
00:03:30,550 --> 00:03:29,840
what i would expect lettuce to look like

92
00:03:32,630 --> 00:03:30,560
well

93
00:03:37,589 --> 00:03:32,640
so once you do get them back to down on

94
00:03:42,229 --> 00:03:39,910
well we have a couple of different

95
00:03:45,509 --> 00:03:42,239
samples that were taken

96
00:03:47,830 --> 00:03:45,519
the crew actually swabbed the leaves and

97
00:03:49,430 --> 00:03:47,840
the surfaces of veggie to look for

98
00:03:52,070 --> 00:03:49,440
microbial

99
00:03:53,910 --> 00:03:52,080
growth on the leaves and on the surfaces

100
00:03:56,229 --> 00:03:53,920
and we're also getting those frozen

101
00:03:59,270 --> 00:03:56,239
plant backs plants back so we'll do

102
00:04:01,670 --> 00:03:59,280
microbial sampling of those plants we're

103
00:04:04,390 --> 00:04:01,680
also going to sample the plant tissue

104
00:04:06,390 --> 00:04:04,400
and look at antioxidant content and

105
00:04:07,830 --> 00:04:06,400
mineral content within the plants we

106
00:04:10,070 --> 00:04:07,840
want to know

107
00:04:11,990 --> 00:04:10,080
you know how nutritious these plants

108
00:04:13,509 --> 00:04:12,000
would be for the crew when they are

109
00:04:14,550 --> 00:04:13,519
allowed to eat them

110
00:04:16,710 --> 00:04:14,560
and

111
00:04:18,550 --> 00:04:16,720
the microbial side of things is really

112
00:04:21,349 --> 00:04:18,560
aimed towards the food safety you know

113
00:04:23,110 --> 00:04:21,359

we think they're probably perfectly safe

114
00:04:25,110 --> 00:04:23,120
but we need to confirm that and make

115
00:04:27,189 --> 00:04:25,120
sure that there aren't any

116
00:04:29,270 --> 00:04:27,199
bacteria that are up on space station

117
00:04:31,030 --> 00:04:29,280
that might have just fallen in love with

118
00:04:32,790 --> 00:04:31,040
growing all over the plants because it's

119
00:04:33,990 --> 00:04:32,800
not so easy to wash your vegetables in

120
00:04:36,469 --> 00:04:34,000
space

121
00:04:39,670 --> 00:04:36,479
would this be considered alien lettuce

122
00:04:42,550 --> 00:04:41,350
well it's definitely extraterrestrial

123
00:04:44,230 --> 00:04:42,560
lettuce

124
00:04:45,990 --> 00:04:44,240
well um i think

125
00:04:47,990 --> 00:04:46,000
also we're growing some of your own here

126
00:04:50,950 --> 00:04:48,000
on earth right what what will you do

127
00:04:57,110 --> 00:04:53,990
so that was our ground control and

128
00:05:00,070 --> 00:04:57,120
those plants are also sampled in exactly

129
00:05:01,350 --> 00:05:00,080
the same way that we sampled the ones on

130
00:05:04,629 --> 00:05:01,360
orbit

131
00:05:07,909 --> 00:05:04,639
they did microbial swab sampling of the

132
00:05:09,510 --> 00:05:07,919
plants and they also cut the plants and

133
00:05:13,029 --> 00:05:09,520
froze them here you can see some of the

134
00:05:15,189 --> 00:05:13,039
swab sampling of the leaf surfaces so

135
00:05:17,350 --> 00:05:15,199
this is a way to look and to just see

136
00:05:19,990 --> 00:05:17,360
you know what kind of microbial growth

137
00:05:21,590 --> 00:05:20,000
is on them so we'll be able to compare

138
00:05:23,430 --> 00:05:21,600

the plants from the ground and the

139
00:05:25,590 --> 00:05:23,440
plants that were grown on space station

140
00:05:27,270 --> 00:05:25,600
and see do we see any big differences

141
00:05:29,909 --> 00:05:27,280
between those

142
00:05:31,990 --> 00:05:29,919
in terms of populations of organisms

143
00:05:35,350 --> 00:05:32,000
types of organisms that might be on the

144
00:05:38,950 --> 00:05:35,360
leaves and also the the antioxidant and

145
00:05:41,110 --> 00:05:38,960
mineral levels within those plants

146
00:05:43,430 --> 00:05:41,120
okay well it looks like everything went

147
00:05:46,469 --> 00:05:43,440
really well would you say it all was as

148
00:05:51,590 --> 00:05:48,870
well yeah i mean the hardware performed

149
00:05:54,550 --> 00:05:51,600
really well for the most part our light

150
00:05:57,110 --> 00:05:54,560
system was worked great

151
00:06:00,150 --> 00:05:57,120
the plant pillows these little grow bags

152
00:06:02,469 --> 00:06:00,160
worked really well to

153
00:06:04,950 --> 00:06:02,479
distribute water to the growing roots

154
00:06:07,590 --> 00:06:04,960
and provide fertilizer for the plants in

155
00:06:09,350 --> 00:06:07,600
a way for the roots to to attach once we

156
00:06:11,110 --> 00:06:09,360
get a couple of the pillows back we'll

157
00:06:12,469 --> 00:06:11,120
be able to see that root growth a little

158
00:06:14,710 --> 00:06:12,479
bit better

159
00:06:16,790 --> 00:06:14,720
we did have a couple of issues keeping

160
00:06:18,390 --> 00:06:16,800
the correct amount of water to the

161
00:06:20,870 --> 00:06:18,400
plants and so that's something that

162
00:06:23,670 --> 00:06:20,880
we're going to learn from and work on to

163
00:06:25,590 --> 00:06:23,680

to fix in the future so that the plants

164
00:06:27,510 --> 00:06:25,600
get enough water all throughout their

165
00:06:29,909 --> 00:06:27,520
life cycle because that water need

166
00:06:31,590 --> 00:06:29,919
changes as the plants grow

167
00:06:33,830 --> 00:06:31,600
okay well what's the next step for this

168
00:06:36,870 --> 00:06:33,840
experiment is it done here or do you

169
00:06:42,790 --> 00:06:39,189
well we sent additional pillows up to

170
00:06:45,990 --> 00:06:42,800
space station on spacex 3 that contain

171
00:06:48,550 --> 00:06:46,000
lettuce seeds and also zinnia seeds

172
00:06:50,790 --> 00:06:48,560
zinnia is a small flower and we thought

173
00:06:52,550 --> 00:06:50,800
that the crew could grow those and enjoy

174
00:06:55,029 --> 00:06:52,560
just having some flowers around without

175
00:06:56,790 --> 00:06:55,039
being tempted to eat them

176
00:06:58,390 --> 00:06:56,800
and then the lettuce

177
00:07:01,670 --> 00:06:58,400
would be additional

178
00:07:04,230 --> 00:07:01,680
data for our food safety analysis or if

179
00:07:06,469 --> 00:07:04,240
we get enough data and we get those back

180
00:07:08,629 --> 00:07:06,479
maybe the crew could actually grow those

181
00:07:11,270 --> 00:07:08,639
and eat those at a later point but we we

182
00:07:13,510 --> 00:07:11,280
have to get the plant samples back first

183
00:07:14,870 --> 00:07:13,520
and we won't get those back until spacex

184
00:07:17,749 --> 00:07:14,880
4 returns

185
00:07:19,510 --> 00:07:17,759
so both those lettuce seed pillows and

186
00:07:21,830 --> 00:07:19,520
the zinnia seed pillows are going to be

187
00:07:23,830 --> 00:07:21,840
hopefully added to the voluntary science

188
00:07:25,350 --> 00:07:23,840

list and then the crew can choose

189
00:07:26,710 --> 00:07:25,360
whether or not they want to grow those

190
00:07:28,230 --> 00:07:26,720
plants

191
00:07:29,749 --> 00:07:28,240
and we think this is just the first of

192
00:07:33,350 --> 00:07:29,759
many things that will be going on in the

193
00:07:36,950 --> 00:07:35,189
okay well we um we'll look forward to

194
00:07:38,390 --> 00:07:36,960
that hope to see some flowers growing in

195
00:07:40,150 --> 00:07:38,400
space pretty soon

196
00:07:42,070 --> 00:07:40,160
thanks so much for joining us again we

197
00:07:43,990 --> 00:07:42,080
hope so too

198
00:07:46,150 --> 00:07:44,000
thanks again this is julia massa who is

199
00:07:48,150 --> 00:07:46,160
the science team lead for the veggie

200
00:07:51,350 --> 00:07:48,160
hardware validation test thanks again